



केंद्रीय विद्यालय संगठन

एर्नाकुलम संभाग

Worksheets

SESSION 2025-26



“Go down deep enough into anything and you will find mathematics.” – Dean Schlicter

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MATHEMATICS TEXTBOOKS ORIENTATION

Patterns in Mathematics

Class VI

SECTION A

MCQ QUESTION CARRY 1 MARK EACH

1. The sequence 1,3,6,10,15.....is known as
 - a. Square
 - b. Counting numbers
 - c. Triangular numbers
 - d. Odd numbers
2. The sequence of cube is
 - a. 1,8,27,64,.....
 - b. 1,4,9,16,.....
 - c. 2,4,6,8,.....
 - d. 1,3,5,7
3. _____ is both a triangular number and a square number
 - a. 25
 - b. 36
 - c. 8
 - d. 4
4. How many sides does a hexagonal have
 - a. 5
 - b. 4
 - c. 6
 - d. 3
5. Virahanka numbers are
 - a. 1,3,6,10,15,.....
 - b. 1,2,3,5,8,.....
 - c. 1,8,27,64,125,.....
 - d. 1,7,19,37,.....
6. Which of the following is a triangular number
 - a. 5
 - b. 12
 - c. 21
 - d. 16
7. Which of the following is an example of a shape sequence
 - a. Regular polygon
 - b. Adding odd numbers to get square number
 - c. Adding counting numbers up and down
 - d. None of the above
8. Which visual representation technique used to understand number sequence in mathematics
 - a. tables
 - b. graphs
 - c. pictures
 - d. equations
9. The sequence of 1,2,4,8,16,.....are
 - a. powers of 2
 - b. squares
 - c. cubes
 - d. counting numbers
10. The sum of first five odd numbers is

- a. 16 b. 25 c. 9 d. 36

SECTION B (2 marks)

1. Replace the variables with the given number and evaluate
 - a. $2h$, $h = 7$
 - b. $n + 3$, $n = 8$
 - c. $6 + 2t$, $t = 4$
 - d. $4p$, $p = 3$
2. Observe the patterns and write the pattern rules
 - a. 36, 44, 50, 56,
 - b. 2000, 200, 20, 2, ...
3. Use the pattern rule to make the pattern. Write first five term
 - a. Start with 18 and subtract 3 each time
 - b. Start at 63 and divide by 7 each time
4. John says he made a pattern by starting at 7 and adding 5 each time. Write the first three terms of John's pattern
5. Can you recognize the pattern in each of the sequence in following
 - a. 1, 4, 9, 16, 25, 36
 - b. 1, 2, 4, 8, 16, 32, 64
 - c. 1, 3, 6, 10, 15, 21, 28
 - d. 1, 2, 3, 5, 8, 13, 21

SECTION C (3 marks)

1. Identify the appropriate rule for the given sequence
 - a. 5, 10, 15, 20,
 - b. 2, 6, 10, 14,
 - c. 16, 14, 14, 10,
2. What are the next two terms in the sequences
 - a. 3, 6, 9, 12, _____
 - b. 20, 19, 18, 17, _____
 - c. 3, 8, 13, 18, _____
3. Give the pictorial representation of the number sequence 3, 6, 9, 12
4. Identify the polygon according to the number of sides
 - a. 3-
 - b. 5-
 - c. 6-

5. Imagine you are filling a jar with marbles. Each time you add 3 more marbles than before. If you start with 2 marbles how many marbles will you have after 5 rounds?

SECTION D (case study)

1. Rahul is designing a staircase for his house. To ensure safety and comfort every step must have the same vertical height (called rise). He decides that each step will have a rise of 18cm.

- What is the height above the ground of the 10th step?
- Write a general rule for finding the height above the ground of the n th step
- If the staircase has 15 steps, what is the total vertical height from the ground to the top step?
- If the total vertical rise required is 216 cm, how many steps does the staircase have?

2. A shape museum exhibit displays a sequence of shapes as follows

- 1st shape – triangle- 3sides
2nd shape – square – 4 sides
3rd shape – pentagon – 5 sides
4th shape- Hexagon- 6 sides

And so

- Write a formula to determine the number of sides of the n th shape in the exhibit
- Using your formula find the number of sides in the 8th shapes
- Calculate the total number of sides for the first 5 shapes in the exhibit
- Which shape in the sequence is the first one to have 12 sides

Answers

- C- triangular numbers
- A- 1,8,27,64..
- B- 36
- C- 6
- B- 1,2,3,5,8...
- C- 21
- A- regular polygon
- C- pictures
- A- powers of 2
- B- 25

Section B (2 marks)

- a- 14, b- 11, c- 14, d- 12
- a- start at 38 add 6 each time
b- start at 2000 divide by 10 each time

3. a- 18, 15, 12, 9, 6
b- 63, 9, 1.29, 0.18, 0.03
4. 1st three term - 7,12,17
5. a -squares, b- powers of 2,
c- triangular numbers, d- virahanka numbers

Section C (3 marks)

1. a- add 5 to the previous number to get the next number
b- add 4 to the previous number to get the next number
c- subtract 2 from the previous number to get the next number
2. a- 15, 18 b- 16,15. c- 23, 28
3. Give any pictorial representation
4. Triangle, pentagon, hexagon
5. The sequence is 2,5,8,11,14
Total after 5 rounds - $2+5+8+11+14 = 40$

Section D (case study)

1.
 - a. $10 \times 18 = 180\text{cm}$
 - b. height = $n \times 18\text{cm}$
 - c. $15 \times 18 = 270\text{cm}$
 - d. $216 \div 18 = 12$ steps
2.
 - a. No: of sides = $n+2$
 - b. 8th shape $n=8$
No: of sides = $n+2 = 10$ sides
 - c. 25 sides
 - d. $n+2 = 12$
 $n = 12 - 2 = 10$

This the 10 th shape is the first to have 12 sides.

SATENDRA AHIRWAR

TGT MATH

PM SHRI KV ADOIR SHIFT1

Class 6: Maths Worksheet – Chapter 1: Patterns in Mathematics

Name: _____ **Roll No.:** _____ **Date:** _____

Max. Marks: 50 **Time:** 1 Hour

Part A: Multiple Choice Questions (MCQs) (10 $\times$ 1 Mark = 10 Marks)

Instructions: Choose the correct option for each question.

1. What is the next term in the sequence: 2, 4, 8, 16, ...?

(a) 24

(b) 30

(c) 32

(d) 36

2. The numbers 1, 4, 9, 16, 25, ... are commonly known as:

(a) Odd numbers

(b) Prime numbers

(c) Triangular numbers

(d) Square numbers

3. Which geometric shape can be formed by arranging the number of dots equal to a Triangular number?

(a) Square

* (b) Rectangle

* © Equilateral Triangle

* (d) Circle

4. Find the missing number in the sequence: **5, 10, 15, ____, 25**.

* (a) 18

* (b) 20

* © 22

* (d) 24

5. The rule for the number pattern **10, 20, 30, 40, ...** is:

* (a) Add 5

* (b) Multiply by 2

* © Add 10

* (d) Subtract 10

6. Which of the following numbers is a **Cube number**?

* (a) 8

* (b) 12

* © 16

* (d) 20

7. What is the sum of the first four **Odd numbers**? (\$1+3+5+7\$)

* (a) 10

* (b) 12

* © 14

* (d) 16

8. The next shape in the sequence $\triangle, \square, \triangle, \square, \dots$ will be:

* (a) Pentagon

* (b) Triangle

* © Circle

* (d) Square

9. Which number is both a **Square number** and a **Triangular number**? (Hint: The numbers are $1, 3, 6, 10, 15, 21, 28, 36, \dots$ and $1, 4, 9, 16, 25, 36, \dots$)

* (a) 9

* (b) 16

* © 25

* (d) 36

10. The sequence $1, 2, 3, 5, 8, 13, 21, \dots$ is called the:

* (a) Square sequence

* (b) Counting sequence

* © Fibonacci sequence (Virahāṅka numbers)

* (d) Cube sequence

Part B: Short Answer Questions (5 $\times$ 2 Marks = 10 Marks)

Instructions: Answer the following questions briefly.

1. Write the next three terms for the sequence of **Odd numbers** starting from 1: 1, 3, 5, 7, \dots
 2. Define **Square Numbers** and give two examples.
 3. Find the missing number and write the rule for the pattern: 100, 90, 80, ___, 60.
 4. If $1 = 1^2$, $1+3 = 2^2$, $1+3+5 = 3^2$, what is the sum of the first five odd numbers?
 5. Draw the dot arrangement for the **Triangular number 6**. [attachment_0](attachment)
-

Part C: Long Answer Questions (5 $\times$ 3 Marks = 15 Marks)

Instructions: Answer the following questions in detail.

1. Explain how **Triangular numbers** are generated. Write the first five Triangular numbers.
2. Observe the pattern and find the next two terms:

1

$$1 \times 8 + 1 = 9$$

$$12 \times 8 + 2 = 98$$

$$123 \times 8 + 3 = 987$$

$$1234 \times 8 + 4 = 9876$$

\dots

1

3. Examine the pattern and complete the following:

1

1

$$1 + 2 + 1 = 4$$

$$1 + 2 + 3 + 2 + 1 = 9$$

$$1 + 2 + 3 + 4 + 3 + 2 + 1 = 16$$

$$1 + 2 + 3 + 4 + 5 + 4 + 3 + 2 + 1 = ____$$

\$\$

What is the significance of the result?

4. The sequence of powers of 2 is given as: 1, 2, 4, 8, 16, 32, ... What is the rule that generates the next term? Use the rule to find the 8th term.

5. A painter is decorating a wall with tiles. He uses 1 white tile followed by 2 blue tiles, then 3 white tiles, then 4 blue tiles, and so on. If he continues this pattern, how many tiles will be in the **sixth group** (after the 5 blue tiles group)? What color will these tiles be?

Part D: Case Study Questions (2 × 7.5 Marks = 15 Marks)

Instructions: Read the following case studies and answer the questions that follow.

Case Study 1: The Staircase Pattern

A construction worker is building steps for a small staircase. He uses small square bricks for the steps.

* Step 1 uses **1** brick.

* Step 2 uses **3** bricks.

* Step 3 uses **6** bricks.

* Step 4 uses **10** bricks.

1. Identify the number sequence formed by the total number of bricks used: $1, 3, 6, 10, \dots$ (2 Marks)
2. How many bricks will be required for Step 5? (2 Marks)
3. If the number of bricks required for Step n is T_n , what is the total number of bricks needed to build a staircase with 6 steps? (3.5 Marks)

Case Study 2: Patterns in Multiplication

A student is observing the pattern in the multiplication of 9 by a sequence of ascending digits:

\$\$

$$9 \times 1 = 9$$

$$9 \times 2 = 18 \quad (1+8=9)$$

$$9 \times 3 = 27 \quad (2+7=9)$$

$$9 \times 4 = 36 \quad (3+6=9)$$

\$\$

1. Write the next three steps in this pattern: $9 \times 5, 9 \times 6, 9 \times 7$. (3 Marks)
2. What is the consistent pattern observed in the sum of the digits of the product in each step? (2 Marks)
3. If the student multiplies 9×10 , the product is 90. Does the pattern hold true for the sum of the digits of the product? Justify your answer. (2.5 Marks)

WORKSHEET

CHAPTER: PATTERNS IN MATHEMATICS

CLASS: 6

SECTION-A (Each question carries 1 mark)

1. Which sequence do we get when we add up counting numbers?
 - a) Squares
 - b) Cubes
 - c) Triangular numbers
 - d) Hexagonal numbers
2. Which visual representation technique is used to understand number sequences in Mathematics?
 - a) Tables
 - b) Graphs
 - c) Pictures
 - d) Equations
3. Which of the following is a *square number* sequence?
 - a) 1, 4, 9, 16, 25, ...
 - b) 2, 4, 8, 16, 32, ...
 - c) 3, 6, 9, 12, 15, ...
 - d) 10, 20, 30, 40, 50, ...
4. The terms in the number sequence 38, 34, 30, 26, are generated by:
 - a) adding 4 to the next term
 - b) multiplying by 4 to get the next term
 - c) subtracting 4 to get the next term
 - d) dividing by 4 to get the next term
5. Which number is missing in the pattern 120, 115, 110, __, 100, 95?
 - a) 105
 - b) 115
 - c) 90
 - d) 95
6. Start with 21 and subtract 4 from each term to get the next term. What are the first 4 terms?
 - a) 17, 13, 9, 5
 - b) 21, 17, 13, 9
 - c) 21, 16, 11, 6
 - d) 5, 9, 13, 17
7. Which rule describes this pattern? 3, 6, 9, 12, 15, ...
 - a) Add 2 each time
 - b) Add 3 each time
 - c) Multiply by 2 each time
 - d) Subtract 3 each time

8. What comes next in the pattern? 2, 4, 8, 16, ____
a) 18 b) 24
c) 30 d) 32
9. The pattern is: 1, 4, 9, 16, 25, ____ . Which statement best describes the pattern?
a) Add 2 each time b) Add odd numbers (3, 5, 7, ...)
c) Multiply by 2 each time d) Add 5 each time
10. In a number pattern, the rule is “add 5 each time.” If the first number is 7, what is the 6th term?
a) 27 b) 32
c) 37 d) 42

SECTION-B (Each question carries 2 marks)

11. Give the pictorial representation of 3, 6, 9, 12,....
12. Which sequence do you get when you start to add two consecutive even numbers minus 1?
13. What is the fourth shape in a pattern when we starts with a triangle and the number of sides increases by 1 with each shape?
14. The number pattern is increasing by +1, +2, +3, +4 ... starting from 1.
a) Write the first six terms of the pattern.
b) How much was added to reach the 6th term?
15. In a triangle pattern, the first figure has 3 triangles, the second 6, the third 9. Predict how many triangles will be in the 5th figure.

SECTION-C (Each question carries 3 marks)

16. In a pattern of matchsticks:
Figure 1 uses 4 matchsticks, Figure 2 uses 7, Figure 3 uses 10, Figure 4 uses 13, and so on.
a) Write the rule to find the number of matchsticks used.
b) How many matchsticks will Figure 8 need?
17. The following number pattern is based on triangular numbers:
1, 3, 6, 10, 15, ...
a) Write the next two terms.
b) Find the difference between consecutive terms.
c) What pattern do you notice in the differences?

18. A pattern is formed using the rule:
“Multiply the term number by 4, then subtract 1.”
a) Write the first five terms.
b) What will be the 10th term?
19. A calendar for April starts on Monday.
a) Write the dates of all Mondays.
b) What pattern do you observe in these dates?
c) If May starts on Wednesday, what will be the dates of all Wednesdays in May?
20. Create your own pattern using numbers or shapes and explain the rule.

SECTION-D (Case Study based questions)

21. Rani planted flowers in her garden in a special pattern:

In the 1st row – 2 plants,
2nd row – 4 plants,
3rd row – 8 plants,
4th row – 16 plants, and so on.



- a) How many plants will she plant in the 5th row?
b) What rule is she following?
c) How many plants in total will she have after 5 rows?
22. A pattern of houses is made with matchsticks as follows:
- 1st house– 6 matchsticks
 - 2nd house – 11 matchsticks
 - 3rd house – 16 matchsticks
- a) How many matchsticks will be used to make 4th house?
b) How many matchsticks will be needed for 5 houses?
c) Write the rule used to find the number of matchsticks.

ANSWER KEY

1. c)
2. c)

3. a)
4. c)
5. a)
6. b)
7. b)
8. d)
9. b)
10. b)

11. Do it yourself

12. $2+4-1=5$
 $4+6-1=9$
 $6+8-1=13$

.

We get the sequence 5,9,13,...

13. Triangle, quadrilateral, pentagon, hexagon

14. 1, 2, 4, 7, 11, 16,....

We added 15 to 1 to get the 6th term.

15. 3, 6, 9, 12, 15,....

There will be 15 matchsticks in the fifth figure.

16. 4, 7, 10, 13, 16, 19, 22, 25,

a) We get each term in the sequence by adding 3 to the previous term starting with 4.

b) Figure 8 needs 25 matchsticks.

17. a) 1,3,6,10,15,21,28,.....

b) $3-1=2$, $6-3=3$, $10-6=4$, $15-10=5$, $21-15=6$, $28-21=7$

c) We get the sequence of counting numbers starting with 2.

18. a) 3, 7, 11, 15, 19, 23,.....

b) 39

19. a) 1, 8, 15, 22, 29

b) Adding 7 with each term to get the next term starting with 1.

c) 1, 8, 15, 22, 29

20. Do it yourself

21. a) 32

b) Multiplying 2 with each term to get the next term starting with 2.

c) $2+4+8+16+32= 62$

22. a) 6, 11, 16, 21,

b) $6+11+16+21+26= 80$

c) Adding 5 to each term to get the next term starting with 6.

WORKSHEET PREPARED BY,

SHALINI SUNIL

TGT MATHEMATICS

PM SHRI KV RUBBER BOARD, KOTTAYAM

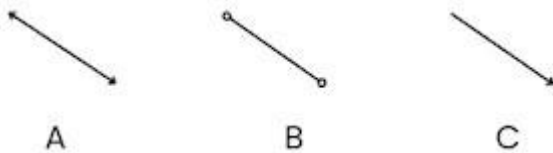
Lines and Angles

Multiple Choice Questions

1. A part of a line that has one endpoint is called a:
a) Line b) Ray c) Line segment d) Curve
2. The angle between the hour and minute hand at 12 o'clock is:
a) 180° b) 0° c) 90° d) 60°
3. The spokes of the Ashoka Chakra are symmetrically placed. The angle between any two adjacent spokes (24 spokes total) is:
a) 10° b) 15° c) 30° d) 360°
4. An angle that is less than 90° is called:
a) Right angle b) Straight angle c) Acute angle d) Obtuse angle
5. If an angle measures more than 90° but less than 180° , it is:
a) Acute b) Right c) Obtuse d) Reflex
6. The angle formed by a straight line is:
a) 90° b) 180° c) 45° d) 360°
7. A part of a line with two end points is called a:
a) Ray b) Line c) Line segment d) Angle
8. A line has:
a) Only one endpoint b) Two endpoints c) No endpoints d) Three endpoints
9. Which of these instruments is used to measure angles?
a) Divider b) Compass c) Protractor d) Ruler
10. The angle between two adjacent spokes in a 36-spoke cycle wheel is:
a) 10° b) 15° c) 20° d) 5°

Short Answer Type (2 marks)

1. Define an acute angle and give one example from daily life.
2. How many degrees are there in a full revolution? What type of angle is it?
3. Identify the Image
4. Draw angles with the following degree measures:



a. 60°

b. 45°

5. Find the angle between two adjacent spokes of a 12-spoke cycle wheel.

Long Answer Type (3 marks)

1. Draw and label the following: a line, a line segment, and a ray.
2. The minute hand of a clock moves from 12 to 5. Find the angle it covers.

3. If the angle between two adjacent spokes of a wheel is 20° , how many spokes are there in the wheel?
4. Draw an angle of 75° , then draw another angle of 120° . Label both and classify them.
5. Calculate the reflex angle made by hour hand of a clock in moving 4 hours and explain the steps.

Case Study (4 Marks)

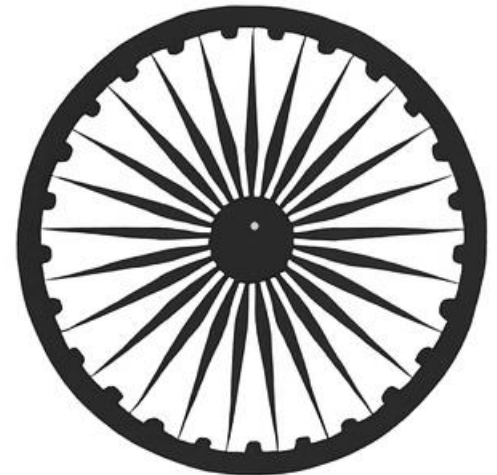
1. While staring at the old grandfather clock in Grandma's study, Leo waited for her to finish a phone call. The steady ticking was the only sound in the room. Leo noticed the time was exactly 2 O'clock and the hands formed a sharp, acute angle. It was the perfect moment to sneak out and grab a cookie.

- a) Find the measure of this angle.
- b) What type of angle is it?
- c) How will the angle change if the time is 2:30?
- d) Why do clock hands form different types of angles during the day?



2. Cycle Wheel A cycle wheel has 24 spokes arranged symmetrically.

- a) What is the angle between two adjacent spokes?
- b) What is the angle between every 6th spoke?
- c) Is the angle between every 6th spoke a right angle? Justify.
- d) How many right angles can be formed in the wheel?



Answer

Multiple Choice Questions

1. c) Line segment
2. b) 0°
3. b) 15°
4. c) Obtuse
5. c) Obtuse
6. b) 180°
7. c) Line segment
8. c) No endpoints

9. c) Protractor

10. a) 10°

Short Answer Type

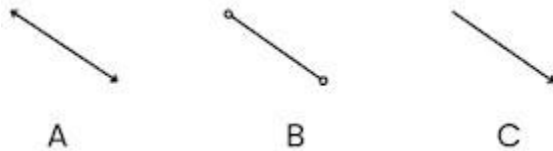
1. Acute angle: angle measure less than 90°
2. 360° , complete angle
3. A) line B) line segment C) Ray
4. Correct measure with protractor
5. Complete angle = 360°

No. of spokes = 12

$$\text{angle between two adjacent spokes} = \frac{360^\circ}{12} = 30^\circ$$

Long Answer Type

1.



2. In every 5 minute, the minute hand

subtends 30° angle

From 12 to 5, total number of minute = 25

$$\text{In 25 minute, angle made by minute hand} = 5 * 30^\circ = 150^\circ$$

3. Complete angle = 360°

$$\text{angle between two adjacent spokes} = 20^\circ$$

$$\text{No. of spokes} = \frac{360^\circ}{20^\circ} = 18$$

4. Correct measure with protractor
5. In every 1 hour, the angle made by hour hand is 30°
In 4 hours, the angle made by hour hand is $4 \times 30^\circ = 120^\circ$
Reflex angle made by hour hand in 4 hours = $360^\circ - 120^\circ = 240^\circ$

Case Study1:

- a) 60°
- b) Acute angle
- c) 105°
- d) Because of the continuous movement of the hands of a clock

Case Study2:

- a) 15°
- b) 90°
- c) yes
- d) 19

LINES AND ANGLES

MCQ (1 mark questions)

1. A straight angle measures:

- A) 45°
- B) 90°
- C) 180°
- D) 360°

2. The common endpoint of two rays forming an angle is called the:

- A) Arm
- B) Vertex
- C) Line
- D) Point

3. Two lines that do not meet even when extended infinitely in both directions are called:

- A) Intersecting lines
- B) Parallel lines
- C) Perpendicular lines
- D) Rays

4. An angle whose measure is more than 90° but less than 180° is called:

- A) Acute angle
- B) Right angle
- C) Obtuse angle
- D) Straight angle

5. If two lines intersect each other, then the number of points of intersection is:

- A) 0
- B) 1
- C) 2
- D) Infinite

6. The angles formed on the same side of a straight line are:

- A) Complementary
- B) Supplementary
- C) Equal
- D) Right

7. Angles whose sum is 90° are called:

- A) Complementary angles
- B) Supplementary angles
- C) Adjacent angles
- D) Vertically opposite angles

8. If two angles are equal and their sum is 180° , each angle is:

- A) 45°
- B) 60°
- C) 90°
- D) 120°

9. The measure of a right angle is:

- A) 45°
- B) 60°
- C) 90°
- D) 180°

10. When two lines intersect, the opposite angles formed are called:

- A) Complementary angles
- B) Adjacent angles
- C) Vertically opposite angles
- D) Alternate angles

SHORT ANSWER (2 mark questions)

11. How many lines can pass through a given point, and how many can pass through two distinct points?

12. Explain why an angle cannot be labelled with a single letter when multiple angles share a common vertex.

13. What fraction of a clockwise revolution does the hour hand of a clock turn through, when it goes from

- (i) 3 to 9
- (ii) 6 to 3

14. Which direction will you face if you start facing ?

(i) East and make $\frac{1}{2}$ of a revolution clockwise?

(ii) West and make $\frac{3}{4}$ of a revolution anti – clockwise ?

15. Which of the following are models for perpendicular lines :

(i) The adjacent edges of a page of a notebook

(ii) The line segment forming the letter T

(iii) The opposite sides of a table top

(iv) The letter X

LONG ANSWER TYPE (3 MARK QUESTIONS)

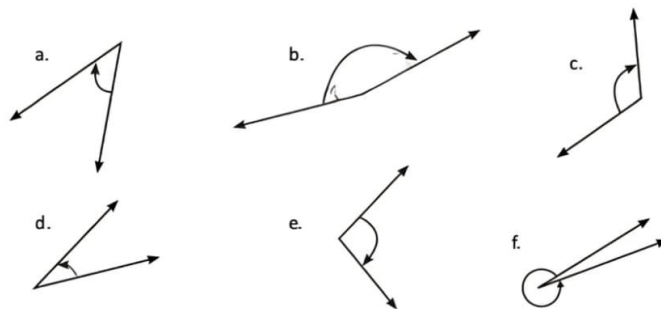
16. Draw a rough figure and label suitably in each of the following cases:

(i) point A on line segment PQ

(ii) lines AB and XY intersect at O

(iii) lines PQ and PR meet at P

17. Estimate size of each angle and measure it with a protractor



18. Draw angles of the following measures :

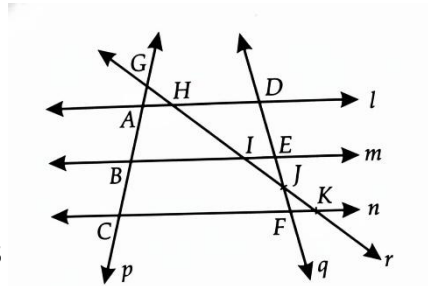
(i) 50° (ii) 125° (iii) 74°

19. Where will the hands of a clock stop if it

- (i) starts at 6 and makes $\frac{1}{2}$ of revolution clockwise ?
- (ii) starts at 3 and makes $\frac{1}{2}$ of a revolution anticlockwise ?
- (iii) starts at 6 and makes $\frac{1}{4}$ of a revolution anticlockwise ?

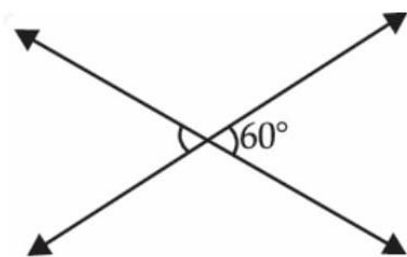
20. Write :

- i) All pairs of intersecting lines
- ii) All pairs of parallel lines
- iii) Lines whose point of intersection is
- iv) Lines whose points of intersection is A



CASE STUDY QUESTIONS (4 MARK QUESTIONS)

21. In a geometry lesson , a student was working with a pair of intersecting lines . The student found that one of the angles formed was 60° .The teacher explained that at the intersection , there are pairs of equal angles and supplementary angles that add upto 180°



1. What is the measure of the angle directly opposite the 60° angle ?
 - a) 30°
 - b) 60°
 - c) 90°
 - d) 120°

2. If one angle is 60° , what is the measure of the angle adjacent to it on the same straight line ?

- a) 30°
- b) 60°
- c) 90°
- d) 120°

3. The teacher mentioned that angles that add up to 180° are called supplementary.
If one angle is 60° , what is the measure of its supplementary angle ?

- a) 30°
- b) 60°
- c) 90°
- d) 120°

4. What is the supplementary angle of 40° ?

- a) 40°
- b) 50°
- c) 180°
- d) 140°

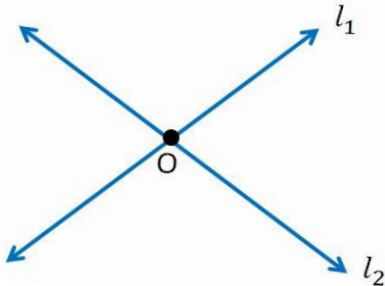
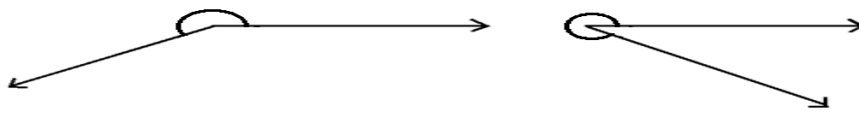
22. THE BICYCLE WHEEL

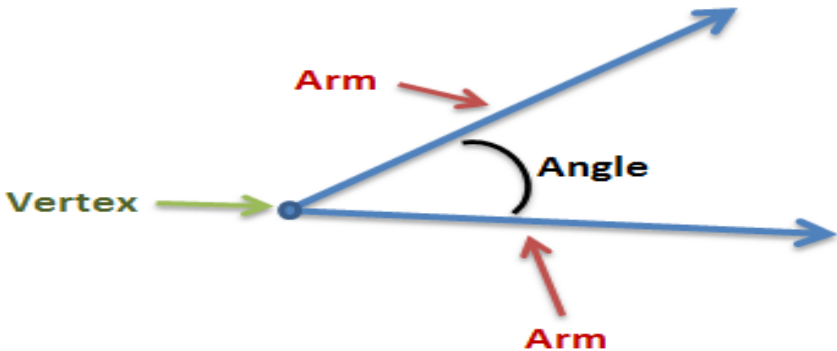
Spokes of a bicycle wheel meets at the centre forming equal angles.

There are 6 spokes in the wheel

- i) What is the total angle around the centre of the wheel?
- ii) Find the measure of each angle formed by 2 consecutive spokes ?
- iii) If there were 8 spokes , what would each angle measure ?

PM SHRI KV INS DRONACHRYA ,KOCHI		
TEACHER NAME : <i>SHUBHAM KUMAR (TGT MATHS)</i>		
WORKSHEET- LINES AND ANGLES		
CLASS- VI		SUBJECT: MATHS
MM: 40		TIME: 1 HRS
General Instructions: 1. This Question Paper has 4 Sections A, B, C, and D. 2. Section A has 10 MCQs carrying 1 mark each . 3. Section B has 5 questions carrying 02 marks each. 4. Section C has 5 questions carrying 03 marks each. 5. Section D has 2 questions carrying $2\frac{1}{2}$ marks each. 6. Draw neat figures wherever required.		
Q	SECTION A ($10 \times 1 = 10M$)	M
1	A part of a line having two endpoints is called: a) Line b) Ray c) Line Segment d) Angle	1
2	Two rays meeting at a common point form a/an: a)Point b) Line c) Angle d) Segment	1
3	The measure of a right angle is: a)45° b) 90° c) 180° d) 360°	1
4	How many lines can pass through a single point?  a)Only 1 b) 2 c) 3 d) Infinitely many	1
5	A straight angle measures: a)180° b) 90° c) 0° d) 360°	1
6	An angle whose measure is less than 90° is called: a) Right angle b) Acute angle c) Obtuse angle d) Reflex angle	1
7	The symbol of angle is: a)∠ b) ° c) → d) ∞	1
8	Two lines that meet each other are called:	1

	 a) Parallel lines b) Intersecting lines c) Perpendicular lines d) Equal lines	
9	Which of these is an example of a ray? a) Door frame b) Sunlight c) Ruler d) Paper edge	1
10	An angle greater than 180° but less than 360° is called:  a) Acute b) Reflex c) Right d) Straight	1
SECTION: B ($5 \times 2 = 10M$)		
11	Define a line segment. Give one real-life example.	2
12	What is the difference between a line and a ray?	2
13	Name any three objects from daily life where you see angles.	2
14	Can two line segments form an angle? Explain with reason.	2
15	Draw and label an acute angle. Mark its arms and vertex.	2
SECTION: C ($5 \times 3 = 15M$)		
16	Draw and name: a) One acute angle b) One right angle c) One obtuse angle	3
17	Write the degree range of acute, right, obtuse and straight angles	3
18	If $\angle ABC = 40^\circ$ and $\angle CBD = 50^\circ$, find $\angle ABD$. Draw a figure also.	3
19	Riya says "If the length of arms increases, the angle also becomes bigger." Is she correct? Explain.	3

		
20	Draw two intersecting lines AB and CD. Name all the angles formed.	3
SECTION: D ($2 \times 2.5 = 5M$)		
21	<u>CASE STUDY -1</u> A door is closed (0°). When it opens halfway, it makes a right angle. When it is fully open, it lies in a straight line ,  Read the following information carefully and answer the questions that follow. a) Which type of angle is formed when the door is half open? [1M] b) What is the angle formed when the door is fully open? What is it called? [1.5M]	2.5
22	<u>CASE STUDY-2</u> In the school assembly ground, a vertical flag post stands on a straight ground line. A rope is tied from the top of the flag post to a point on the ground a little away from the post.	2.5



Read the following information carefully and answer the questions that follow.

- a) What is the relation between the ground line and the flag post?[1M]
- b) What kind of line is represented by the rope, and how is it different from the flag post and the ground line?[1.5M]

ANSWERS

SECTION A — MCQs

1. (c) Line Segment
2. (c) Angle
3. (b) 90°
4. (d) Infinitely many
5. (a) 180°
6. (b) Acute angle
7. (a) $\angle$
8. (b) Intersecting lines
9. (b) Sunlight
10. (b) Reflex

SECTION B

11. Define a line segment. Give one example.

A line segment is a part of a line that has two fixed endpoints.

Example: Edge of a ruler or book.

12. Difference between line and ray.

Line: Extends endlessly in both directions.

Ray: Has one fixed starting point and extends endlessly in one direction.

13. Three daily life examples of angles.

Clock hands, open door, scissors, book corner, roof of a house.

14. Can two line segments form an angle? Explain.

Yes, if two line segments meet at one common point and open in two directions, they form an angle.

15. Draw and label an acute angle.

(Students must draw an angle less than 90° and label vertex & arms.)

SECTION C

16. Draw and name:

(a) Acute angle

(b) Right angle

(c) Obtuse angle

(Students should draw and label properly.)

17. Write degree ranges of angles:

Acute: $0^\circ < \text{angle} < 90^\circ$

Right: exactly 90°

Obtuse: $90^\circ < \text{angle} < 180^\circ$

Straight: exactly 180°

18. If $\angle ABC = 40^\circ$ and $\angle CBD = 50^\circ$, find $\angle ABD$.

Solution:

$$\angle ABD = \angle ABC + \angle CBD = 40^\circ + 50^\circ = 90^\circ$$

19. Riya says the angle increases if arm length increases. Is she correct?

No. Angle depends on opening between two arms, not on the length of arms.

20. Draw two intersecting lines AB and CD. Name all formed angles.

Angles formed: $\angle AOC$, $\angle COD$, $\angle DOB$, $\angle BOA$ (all around intersection point).

SECTION D — Case Studies

21. Case Study – Door

(a) What angle is formed when the door is half open?

Answer: Right angle (90°)

(b) What angle is formed when fully open?

Answer: Straight angle (180°)

22. Case Study – Flag post and rope

(a) What is the relation between flag post and ground?

Answer: They are perpendicular (make a 90° angle).

(b) What type of line is the rope?

Answer: Slanting/oblique line — neither horizontal nor vertical.

Class 6 Mathematics – Lines and Angles

A. Multiple Choice Questions (1 mark each)

1. The common point where two lines meet is called —

Answer: Angle

2. The measure of a straight angle is —

Answer: 180°

3. Two lines that never meet are —

Answer: Parallel lines

4. An angle greater than 90° but less than 180° is —

Answer: Obtuse angle

5. Vertically opposite angles are always —

Answer: Equal

6. A park has two straight walking paths crossing each other. One angle formed is 60° . Find the measure of the opposite angle.

Answer: 60°

7. A carpenter cuts two planks so that they make a right angle. What is the measure?

Answer: 90°

8. The hands of a clock make which type of angle at 12:30?

Answer: Obtuse angle

9. If two angles are complementary and one measures 65° , find the other.

Answer: 25°

10. Renu says 110° and 70° are supplementary. Is she correct?

Answer: Yes, $110^\circ + 70^\circ = 180^\circ$

B. Two Mark Questions

1. Define a right angle and give one real-life example.

Answer: A right angle measures 90° ; example: corner of a book.

2. What are adjacent angles?

Answer: Two angles with a common vertex and arm but no common interior points.

3. Write the relation between complementary and supplementary angles.

Answer: Complementary $\rightarrow 90^\circ$; Supplementary $\rightarrow 180^\circ$.

4. A road crosses another making an angle of 120° . What type of angle is it and what is its supplement?

Answer: Obtuse angle; Supplement = 60° .

5. Two sticks cross each other at 90° . What kind of lines are they?

Answer: Perpendicular lines.

C. Three Mark Questions

1. If two lines intersect and one angle is 70° , find the remaining three angles.

Answer: Vertically opposite angle = 70° , adjacent = 110° , 110° .

2. Two complementary angles are in the ratio 2:3. Find their measures.

Answer: $2x + 3x = 90^\circ \Rightarrow x = 18^\circ \Rightarrow \text{Angles} = 36^\circ, 54^\circ$.

3. In a playground, two tracks intersect at a right angle. What angle do their paths make?

Answer: Right angle, 90° .

4. A ladder makes 60° with the ground. What type of angle is it? Find its complement.

Answer: Acute; complement = 30° .

5. A pair of scissors is open such that each blade forms 45° with the middle line. Find the total angle.

Answer: Total angle = 90° (Right angle).

D. Case Study Questions (CBQ – 4 marks each)

Case Study 1: Meena designs a paper kite with two sticks crossing at the center forming four equal angles.

Answer: 1. Sum of angles = 360°

2. Each = 90°

3. Type = Right angles

Case Study 2: At a traffic junction, two roads cross each other forming an 'X'. The acute angle is 60° .

Answer: 1. Obtuse angle = 120°

2. Sum of all = 360°

3. Roads are Intersecting lines

Prepared by Navya are Suresh

NUMBER PLAY (Class VI)

Multiple choice questions (1 mark each)

1. Which of the following is a palindrome number?

- a) 123 b) 142 c) 134 d) 121

2. What is the smallest 4-digit number?

- a) 999 b) 9999 c) 1000 d) 1001

3. Which of these is a perfect square?

- a) 50 b) 45 c) 36 d) 60

4. Which number is a supercell in the table below?

- a) 45 b) 67 c) 89 d) 72

5. What is the sum of the digits in 345?

- a) 13 b) 15 c) 12 d) 14

6. Which number is a multiple of 9?

- a) 29 b) 30 c) 27 d) 28

7. What is the predecessor of 1000?

- a) 100 b) 999 c) 998 d) 1001

8. Which number is even?

- a) 15 b) 13 c) 21 d) 18

9. Which number is a prime number?

- a) 7 b) 9 c) 4 d) 6

10. Which number has the highest digit sum?

- a) 1234 b) 4321 c) 1111 d) 999

Very short answer questions (2 marks)

11. Find two 4-digit palindromes whose digit sums are equal.

12. Create a number using digits 1, 2, 3, and 4 such that the digit sum is a perfect square

13. Identify the supercells in the sequence: 45, 67, 89, 72, 60.

14. Write a palindrome divisible by 11.

15. Write a number that is divisible by 10 and has a digit sum of 10. Show your reasoning.

Short answer questions (3 mark)

16. Find the difference between the greatest and the least 5-digit number that can be written using the digits 6, 2, 7, 4, 3 each only once.

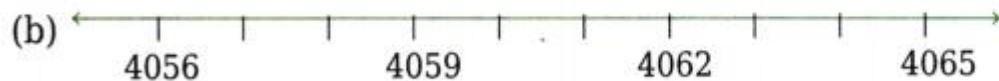
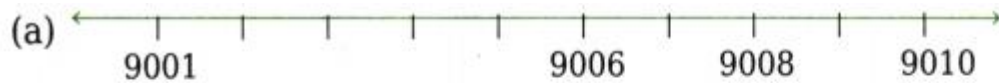
17. Read the following numbers and answer the questions below.

475320, 9847215, 97645310, 30458094 .

- (a) Which is the smallest number ?
- (b) Which is the greatest number?
- (c) Arrange these numbers in increasing order.

18. Determine the sum of the smallest and the largest five-digit palindrome number. Also calculate their difference.

19. Identify the numbers on the number lines below and label the remaining positions.



20. Form a table below such that we get as many supercells as possible. Use numbers between 90 and 100 without repetitions.

Case study questions

21. Train coaches are numbered 11, 22, 33, 44, 55.

- i) Which of these are palindrome numbers?
- ii) Which one is both palindrome and even?
- iii) What is a palindrome number

22. Ravi squares 45 and gets 2025. He splits it into 20 and 25, then adds them.

- i) What is the sum of 20 and 25?
- ii) Does this sum equal the original number?
- iii) What makes 45 a Kaprekar number?
- iv) Can you find another Kaprekar number?

CLASS VI CHAPTER 3
NUMBER PLAY

SECTION A MCQ

1. The smallest number whose digit-sum is 20 is:
A) 299 B) 389 C) 479 D) 992
2. A cell in a row of distinct numbers is called a “supercell” if it is:
A) larger than both neighbours B) equal to both neighbours
C) smaller than both neighbours D) larger than at least one neighbour
3. Which of the following is a 4-digit palindrome?
A) 1221 B) 1234 C) 1541 D) 1471
4. In a row of 7 distinct numbers, at most how many supercells can you have?
A) 2 B) 3 C) 4 D) 5
5. A palindromic time in a 12-hour clock is:
A) 11:11 B) 10:12 C) 13:31 D) 12:11
6. The smallest number in a table cannot be a supercell because:
A) It is not larger than neighbours B) It must be even
C) It must be odd D) It must be a palindrome
7. The difference between the largest and smallest 4 digit numbers formed by digits 5, 1, 9, 0 is - __
A) 8082 B) 8091 C) 8451 D) 8081
8. In Kaprekar’s routine, if all digits of a 4-digit number are the same, then after subtraction we get:
A) 0 B) 6174 C) a palindrome D) an odd number
9. When comparing two numbers on a number line, the number on the right is always:
A) Smaller B) Larger C) Equal D) Negative
10. A 3-digit number remains unchanged when reversed. What kind of number is it?
A) Prime B) Palindrome C) Even D) Supercell

SECTION B (2 marks)

11. Construct a row of seven distinct numbers so that exactly three cells are supercells.
12. List all 3-digit palindromes you can make with the digits {1, 2, 3}.
13. Take the 2-digit number 47; reverse and add it ($47 + 74 = 121$). Is 121 a palindrome? What does this suggest?
14. Estimate the sum $58,670 + 49,325$ by rounding to the nearest thousand; then compute the actual sum; compare the result.
15. On a 12-hour clock, the time now is 10:01. What are the next two palindromic times?

SECTION C (3 marks)

16.

86	67	29
81	90	56
45	88	93

Identify all supercells. Explain your reasoning.

17. You have digits $\{1, 0, 6, 3, 5\}$. Form the smallest even 5-digit number $> 50,000$ and the largest possible number. Show work.
18. Fill a 5-cell row with distinct 4-digit numbers such that: the largest number is a supercell, the second largest is *not* a supercell. Provide one valid arrangement and justify.
19. Using digits 2, 5, 8, 0, 9 form five distinct 5-digit numbers. Identify the second largest and second smallest numbers and find their difference.
20. Apply the Kaprekar routine to the number 3524: show the steps (descending, ascending, subtract) until you reach 6174 (or a fixed point).

SECTION D (CASE BASED)

21. In a game you are told: “Pick a 5-digit number and a 3-digit number such that their sum is 18,670”.

a) Is it possible that both numbers are 5-digit?

A) Yes B) No C) Only if one is 4-digit D) Only if repetitions allowed

b) One valid choice is: $18,000 + 670 = 18,670$. Which is the 3-digit number?

A) 18,000 B) 670 C) 18,670 D) 1000

c) The sum being exactly 18,670 means:

A) 5-digit + 5-digit gives a 5-digit sum B) 5-digit + 3-digit gives a 5-digit sum

C) 3-digit + 3-digit gives a 5-digit sum D) None of above

d) If you attempted 4-digit + 4-digit to reach 18,670, is it possible?

A) Yes B) No

22. Riya loves reading bus numbers and digital times on her way to school.

One day she noticed something interesting — the bus number **1221** looked the same when read backwards!

Later, she saw her school bus leave every morning at **7:07 a.m.**, and her clock at home showed the same time if turned around in a mirror.

That made her curious about *palindromic numbers* — numbers that read the same forward and backward.

She started writing more such numbers and times:

- Bus numbers: **1331, 1441, 1551**
- Digital times: **5:05, 6:06, 9:09, 10:01, 11:11**

Answer the following MCQs based on the case:

(a) Which of the following is a palindromic bus number?

A) 1234 B) 1551 C) 1324 D) 1423

(b) Which of these times is *not* a palindrome on a digital clock?

A) 7:07 B) 9:09 C) 10:11 D) 11:11

(c) Riya writes the number **2332** on paper and reverses it. What will she get?

A) 2332 B) 3232 C) 3322 D) 2323

(d) In daily life, where else can we observe palindromes?

A) Dates like 11-11-2022 B) Page numbers C) Car license plates D) All of these

ANSWER KEY **SECTION A – MCQ**

1. A) 299
2. A) larger than both neighbours
3. A) 1221
4. B) 4
5. A) 11:11
6. A) It is not larger than neighbours
7. C) 8451
8. A) 0
9. B) Larger
10. B) Palindrome

SECTION B(2 marks)

11. Example: 3, 7, 2, 8, 4, 9, 5 → Supercells = 7, 8, 9
12. 111, 121, 131, 212, 222, 232, 313, 323, 333
13. $47 + 74 = 121$ → Yes, it is a palindrome; it suggests some numbers become palindromic after reversal and addition.
14. **Estimate:** $59,000 + 49,000 = 108,000$; **Actual** = $58,670 + 49,325 = 107,995$; **estimate** $\approx$ correct.
15. After 10:01 → 10:10, 11:11.

SECTION C – (3 Marks)

16. Supercells from given list (34, 67, 29, 81, 90, 56, 45, 88, 72): 86, 90, 93
(Each is larger than both neighbours).
17. Smallest even $> 50,000$: 50,136; Largest: 65310
18. Example :

5974	4571	3420	3785	4328
------	------	------	------	------

19. With digits 2,5,8,0,9:

- Sample 5-digit numbers: 25809, 25908, 28059, 98205, 98250
- 2nd largest: 98205, 2nd smallest: 25908 → Difference = 72297.

20. Kaprekar routine for 3524:

- Descending: 5432, Ascending: 2345 → $5432 - 2345 = 3087$
- $8730 - 0378 = 8352$
- $8532 - 2358 = 6174$ → fixed point reached.

SECTION D – CASE BASED

21. (Sum = 18,670):

- a) B) No
- b) B) 670
- c) B) 5-digit + 3-digit gives a 5-digit sum
- d) B) Yes

22. (Riya and Palindromes):

- a) B) 1551
- b) C) 10:11
- c) A) 2332
- d) D) All of these

NUMBER PLAY

Choose the correct answer from the options given

1. Which of the following numbers is divisible by 5?

A. 134

B. 120

C. 132

D. 128

2. Which of the following is a prime number?

A. 21

B. 33

C. 29

D. 49

3. The HCF of 24 and 36 is:

A. 6

B. 12

C. 18

D. 24

4. The LCM of 4 and 5 is:

A. 9

B. 10

C. 15

D. 20

5. Which of the following is not a factor of 48?

A. 2

B. 4

C. 5

D. 6

6. The sum of all factors of 6 is:

A. 6

B. 10

C. 12

D. 15

7. A number is divisible by 9 if:

- A. The last digit is 9
- B. The sum of its digits is divisible by 9
- C. It ends with zero
- D. The last two digits are divisible by 9

8. The smallest composite number is:

- A. 1
- B. 2
- C. 3
- D. 4

9. Which of the following pairs are co-prime numbers?

- A. 4 and 6
- B. 3 and 5
- C. 6 and 8
- D. 9 and 12

10. The number 245 is divisible by:

- A. 2
- B. 3
- C. 5
- D. 9

Questions 11-15 carry 2 marks each

11. A box contains 126 pencils. The teacher wants to distribute them equally among students without any pencil left. For how many students can she distribute them if each group has equal number of pencils? Write any two possible numbers of students.

12. Two bells ring at intervals of 8 minutes and 12 minutes. If they ring together at 9:00 a.m., when will they ring together again?

13. Two ropes of lengths 36 m and 48 m are to be cut into equal pieces without any rope left. What is the maximum length of each piece?

14. Ravi says 8 and 15 are co-prime numbers. Do you agree? Justify your answer.

15. A number is formed by arranging the digits 2, 3, 4, 5 in any order. Find one such number that is divisible by both 2 and 5, and verify.

Questions 16-20 carry 3 marks each

16. Three traffic lights blink at intervals of 30 seconds, 45 seconds, and 60 seconds. If they blink together at 7:00:00 a.m., after how many minutes will they blink together again?

17. Two rectangular plots of lengths 42 m and 63 m are to be divided into equal square plots without any land left. Find the side of the largest possible square plot and the number of such plots formed from each.

18. Find the HCF and LCM of 36 and 48 using prime factorisation method. Verify the relationship $\text{HCF} \times \text{LCM} = \text{Product of the two numbers}$.

19. Find the smallest digit that should replace the blank in 35x2 so that the number is divisible by 3 and 5.

20. A farmer has 15 mango trees and 28 guava trees. He wants to plant them in equal rows so that each row has the same number of trees and only one type of tree. Find the maximum number of trees in each row and the number of rows for each type.

Case study questions (21-22)

21. The sports teacher of KV Ernakulam wants to divide 72 students from Class 6A and 108 students from Class 6B into equal teams for a relay race.

Each team must have the same number of students and there should be no student left out.

Q1. What is the HCF of 72 and 108?

Q2. What does this HCF represent in the context of the problem?

Q3. How many teams can be formed from each class?

22. Three buses leave a bus station at the same time.

Bus A departs every 20 minutes, Bus B every 30 minutes, and Bus C every 40 minutes.

Q1. After how many minutes will all three buses leave together again?

Q2. If the first departure is at 7:00 a.m., what will be their next common departure time?

Q3. Which mathematical concept helps to find the answer?

Answers

1. B. 120

2. C. 29

3. B. 12

4. B. 10

5. C. 5

6. B. 12

7. B. The sum of its digits is divisible by 9.

8. D. 4

9. B. 3 and 5

10. C. 5

11. Factors of 126 = 1, 2, 3, 6, 7, 9, 14, 18, 21, 42, 63, 126

Two possible numbers of students = 6 and 9 (or any other two factors except 1 and 126).

12. LCM of 8 and 12 = 24 minutes

They will ring together again after 24 minutes, i.e., at 9:24 a.m.

13. HCF of 36 and 48 = 12

Each piece can be 12 m long

14. Factors of 8 = 1, 2, 4, 8

Factors of 15 = 1, 3, 5, 15

Common factor = 1

Yes, 8 and 15 are co-prime numbers.

15. Number ending with 0 or 5 → divisible by 5

Even number → divisible by 2

Choose 2345 → ends with 5 (divisible by 5) but not by 2 → not valid

Choose 2450 (if allowed with 0) → divisible by both

16. Find LCM of 30, 45, and 60.

Prime factorisation:

$$30 = 2 \times 3 \times 5$$

$$45 = 3^2 \times 5$$

$$60 = 2^2 \times 3 \times 5$$

$$\text{LCM} = 2^2 \times 3^2 \times 5 = 180 \text{ seconds} = 3 \text{ minutes}$$

They will blink together again after 3 minutes (at 7:03:00 a.m.).

17. HCF of 42 and 63 = 21

Side of square = 21 m

$$\text{Number of plots from 42 m} = 42 \div 21 = 2$$

$$\text{Number of plots from 63 m} = 63 \div 21 = 3$$

Total plots = $2 \times 3 = 6$ square plots

$$18. 36 = 2^2 \times 3^2$$

$$48 = 2^4 \times 3$$

$$\text{HCF} = 2^2 \times 3 = 12$$

$$\text{LCM} = 2^4 \times 3^2 = 144$$

$$\text{HCF} \times \text{LCM} = 12 \times 144 = 1728$$

Product of numbers = $36 \times 48 = 1728$ Verified.

19. For divisibility by 5 $\rightarrow$ last digit should be 0 or 5 $\rightarrow$ already 2 (not divisible by 5)

If we take divisibility by 3:

$$\text{Sum of digits} = 3 + 5 + x + 2 = 10 + x$$

$10 + x$ should be divisible by 3 $\rightarrow$ possible when $x = 2, 5, 8$.

Possible values of $x = 2, 5, 8$ (divisible by 3).

If both divisibility by 3 and 5 are required, number must end in 0 or 5. So only $x = 5$ gives 3552 $\rightarrow$ ends with 2 $\rightarrow$ not divisible by 5 $\rightarrow$ hence no such number satisfies both.

20. HCF of 15 and 28 = 1

So, maximum trees in each row = 1

Rows for mango = 15, rows for guava = 28

$$21. 72 = 2^3 \times 3^2$$

$$108 = 2^2 \times 3^3$$

$$\text{HCF} = 2^2 \times 3^2 = 36$$

Each team can have 36 students.

Teams:

$$\text{Class 6A} \rightarrow 72 \div 36 = 2 \text{ teams}$$

$$\text{Class 6B} \rightarrow 108 \div 36 = 3 \text{ teams}$$

22. LCM of 20, 30, 40

$$= 2^2 \times 3 \times 5 \times 2 = 120 \text{ minutes} = 2 \text{ hours}$$

They will leave together again at 9:00 a.m.

NUMBER PLAY WORKSHEET

SECTION (A) MCQ

1. A cell in a grid is called a *supercell* when ____.
(a) It has even number (b) It is larger than all neighbouring numbers
(c) It is prime (d) It is smallest
2. In [45, 78, 92, 31, 60], the supercell is ____.
(a) 45 (b) 78 (c) 92 (d) 60
3. Which number line order is correct? 2180, 3050, 9950
(a) $9950 < 3050 < 2180$ (b) $2180 < 3050 < 9950$ (c) $3050 < 9950 < 2180$ (d) None
4. Digit sum of 68 = digit sum of ____.
(a) 176 (b) 545 (c) both a & b (d) none
5. The digit '8' occurs ____ times between 1 and 100.
(a) 10 (b) 15 (c) 20 (d) 25
6. In a 12-hour clock, the time 10:01 and 11:11 are ____.
(a) Prime times (b) Palindromic (c) Mirror times (d) Odd times
7. The difference between largest and smallest numbers formed by digits 4, 7, 3, 2 is ____.
(a) 5085 (b) 5035 (c) 5805 (d) 5508
8. If a 4-digit number is arranged in ascending and descending order and subtracted repeatedly, the result finally is ____.
(a) 3087 (b) 6174 (c) 495 (d) 9876
9. In estimation, Parmita approximates $32 + 29 + 35 \approx$ ____.
(a) 90 (b) 100 (c) 95 (d) 105
10. Which statement is *always true*?
(a) 5-digit + 5-digit = 5-digit
(b) 4-digit + 2-digit = 4-digit
(c) 5-digit + 3-digit = 6-digit
(d) None

SECTION (B) SHORT ANSWER (2 MARK)

11. Write any five numbers whose digit sum is 15.
12. Find the difference between 7432 and 2347 and explain its significance in supercell concept.

13. Show how Kaprekar's process on 6087 reaches 6174.
14. Find the digit sum pattern for consecutive 3-digit numbers (345, 456, 567). What do you observe?
15. Estimate the number of hours you spend in school per year and justify.

SECTION (C) LONG ANSWER (3 MARK)

16. Fill a 3×3 grid with numbers (100–999) so that the maximum number of cells are supercells. Explain your pattern.
17. Using digits 1, 0, 6, 3, 7 form five distinct 5-digit numbers. Find the largest and smallest numbers and their difference.
18. Draw a number line from 1000 to 10 000 and locate the numbers 2180, 3050, 5300, 8400. Explain placement.
19. Create any 3-digit Collatz sequence and show how it reaches 1.
20. Write all palindromic numbers between 1000 and 2000. Comment on any pattern you find.

SECTION (D) CASE STUDY (4 MARK)

21. Five students (Amal, Binu, Charu, Deepa, and Eshan) stand in a line of different heights. Each says the number of taller neighbours beside them:
Sequence heard — **0, 1, 2, 1, 0**.
Amal and Eshan stand at the ends.

- (a) Can either Amal or Eshan ever say “2”? Why or why not?
(b) Draw one possible arrangement of heights (tallest to shortest) that fits the sequence.
(c) Explain the reasoning pattern that connects the height order and the “taller neighbour” number.

22. Meena notices that at **12:21**, her clock looks the same forward and backward. Later she writes the date **02/02/2020**, which also reads the same both ways.

- (a) List any **three** other palindromic times on a 12-hour clock.
(b) Find **two** palindromic calendar dates in the 21st century.
(c) Why are such times and dates called *palindromic*? Can 12:22 or 03/04/2030 be palindromic? Explain.

NUMBER PLAY KEY

SECTION A – MCQs (1 mark each)

Q.No.	Question Summary	Correct Answer	Explanation
1	Definition of a supercell	(b) It is larger than all neighbouring numbers	A supercell is greater than its adjacent cells.
2	Supercell in [45, 78, 92, 31, 60]	(c) 92	92 is greater than both 78 and 31 (its neighbours).
3	Correct order on number line	(b) $2180 < 3050 < 9950$	Numbers increase from left to right.
4	Digit sum of 68 = ?	(c) both a & b	$6 + 8 = 14$; $1 + 7 + 6 = 14$; $5 + 4 + 5 = 14$.
5	Occurrence of '8' (1–100)	(c) 20	Appears in 8, 18, 28, 38, 48, 58, 68, 78, 80–89, 98.
6	10:01 and 11:11 are ____	(b) Palindromic	They read the same forwards and backwards.
7	Difference between 7432 & 2347	(a) 5085	$7432 - 2347 = 5085$.
8	Final result of Kaprekar process	(b) 6174	All 4-digit numbers reach 6174 eventually.
9	Estimate of $32 + 29 + 35$	(b) 100	Approximate: $30 + 30 + 40 = 100$.
10	Always true statement	(c) 5-digit + 3-digit = 6-digit	The sum of a 5-digit and a 3-digit number exceeds 99 999.

SECTION B – Short Answer (2 marks each)

Q.No.	Answer
11	Numbers with digit sum = 15: 78, 159, 249, 357, 606 (many possible).
12	$7432 - 2347 = \mathbf{5085}$. It shows how numbers can differ widely, similar to identifying a <i>supercell</i> that is higher than neighbours.
13	Kaprekar process for 6087: ► Descending = 8760; Ascending = 0678 → $8760 - 678 = 8082$. ► Desc = 8820; Asc = 0288 → $8820 - 288 = 8532$. ► Desc = 8532; Asc = 2358 → $8532 - 2358 = \mathbf{6174}$.
14	$345 \rightarrow 3 + 4 + 5 = 12$; $456 \rightarrow 15$; $567 \rightarrow 18$. The sum increases by 3 each time as digits increase by 1.
15	School ≈ 6 hrs/day $\times 220$ days = 1320 hours ≈ 1300 hours/year (reasonable estimate).

SECTION C – Long Answer (3 marks each)

Q.No.	Answer Summary
16	Example 3×3 grid (supercells alternate): 950, 300, 920; 250, 999, 270; 910, 200, 940. The largest number in every alternate cell ensures maximum supercells (4 cells).
17	Digits 1, 0, 6, 3, 7 → smallest = 10 367; largest = 76 310 → difference = 65 943.
18	On number line 1000–10 000: 2180 (between 2000–3000), 3050 ($\approx 1/3$ from 3000), 5300 (mid 5000 range), 8400 (near 8000–9000). Placement shows increasing intervals.
19	Example: Start = 6 → 3 → 10 → 5 → 16 → 8 → 4 → 2 → 1. Sequence ends at 1 — supports Collatz Conjecture.
20	Palindromes 1001, 1111, 1221, 1331, 1441, 1551, 1661, 1771, 1881, 1991. All read same both ways, difference between consecutive ones = 110.

SECTION D – Case Study (4 marks each)

Q21 – Height Line

- (a) No, ends (Amal & Eshan) have only one neighbour, so they can never say “2.”
 (b) Example arrangement (tallest → shortest): $C > B > D > A > E$ fits 0, 1, 2, 1, 0.
 (c) Each child’s number = count of taller neighbours beside them; symmetry gives pattern 0-1-2-1-0.

Q22 – Palindromic Clock & Calendar

- (a) Palindromic times: 01:10, 02:20, 05:50, 12:21, 11:11.
 (b) Palindromic dates: 02/02/2020, 22/02/2022 (also 11/02/2011).
 (c) They read the same backward & forward; 12:22 or 03/04/2030 are **not** palindromic because digits don’t mirror exactly.

Prepared by: KULDEEP SINGH, TGT MATHS, PM SHRI KV Kavaratti

Competencies Covered: Pattern recognition | Logical reasoning | Estimation | Problem solving | Computational thinking

Worksheet on Data Handling

Sub : Maths

Class : VI

Multiple Choice Questions (1 Mark)

1. In a tally mark table , a group of Six is represented as

- (a) ||||| | (b) V I (c) ||||| | (d) ||||| |

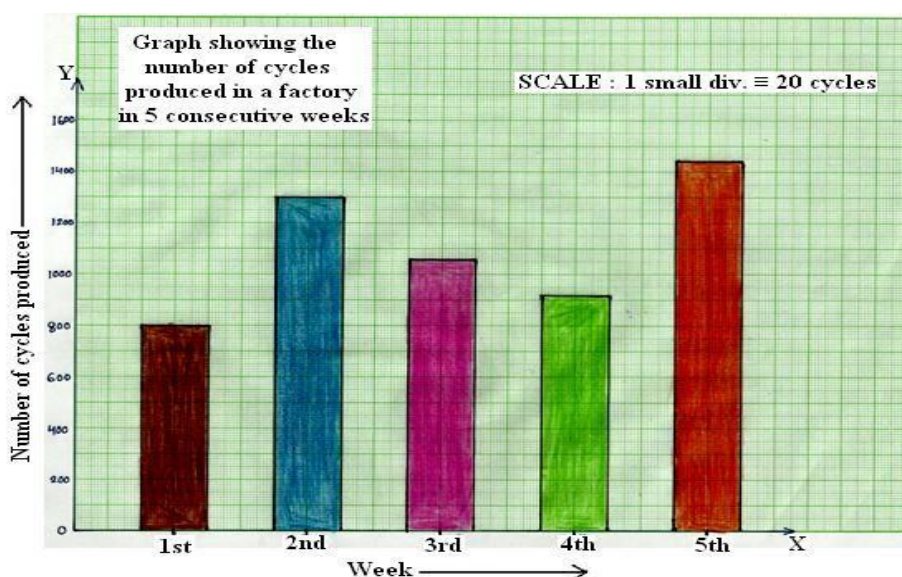
2. In a pictograph , if the picture ☺ represents 5 students , then ☺ ☺ ☺ ☺ represent

- (a) 4 students (b) 20 students (c) 40 students (d) 8 students

3. A bar graph has a scale of 1 unit length = 10 kg. A bar for the weight of a student 4 units tall is

- (a) 40 kg (b) 20 kg (c) 35 kg (d) None of these

4. The following bar graph shows the number of cycles produced in a factory in five consecutive weeks.



In which week, the production of cycles is the least ?

- (a) 1st (b) 2nd (c) 3rd (d) 4th

5. The number of students in a class is 46. A bar graph is drawn with a scale of 1 unit length = 2 students. The height of the bar for the class is

- (a) 46 units (b) 20 units (c) 23 units (d) 10 units

6. A survey was conducted on favorite sports and the number of students who like the game is written in bracket. Football(15), Cricket(20), Basketball(10), Tennis(5). How many more students prefer Cricket than Tennis?

- (a) 15 (b) 20 (c) 10 (d) 5

7. A pictograph uses a symbol  to represent 20 buses, to represent 140 buses, how many symbols would be required?
 (a) 6 (b) 7 (c) 8 (d) 14
8. A bar graph shows the population of a city for several years. The vertical axis represents the population in thousands, and the scale is 1 unit length = 2000 people. If a bar is 12 units high, what is the population?
 (a) 25000 (b) 12000 (c) 120000 (d) 24000
9. A bar graph represents the number of movies watched by students. The scale is 1 unit length = 2 movie. If a student watched 6 movies, what would be the height of the bar?
 (a) 6 units (b) 2 units (c) 4 units (d) 3 units
10. A pictograph uses the symbol  to represent 20 bulbs, how many symbols would be required to represent 90 bulbs ?
 (a) $4\frac{1}{2}$ (b) 5 (c) $3\frac{1}{2}$ (d) 4

Short Answer Questions(2 Marks)

11. A bar graph shows the number of buses passing a point. The bar for Monday is 8 units high and the bar for Tuesday is 12 units high. If the scale is 1 unit length = 2 buses ,what is the total number of buses that passed on both days?
12. A pictograph uses the symbol  to represent 20 flowers. How many symbols are needed to represent 150 flowers. What would be the total number of trees if the pictograph had 6 and a half symbols?
13. The following table shows the number of books read by students of a class in a month.

Name of student	Number of Books
Remya	5
Suma	7
Rohit	6
Amit	4

- (a) What is the total number of books read by all the students ?
 (b) How many more books did Suma read than Amit ?
14. A teacher collected data on the number of students who forgot their student diary for 6 days of a week : 5 , 3 , 2 , 4 , 2 , 1. What is the minimum and maximum number of students who forgot their student diary? How many students forgot their student diary in six days?
15. Students of a class were asked to say their favorite colour. The responses were as follows Blue (8) , Red (12) Green (6), Pink (9) . Prepare a frequency table using tally marks for this data.

Short Answer Questions(3 Marks)

16. The marks obtained by 20 students in a class test are as follows
 5 , 8 , 6 , 7 , 9 , 8 , 10 , 8 , 6 , 8 , 9 , 5 , 7 , 8 , 6 , 7 , 9 , 5 , 8 , 7
 Prepare a frequency distribution table using tally marks. What is the most frequently occurring mark ?

17. A pictograph shows the number of mangoes sold by a vendor over four days. The symbol



represents 10 mangoes.

Day	Number of Mangoes sold
Monday	   
Tuesday	    
Wednesday	  
Thursday	     

- How many more mangoes were sold on Thursday than Monday ?
- What is the total number of mangoes sold on these four days?
- On which day, the sale of mangoes was the minimum?

18. The following table shows the number of ice creams sold on different days

Day	No. of Ice-creams sold
Monday	20
Tuesday	25
Wednesday	15
Thursday	30
Friday	10

- On which day was the sale maximum ?
- On which day was the sale minimum ?
- Find the difference between the maximum and minimum sales.

19. A Survey was conducted to know the modes of transport used by 45 students of a school.

Mode	Number of Students
Bus	20
Car	10
Bicycle	5
Walk	10

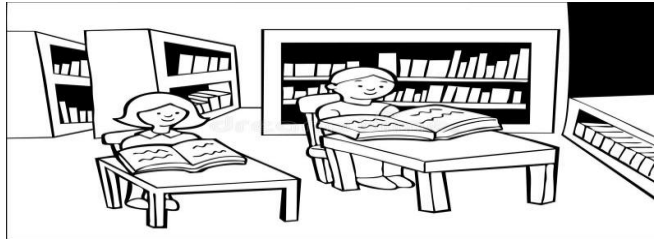
- Draw a bar graph for this data.
- Which mode of transport is least used ?

20. A pictograph represents the number of cars manufactured by a company over a few years, with one symbol representing 400 cars.

- If the company manufactured 3200 cars in a year, how many symbols would be needed ?
- What is the total number of cars represented by 6 complete symbols and a half symbol?

Case Study Questions (4 Marks)

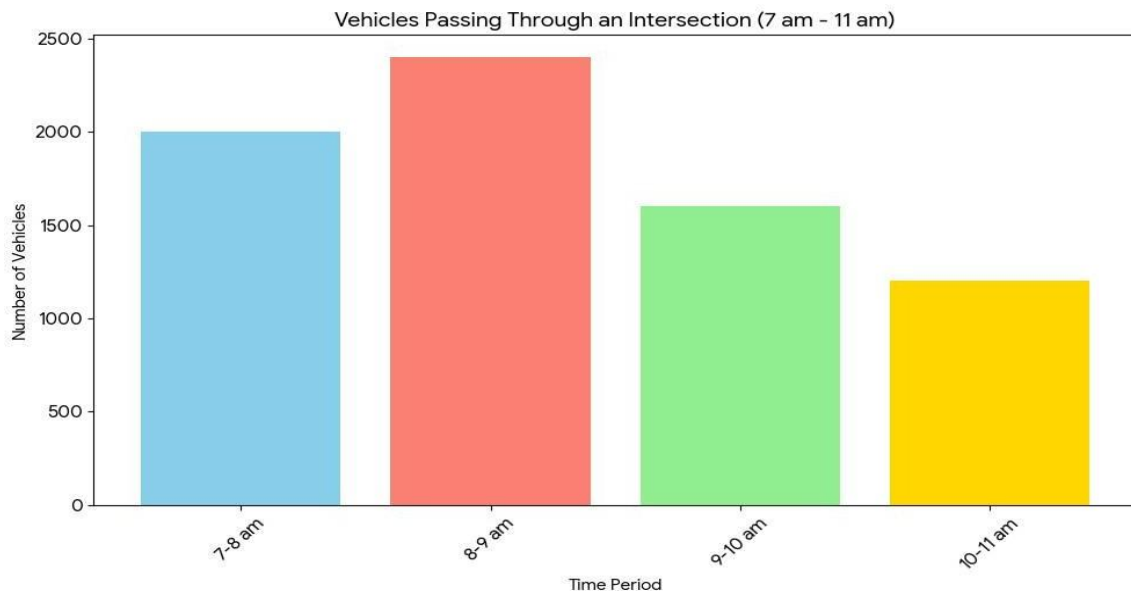
21. A librarian wanted to understand the reading habits of students in classes 6 to 12. She collected data on the number of books issued to students in each class during a specific month. The data is as follows:



Section	No. of books borrowed
Science	50
Maths	40
Story	70
History	30
General Knowledge	60

Based on this information , answer the following questions

- (a) Which section has the least number of borrowed books?
 - (b) “The number of books borrowed in General knowledge section is double the number of books borrowed from the History section” is this statement true ?
 - (c) Find the total number of books borrowed from the library?
22. A traffic police officer recorded the number of vehicles passing through an intersection in a busy city over four different hours. The data is represented in the bar graph below, where the scale is 1 unit length = 500 vehicles.



- (a) During which hour was the traffic the heaviest ?
- (b) How many more vehicles passed between 7-8 am compared to 9-10 am?
- (c) What is the combined total of vehicles for the two hours with the least traffic?

Worksheet on Data Handling

Marking Scheme

Multiple Choice Questions (1 Mark)

1. (c) 
2. (b) 20 students
3. (a) 40 kg
4. (a) 1st
5. (c) 23 units
6. (a) 15
7. (b) 7
8. (d) 24000
9. (d) 3 units
10. (a) $4\frac{1}{2}$

Short Answer Questions (2 Marks)

- | | |
|---|------------------------|
| 11. No. of buses passing through the point on Monday = $8 \times 2 = 16$ | $\frac{1}{2}$ |
| No. of buses passing through the point on Tuesday = $12 \times 2 = 24$ | $\frac{1}{2}$ |
| Total No. of buses passing through the point = $24 + 16 = 40$ | 1 |
| 12.No. of symbols required for 150 flowers = $7\frac{1}{2}$ | 1 |
| No. of trees representing $6\frac{1}{2}$ flowers = 130 | 1 |
| 13. (a) Total number of books read by all the students = $5 + 7 + 6 + 4 = 22$ | 1 |
| (b) No. of more books Suma read than Amit = $7 - 4 = 3$ | 1 |
| 14. Minimum No. of students who forgot their diary = 1 | $\frac{1}{2}$ |
| Maximum No. of students who forgot their diary = 5 | $\frac{1}{2}$ |
| Total No. of students who forgot their diary = $5+3+2+4+2+1= 17$ | 1 |
| 15.For each correct frequency - | $4 \times \frac{1}{2}$ |

Short Answer Questions (3 Marks)

16.

Marks	Tally Marks	Frequency
5	III	3
6	III	3
7	IIII	4
8	IIII I	6
9	III	3
10	I	1
Total		20

2

Most frequently occurring mark = 8

1

17. (a) More mangoes sold on Thursday than Monday = $2 \times 10 = 20$ 1
 (b) Total number of mangoes sold on these four days = $18 \times 10 = 180$ 1
 (c) Day on which the sale of mangoes was the minimum = Wednesday 1
18. (a) Day on which the sale was maximum = Thursday 1
 (b) Day on which the sale was minimum = Friday 1
 (c) Difference between the maximum and minimum sales = $30 - 10 = 20$ 1
19. (a) for drawing the correct bar graph 2
 (b) mode of transport is least used = Bicycle 1
20. (a) No. of symbols needed = $\frac{3200}{400} = 8$ 2
 (b) No. of cars represented by 6 complete symbols and a half symbol = 2600 1

Case Study Questions (4 Marks)

21. (a) Section has the least number of borrowed books = History 1
 (b) “The number of books borrowed in General knowledge section is double the number of books borrowed from the History section” is this statement true ?
 True 1
 (c) Total number of books borrowed from the library = $50+40+70+30+60=250$ 2
22. (a) During which hour was the traffic the heaviest = 8 – 9 am 1
 (b) More vehicles passed between 7-8 am compared to 9-10 am = $2000-1500 = 500$ 1
 (c) The combined total of vehicles for the two hours with the least traffic
 = $1500 + 1000 = 2500$ 2

CLASS 6 MATHS – DATA HANDLING AND PRESENTATION

MCQs (1 Mark)

1. The table shows the number of visitors to a park during one week.

Day	Visitors
Mon	120
Tue	180
Wed	200
Thu	160
Fri	140

If the park charges ₹10 per visitor, what was the total collection for the week?

- A) ₹7,800
- B) ₹8,000
- C) ₹8,400
- D) ₹9,000

Answer: B) ₹8,000

2. A class survey shows the number of pets owned by students.

Number of Pets	0	1	2	3
Number of Students	5	10	8	2

How many students have *at least* one pet?

- A) 10
- B) 15
- C) 20
- D) 25

Answer: C) 20

3. A pictograph shows  = 10 buses. If a school has $3\frac{1}{2}$ symbols for the number of buses used for trips, how many buses are there?

- A) 30
- B) 35
- C) 40
- D) 45

Answer: B) 35

4. The daily temperature of a city (in °C) over 5 days is: 28, 30, 32, 31, 29. What is the range?

- A) 3°C
- B) 4°C
- C) 5°C
- D) 6°C

Answer: B) 4°C

5. In a line graph showing school library visitors per day, Monday has 50, Tuesday 65, Wednesday 65, Thursday 85, Friday 55. On which two consecutive days was the greatest increase?

- A) Mon–Tue
- B) Tue–Wed
- C) Wed–Thu
- D) Thu–Fri

Answer: C) Wed–Thu

6. A company produced 200, 300, 250, 400, and 350 units in five consecutive months. The average monthly production target was 300. In how many months was production *below* the target?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: B) 2

7. Observe the following table and answer the related question:

Blood Groups	Number of students
A	9
B	6
O	12
AB	3
Total	30

Which blood group is the most common?

- (a) A
- (b) B
- (c) O
- (d) AB.

Answer: (c) O

8. Observe the following pictograph and answer the related question :

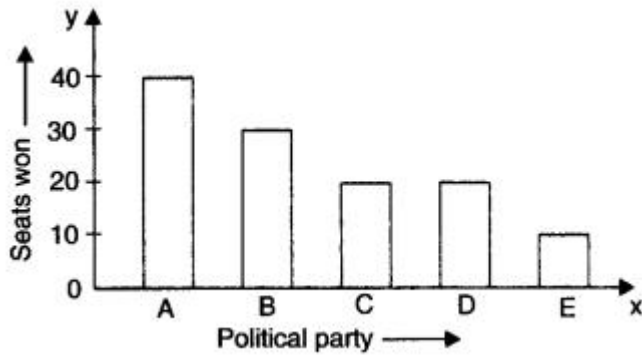
Day	Number of students present
	 = 10 students
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

On which day were the maximum number of students present?

- (a) Monday
- (b) Thursday
- (c) Tuesday
- (d) Saturday.

Answer: (b) Thursday

9.Observe the following bar graph and answer the related questions:

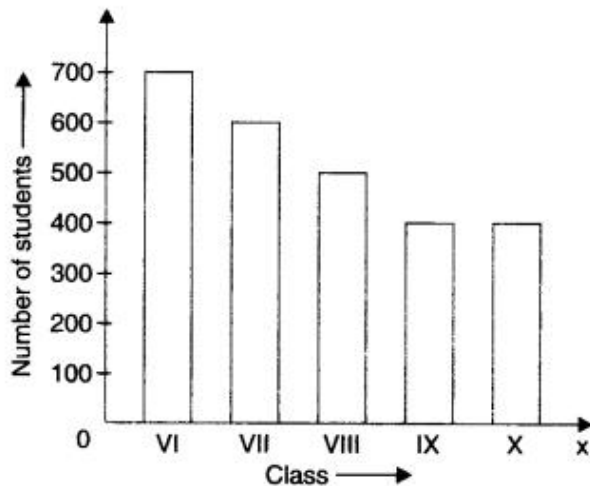


Which political party won the minimum number of seats?

- (a) A
- (b) B
- (c) D
- (d) E.

Answer: (d) E

10.Observe the following bar graph and answer the related questions:



In which class is the number of students 500?

- (i) VIII
- (ii) VII
- (c) IX
- (d) X.

Answer (a) VIII

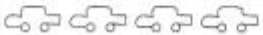
2 Marks Questions

1. A die was thrown 35 times and the following numbers were obtained:
5, 1, 4, 2, 3, 2, 6, 6, 1, 4, 2, 5, 4, 5, 3, 6, 1, 5
2, 6, 2, 5, 4, 1, 3, 2, 1, 4, 1, 6, 2, 6, 3, 3, 3
Prepare a frequency table for the data.

Solution: From the given data, we have the following table.

Number	Tally marks	Frequency
1		6
2		7
3		6
4		5
5		5
6		6

2. Mr. Rajan made a pictograph given below to show the number of cars washed at a car washing station during three days of a week.

Days	Number of cars washed	One  = 5 cars
Friday		
Saturday		
Sunday		

From the pictograph, find that:

- (a) How many cars were washed on
(i) Friday
(ii) Saturday?
(b) On which day the maximum number of cars were washed at the station?
(c) On which day the minimum number of cars were washed at the station?
(d) How many more cars were washed on Saturday than on Friday?

Solution:

- (a) (i) On Friday – $4 \times 5 = 20$ cars
(ii) On Saturday – $9 \times 5 = 45$ cars

- (b) On Saturday, the maximum number of cars, i.e., $9 \times 5 = 45$ were washed at the stations.
(c) On Friday, the minimum number of cars, i.e., $4 \times 5 = 20$ were washed on the station.
(d) $45 - 20 = 25$ more cars were washed on Saturday than on Friday.

3. In March 2012, children for six colonies of Meerut were given pulse polio Drops. The colony wise number of children were as follows:

Colony A	2250
Colony B	1500
Colony C	2000
Colony D	1250
Colony E	1000
Colony F	1500

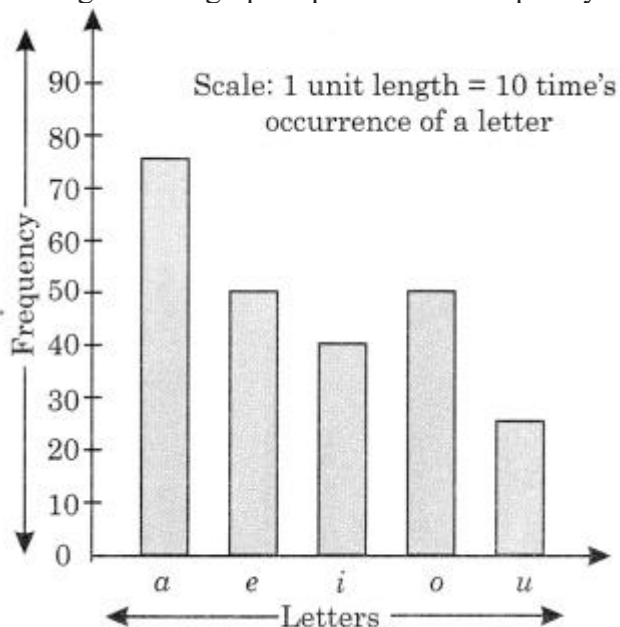
Represent the data by pictograph.

Solution:

Pictograph:

Colony	Number of children	One  = 500 children
A		
B		
C		
D		
E		
F		

4. The given bar graph represents the frequency of a, e, i, o, and u in a piece of English writing.



- Which letter occurred the maximum number of times?
- Which letter occurred 40 times?
- Which letter occurred less than 30 times?
- Write down the five letters in the decreasing order of frequencies.

Solution:

- a letter occurred the maximum number of times.

- (b) i letter occurred 40 times.
 (c) u letter occurred less than 30 times.
 (d) a, e, o, i, u is the decreasing order of their frequencies

Question: 5.

Study the tally marks frequency table and answer the questions given below:

Marks obtained by students in maths test	Tally Marks
12	IIII III
16	IIII
18	II
10	IIII IIII
20	III

- (i) How many students score 10 marks?
 (ii) How many students scored above 10?
 (iii) How many total students appeared on the test?

Solution

- (i) Number of students scored 10 marks = 10
 (ii) Number of students scored above 10 marks = 17
 (iii) Total number of students who appeared for the test = 27

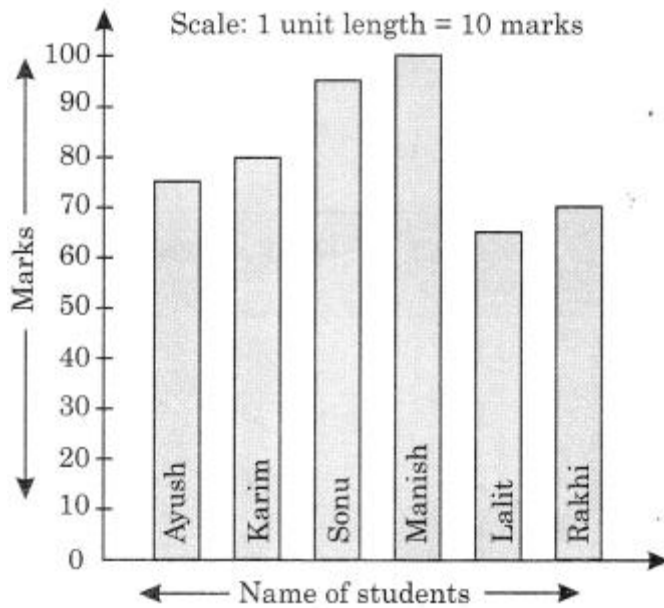
3 marks Questions

1. The marks obtained by six students in Mathematics are given below. Represent the data by a bar graph. Use a scale of 0.5 cm for each name on the horizontal axis and 0.5 cm for 10 marks on the vertical axis.

Students	Marks
Ayush	75
Karim	80
Sonu	95
Manish	100
Lalit	65
Rakhi	70

Solution:

The required bar graph is given as below:



2. The result of a Mathematics test is as follows:

80, 90, 70, 80, 80, 60, 80, 70, 90, 65, 100, 60, 70, 60, 70, 85, 65, 70, 70, 85, 90, 60, 65, 80, 60

Make a frequency table for the above data and answer the following questions:

- What is the maximum marks obtained?
- How many students score less than 75 marks?
- How many students scored 80 marks or above?
- How many students appeared in the test?

Solution:

From the above information, we have the following table.

Marks obtained	Tally marks	Frequency
60		5
65		3
70		6
80		5
85		2
90		3
100		1

- Maximum marks obtained by a student = 100
- $5 + 3 + 6 = 14$ students obtained marks less than 75.
- $5 + 2 + 3 + 1 = 11$ students scored marks 80 or above 80.
- Total 25 students were appeared in the test

3. Read the pictograph given below and answer the following questions:
Persons employed in one year

Job	Number of persons	Each  = 3000 persons
Private service		
Government service		
Factory service		

- (a) What is the number of persons employed in government service?
(b) How many more persons were employed in government service than in private service?

(c) In which service, were the maximum number of persons employed?

Solution:

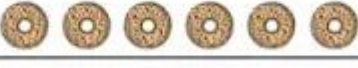
(a) Number of persons employed in government service = $10 \times 3000 = 30,000$

(b) $10 \times 3000 - 6 \times 3,000 = 30,000 - 18,000 = 12,000$ persons were employed more in government service than in private service.

(c) In government service, the maximum number of persons were employed.

4. Tim recorded the number of donuts sold over five days.

Read the chart and answer the questions.

Day	Number of donuts sold
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

 = 5 donuts

- How many donuts did he sell on Thursday?
- Which day did he sell the least donuts?
- Which day did he sell the most donuts?
- Which day did he sell 20 donuts?

Solution

- Donuts sold on Thursday = $5 \times 5 = 25$ donuts
- least donuts were sold on Wednesday
- most donuts were sold on Friday
- Tuesday

5. The pictograph shows how many snowballs each child made. Use the pictograph to answer the given questions.

Aaron	 
Adeline	    
Adora	   
Alexander	       
Alfredo	  
Anna	      
Avery	     
Bailey	      

key:  equals 4 snowballs

(i) How many snowballs did Alfredo make?

Answer : There are 3 pictures in front of Alfredo. 1 snowflake represents 4 snowballs made.
So, Alfredo made $3 \times 4 = 12$ snowballs.

(ii) How many snowballs did Aaron make?

Answer: There are 2 pictures in front of Aaron. 1 snowflake represents 4 snowballs made.
So, Aaron made $2 \times 4 = 8$ snowballs.

(iii) Name two people who made the same number of snowballs.

Answer: Anna and Bailey made the same number of snowballs.
We can simply look at the number of snowflakes in front of each name and see that Anna and Bailey have same number of snowflakes drawn in front of their names.
There are 7 snowflakes which means $7 \times 4 = 28$. So, Anna and Bailey, both of them, made 28 snowballs each.

(iv) How many more snowballs did Bailey make than Adeline?

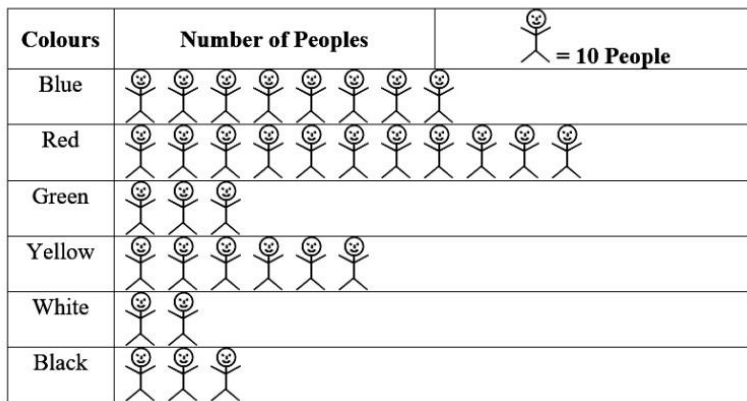
Answer: Bailey made 28 snowballs where as Adeline made 20 snowballs ($5 \times 4 = 20$)
 $28 - 20 = 8$
Bailey made 8 more snowballs than Adeline.

(v) How many more snowballs did Alexander make than Adora?

Answer: Alexander : $8 \times 4 = 32$ snowballs, Adora: $4 \times 4 = 16$, $32 - 16 = 16$ Alexander made 16 more snowballs than Adora.

Case study Questions

1. The colours of fridges preferred by people living in a locality are shown by the following pictograph.

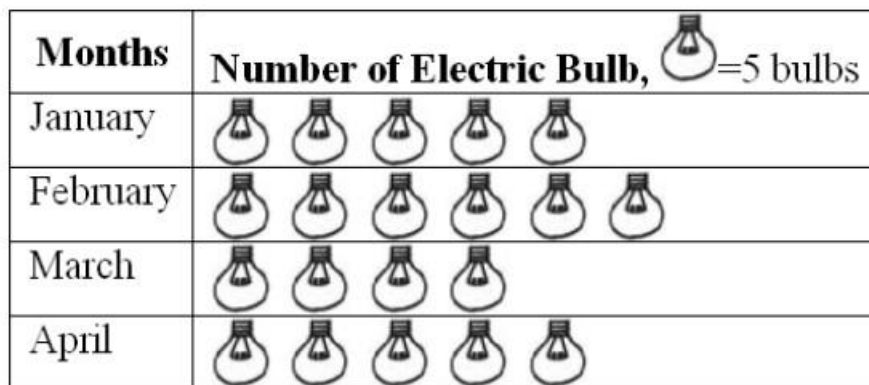


Read the table and answer the questions given below:

- Find the number of people preferring blue colour.
- How many people liked red colour?
- Find the number of people preferring white colour.
- Find the number of people preferring yellow colour.

Answer: (a) 80 (b) 110 (c) 20 (d) 60

2. The sale of electric bulbs on different days of a month is shown below. From the following pictograph,



- Find the number of electric bulbs purchased for a lodging house during February
- Find the number of electric bulbs purchased for a lodging house during April
- In which month the sale of electric bulb is least.
- In which month the sale of electric bulb is maximum.

Answer: (a) 30 (b) 25 (c) March (d) February

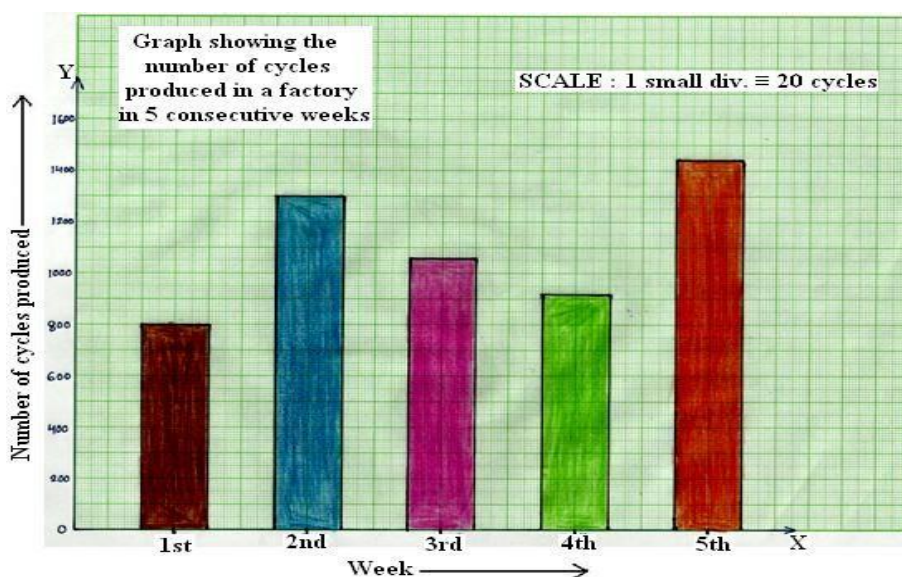
Worksheet on Data Handling

Sub : Maths

Class : VI

Multiple Choice Questions (1 Mark)

1. In a tally mark table , a group of Six is represented as
(a) ||||| | (b) V I (c) |||| | (d) ||||| |
2. In a pictograph , if the picture ☺ represents 5 students , then ☺ ☺ ☺ ☺ represent
(a) 4 students (b) 20 students (c) 40 students (d) 8 students
3. A bar graph has a scale of 1 unit length = 10 kg. A bar for the weight of a student 4 units tall is
(a) 40 kg (b) 20 kg (c) 35 kg (d) None of these
4. The following bar graph shows the number of cycles produced in a factory in five consecutive weeks.



In which week, the production of cycles is the least ?

- (a) 1st (b) 2nd (c) 3rd (d) 4th
5. The number of students in a class is 46. A bar graph is drawn with a scale of 1 unit length = 2 students. The height of the bar for the class is
(a) 46 units (b) 20 units (c) 23 units (d) 10 units
 6. A survey was conducted on favorite sports and the number of students who like the game is written in bracket. Football(15), Cricket(20), Basketball(10), Tennis(5). How many more students prefer Cricket than Tennis?
(a) 15 (b) 20 (c) 10 (d) 5

7. A pictograph uses a symbol  to represent 20 buses, to represent 140 buses, how many symbols would be required?
 (a) 6 (b) 7 (c) 8 (d) 14
8. A bar graph shows the population of a city for several years. The vertical axis represents the population in thousands, and the scale is 1 unit length = 2000 people. If a bar is 12 units high, what is the population?
 (a) 25000 (b) 12000 (c) 120000 (d) 24000
9. A bar graph represents the number of movies watched by students. The scale is 1 unit length = 2 movie. If a student watched 6 movies, what would be the height of the bar?
 (a) 6 units (b) 2 units (c) 4 units (d) 3 units
10. A pictograph uses the symbol  to represent 20 bulbs, how many symbols would be required to represent 90 bulbs ?
 (a) $4\frac{1}{2}$ (b) 5 (c) $3\frac{1}{2}$ (d) 4

Short Answer Questions(2 Marks)

11. A bar graph shows the number of buses passing a point. The bar for Monday is 8 units high and the bar for Tuesday is 12 units high. If the scale is 1 unit length = 2 buses ,what is the total number of buses that passed on both days?
12. A pictograph uses the symbol  to represent 20 flowers. How many symbols are needed to represent 150 flowers. What would be the total number of trees if the pictograph had 6 and a half symbols?
13. The following table shows the number of books read by students of a class in a month.

Name of student	Number of Books
Remya	5
Suma	7
Rohit	6
Amit	4

- (a) What is the total number of books read by all the students ?
 (b) How many more books did Suma read than Amit ?
14. A teacher collected data on the number of students who forgot their student diary for 6 days of a week : 5 , 3 , 2 , 4 , 2 , 1. What is the minimum and maximum number of students who forgot their student diary? How many students forgot their student diary in six days?
15. Students of a class were asked to say their favorite colour. The responses were as follows Blue (8) , Red (12) Green (6), Pink (9) . Prepare a frequency table using tally marks for this data.

Short Answer Questions(3 Marks)

16. The marks obtained by 20 students in a class test are as follows
 5 , 8 , 6 , 7 , 9 , 8 , 10 , 8 , 6 , 8 , 9 , 5 , 7 , 8 , 6 , 7 , 9 , 5 , 8 , 7
 Prepare a frequency distribution table using tally marks. What is the most frequently occurring mark ?

17. A pictograph shows the number of mangoes sold by a vendor over four days. The symbol



represents 10 mangoes.

Day	Number of Mangoes sold
Monday	   
Tuesday	    
Wednesday	  
Thursday	     

- How many more mangoes were sold on Thursday than Monday ?
 - What is the total number of mangoes sold on these four days?
 - On which day, the sale of mangoes was the minimum?
18. The following table shows the number of ice creams sold on different days

Day	No. of Ice-creams sold
Monday	20
Tuesday	25
Wednesday	15
Thursday	30
Friday	10

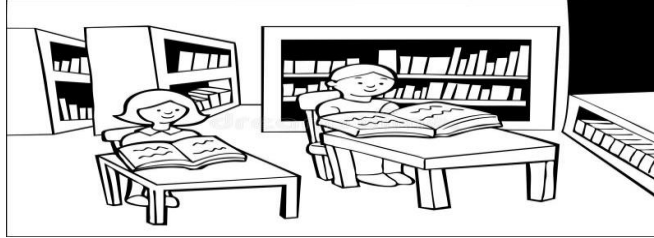
- On which day was the sale maximum ?
 - On which day was the sale minimum ?
 - Find the difference between the maximum and minimum sales.
19. A Survey was conducted to know the modes of transport used by 45 students of a school.

Mode	Number of Students
Bus	20
Car	10
Bicycle	5
Walk	10

- Draw a bar graph for this data.
 - Which mode of transport is least used ?
20. A pictograph represents the number of cars manufactured by a company over a few years, with one symbol representing 400 cars.
- If the company manufactured 3200 cars in a year, how many symbols would be needed ?
 - What is the total number of cars represented by 6 complete symbols and a half symbol?

Case Study Questions (4 Marks)

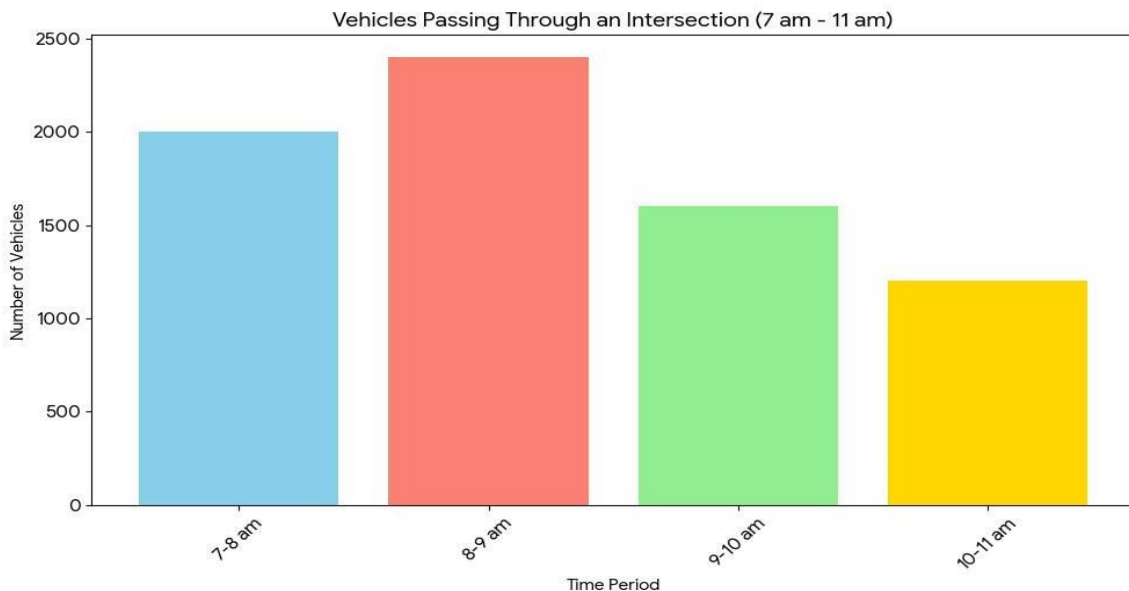
21. A librarian wanted to understand the reading habits of students in classes 6 to 12. She collected data on the number of books issued to students in each class during a specific month. The data is as follows:



Section	No. of books borrowed
Science	50
Maths	40
Story	70
History	30
General Knowledge	60

Based on this information , answer the following questions

- (a) Which section has the least number of borrowed books?
- (b) “The number of books borrowed in General knowledge section is double the number of books borrowed from the History section” is this statement true ?
- (c) Find the total number of books borrowed from the library?
22. A traffic police officer recorded the number of vehicles passing through an intersection in a busy city over four different hours. The data is represented in the bar graph below, where the scale is 1 unit length = 500 vehicles.



- (a) During which hour was the traffic the heaviest ?
- (b) How many more vehicles passed between 7-8 am compared to 9-10 am?
- (c) What is the combined total of vehicles for the two hours with the least traffic?

Worksheet on Data Handling

Marking Scheme

Multiple Choice Questions (1 Mark)

1. (c) 
2. (b) 20 students
3. (a) 40 kg
4. (a) 1st
5. (c) 23 units
6. (a) 15
7. (b) 7
8. (d) 24000
9. (d) 3 units
10. (a) $4\frac{1}{2}$

Short Answer Questions (2 Marks)

- | | |
|---|------------------------|
| 11. No. of buses passing through the point on Monday = $8 \times 2 = 16$ | $\frac{1}{2}$ |
| No. of buses passing through the point on Tuesday = $12 \times 2 = 24$ | $\frac{1}{2}$ |
| Total No. of buses passing through the point = $24 + 16 = 40$ | 1 |
| 12.No. of symbols required for 150 flowers = $7\frac{1}{2}$ | 1 |
| No. of trees representing $6\frac{1}{2}$ flowers = 130 | 1 |
| 13. (a) Total number of books read by all the students = $5 + 7 + 6 + 4 = 22$ | 1 |
| (b) No. of more books Suma read than Amit = $7 - 4 = 3$ | 1 |
| 14. Minimum No. of students who forgot their diary = 1 | $\frac{1}{2}$ |
| Maximum No. of students who forgot their diary = 5 | $\frac{1}{2}$ |
| Total No. of students who forgot their diary = $5+3+2+4+2+1 = 17$ | 1 |
| 15.For each correct frequency - | $4 \times \frac{1}{2}$ |

Short Answer Questions (3 Marks)

16.

Marks	Tally Marks	Frequency
5	III	3
6	III	3
7	IIII	4
8	IIII I	6
9	III	3
10	I	1
Total		20

2

Most frequently occurring mark = 8

1

17. (a) More mangoes sold on Thursday than Monday = $2 \times 10 = 20$ 1
 (b) Total number of mangoes sold on these four days = $18 \times 10 = 180$ 1
 (c) Day on which the sale of mangoes was the minimum = Wednesday 1
18. (a) Day on which the sale was maximum = Thursday 1
 (b) Day on which the sale was minimum = Friday 1
 (c) Difference between the maximum and minimum sales = $30 - 10 = 20$ 1
19. (a) for drawing the correct bar graph 2
 (b) mode of transport is least used = Bicycle 1
20. (a) No. of symbols needed = $\frac{3200}{400} = 8$ 2
 (b) No. of cars represented by 6 complete symbols and a half symbol = 2600 1

Case Study Questions (4 Marks)

21. (a) Section has the least number of borrowed books = History 1
 (b) "The number of books borrowed in General knowledge section is double the number of books borrowed from the History section" is this statement true ?
 True 1
 (c) Total number of books borrowed from the library = $50+40+70+30+60=250$ 2
22. (a) During which hour was the traffic the heaviest = 8 – 9 am 1
 (b) More vehicles passed between 7-8 am compared to 9-10 am = $2000-1500 = 500$ 1
 (c) The combined total of vehicles for the two hours with the least traffic
 = $1500 + 1000 = 2500$ 2

Worksheet

Class 6 Data Handling and representation

MCQ

1. What is the term used for a collection of observations, facts, or figures collected for a specific purpose?

- A) Table
- B) Graph
- C) Data
- D) Tally Mark

2. A bar graph shows the number of books read by students in a month. The bar for 'Fiction' reaches the mark that is exactly halfway between 30 and 40 on the vertical axis (Number of Books). How many books were read in the 'Fiction' category?

- A) 30 B) 40 C) 35 D) 70

3: In a data set, if the observation 'Football' appears 12 times, what is the frequency of the observation 'Football'?

- A) 1
- B) 12
- C) 5
- D) Football

4: A pictograph uses a symbol to represent 10 pencils. If a class has 50 pencils, how many symbols will be needed to show this data?

- A) 5
- B) 10
- C) 50
- D) 500

5: What is the height of the bars in a bar graph proportional to?

- A) The width of the bar
- B) The space between the bars
- C) The frequency of the corresponding observation
- D) The number of categories

6: When drawing a bar graph, which of the following features must be kept uniform (the same) for all bars?

- A) The height of the bars
- B) The frequency shown on the vertical axis
- C) The gap between the bars and the width of the bars
- D) The colour of the bars

7: The process of analyzing and finding conclusions or answers from the represented data (e.g., from a bar graph) is called:

- A) Data Collection
- B) Organization of Data
- C) Representation of Data
- D) Data Interpretation

8: The scores of a student in 5 tests are 8, 7, 9, 8, and 6. What is the frequency of the score 8?

- A) 1
- B) 2
- C) 3
- D) 8

9: A survey of 30 students showed that 15 like Cricket and 8 like Basketball. How many students like other sports?

- A) 7
- B) 8
- C) 15
- D) 23

10: In a pictograph, if a half-symbol represents 6 units, what is the full symbol representing?

- A) 3 units
- B) 6 units
- C) 12 units
- D) 18 units

VERY SHORT ANSWER QUESTIONS

11. A pictograph uses the symbol  to represent **8 kilograms** of apples. If the pictograph shows **4 full**  symbols and **one half-symbol** (half of ) , what is the total weight of apples represented?
12. In a bar graph showing the number of books in a school library, the bar for **Fiction** reaches 250 books and the bar for **Science** reaches 180 books. Which category has the maximum number of books, and what is the difference in number between the two categories?
13. When you record the weight of every puppy in a litter, and one puppy's weight is 3.5 kg, what is the value '3.5 kg' called in data handling terminology?
14. If the vertical axis (y-axis) of a bar graph uses a scale where **1 unit = 5 children**, and a particular bar has a height of **11 units**, what is the frequency (number of children) represented by that bar?
15. If you are drawing a bar graph to show the **daily temperature** of a city over a week, which axis (horizontal or vertical) would typically represent the **days of the week**, and which axis would represent the **temperature**?
16. The following are the marks (out of 10) obtained by 15 students in a class test:
7, 5, 8, 7, 5, 6, 10, 7, 8, 5, 9, 6, 7, 5, 8
- Prepare a **Frequency Distribution Table** for this data using **Tally Marks**.
17. A bicycle shop prepared a pictograph showing the number of cycles sold over four months, using the scale: **1 Cycle Symbol C= 50 Cycles**.

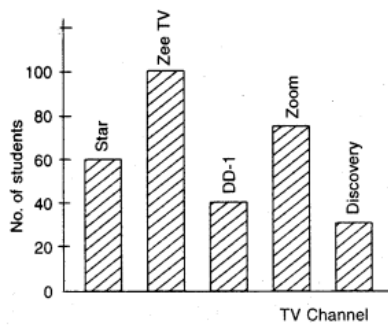
Month	Number of Cycles Sold (in Symbols)
March	CCC
April	CCCCC
May	CCCC
June	CCCCCC

Using the information above, answer the following questions:

- (a) What was the total number of cycles sold in all four months?
- (b) What is the difference between the sales in June and the sales in March?

LONG ANSWER QUESTIONS

18) Observe the following bar graph and answer the following questions:



- i) How many students like DD – 1 ?
 (a) 20 (b) 40 (c) 60 (d) 80
- ii) Which TV channel is liked by least number of students?
 (a) Star (b) DD – 1 (c) Zoom (d) Discovery
- iii) Which TV channel is more favourable?
 (a) Star (b) Zee TV (c) DD – 1 (d) Zoom

19) Pooja collected data on the number of tickets sold at the Bhopal railway station for a few different cities of Madhya Pradesh over a two-hour period. She used this data and prepared a bar graph on the board to discuss the data with her students, but someone erased a portion of the graph.

City	Vidisha	Jabalpur	Seoni	Indore	Sagar
Number of tickets	24	20	16	28	16



- Write the number of tickets sold for Vidisha above the bar.
- Write the number of tickets sold for Jabalpur above the bar.
- The bar for Vidisha is 6 unit lengths and the bar for Jabalpur is 5 unit lengths. What is the scale for this graph?

20) A school surveyed 100 students to determine their favourite sport. The data was organized and presented in a bar graph. On the vertical axis, 1 unit length was chosen to represent 20 students. The heights of the bars for the top four sports were recorded as follows:

Cricket: 10 units

Football: 6 units

Badminton: 4.5 units

Basketball: 3 units

- How many more students prefer Cricket than Football?
- What was the actual number of students who chose Badminton as their favourite sport?
- Calculate the total percentage of students who chose either Cricket or Football.

CASE STUDY

21) A librarian is preparing a report on the types of books purchased for the school library last month. The data shows the number of books purchased for four genres:

Genre	Number of Books
Fiction	150
Non-Fiction	120
Comics	80
Poetry	50

The librarian decides to represent this data using a Pictograph where the symbol Δ represents 30 books.

- How many symbols Δ would the librarian need to draw to represent the number of Poetry books?
- What is the total number of books in the Fiction and Non-Fiction genres combined?
- To represent the number of Comics books, what fraction of the symbol Δ would be required? (Express as a simple fraction)
- The number of Fiction books is what multiple of the number of Poetry books?
- If the librarian decided to use a Bar Graph instead, and set the scale to 1 unit length = 10 books, what would be the total length (in units) of all four bars combined?

22) A teacher, Shri Nilesh, wants to buy sweets for his class. He surveys his students to find out their preferences and creates the following chart

Sweets	No of students
Jalebi	6
Gulab jamun	9
Gujiya	13
Barfi	3
Rasgulla	7

Based on the tally marks,

- how many students chose Gujiya?
- Which sweet was the most popular choice among the students?

- c) If the number of students who chose Rasgulla is added to the number of students who chose Barfi,
- d) what is the total?

Answers

1. Data
2. 35
3. 12
4. 5
5. The frequency of the corresponding observation
6. The gap between the bars and the width of the bars
7. Data interpretation
8. 2
9. 7
10. 12
11. $(4 \times 8) + 4 = 36$
12. 70 books
13. Observation
14. 55 children
15. The **horizontal axis (x-axis)** would typically represent the **days of the week** (the categories/observations). The **vertical axis (y-axis)** would represent the **temperature** (the frequency/measure).
16. . draw frequency table
17. a) 900 cycles b) 150 cycles
18. i) 20 ii) Zoom III) Zee TV
19. I) 24 ii) 20 iii) 1 unit = 4 ticket
20. I) 80 ii) 90 iii) 320
21. I) 1 and $\frac{2}{3}$ ii) 270 iii) 2 and $\frac{2}{3}$ iv) 3 v) 40
22. I) 13 li) gujiya iii) 10 iv) 38

Worksheet prepared by

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TGT Maths

PM SHRI KV NAD Aluva

COMPETECY BASED WORKSHEET

CLASS 6

Chapter: PRIME TIME

SECTION A - MCQ (10 x 1mark each)

1. A number is divisible by both 2 and 3. Which of the following statements is always true?
A) The number is divisible by 5
B) The number is divisible by 6
C) The number is divisible by 9
D) The number is divisible by 4
2. Which of the following numbers is a prime number?
A) 27
B) 39
C) 29
D) 49
3. If 45 and 60 are two numbers, then their HCF is:
A) 5
B) 10
C) 15
D) 20
4. A shopkeeper arranges 24 red pens and 36 blue pens in equal rows without mixing colours. What is the maximum number of pens in each row?
A) 4
B) 6
C) 8
D) 12
5. The LCM of 12 and 18 is:
A) 24
B) 36
C) 48
D) 72
6. Which of the following numbers has exactly two factors?
A) 1
B) 2
C) 4
D) 9
7. Riya wants to buy equal number of apples and oranges for making fruit baskets. Apples are sold in packs of 8 and oranges in packs of 12. What is the smallest number of each fruit she should buy to make equal baskets?
A) 12
B) 16
C) 24
D) 36
8. Which of the following statements is true?
A) All even numbers are prime
B) 1 is a prime number
C) The smallest prime number is 2
D) 9 is a prime number
9. If a number is divisible by 9, the sum of its digits must be:
A) Even

- B) Divisible by 9
 - C) Divisible by 3
 - D) Equal to 9
10. Find the product of the first three prime numbers.
- A) 5
 - B) 10
 - C) 30
 - D) 35

SECTION B (5 x 2 marks)

11. Find the largest and smallest 4-digit numbers that are divisible by 4 and are also palindromes.
12. In a school sports day, students are divided into teams for running races. There are 48 boys and 60 girls. The teacher wants to make groups with the same number of students and no one left out. Find the maximum number of students in each group.
13. Check whether 253 is a prime number or not. Justify your answer.
14. A sweet shop packs sweets in boxes containing 8 sweets each or 12 sweets each. What is the smallest number of sweets that must be prepared so that all boxes are completely filled?
15. Find all the prime factors of 84 and express the number as a product of its prime factors.

SECTION C (5 x 3 marks)

16. Find the smallest natural number that has 6 factors in all.
17. A school wants to arrange 480 boys and 360 girls in rows for the morning assembly. Each row must have the same number of students and only boys or girls in a row.
 - a) Find the maximum number of students in each row.
 - b) How many rows of boys and how many rows of girls will be formed?
18. A baker packs biscuits in boxes of 24 biscuits each and cakes in boxes of 36 cakes each. He wants to deliver the same number of biscuits and cakes to each shop.
 - a) Find the minimum number of biscuits and cakes he should pack.
 - b) How many boxes of each will he send to one shop?
19. A decorator has 54 red balloons, 81 blue balloons, and 108 yellow balloons. He wants to make decoration clusters with an equal number of each colour balloon.
 - a) Find the maximum number of clusters he can make.
 - b) How many balloons of each colour will each cluster contain?
20. A number is divisible by both 3 and 5 but not by 2. What is the smallest such number?

SECTION D - CASE STUDY (2 x 4 marks)

21. In a school library, there are 780 books of English and 364 books of Science. Ms. Smitha, the librarian of the school, wants to store these books on shelves such that each shelf should have the same number of books of each subject. What should be the maximum number of books on each shelf?
22. A gardener has 150 marigold plants, 180 rose plants, and 210 tulip plants. He wants to plant them in rows such that each row has the same number of plants, and only one type of plant is planted in each row.
 - (a) Find the maximum number of plants in each row.
 - (b) Find the number of rows for each type of plant.

ANSWERS

1. B) The number is divisible by 6
2. C) 29
3. C) 15
4. D) 12
5. B) 36
6. B) 2
7. C) 24
8. C) The smallest prime number is 2
9. B) Divisible by 9
10. C) 30

11. Largest 4-digit number divisible by 4 and is also palindrome is 8888. The smallest 4-digit number divisible by 4 and is also palindrome is 2112

12. To find the maximum number of students in each group so that all students are included and each group has the same number of students, we need to find the HCF of the number of boys and girls.

The number of boys is 48, and the number of girls is 60.

$48 = 2 \times 2 \times 2 \times 2 \times 3$, $60 = 2 \times 2 \times 3 \times 5$. Therefore, $HCF = 2 \times 2 \times 3 = 12$. So, the maximum number of students in each group

13. No, 253 is not a prime number. It is a composite number because it has factors other than 1 and itself.

14. The smallest number of sweets that must be prepared is the LCM of 8 and 12. ($8 = 2 \times 2 \times 2$, $12 = 2 \times 2 \times 3$)
 $LCM = 2 \times 2 \times 2 \times 3 = 24$.

15. The prime factors of 84 are 2, 3, 7. It can be expressed as $2 \times 2 \times 3 \times 7$

16. By listing the number of factors, 12 is the smallest natural number having 6 factors.

17. The maximum number of students that can be in each row = HCF of the number of boys and the number of girls. Prime factorization of $480 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5$ and $360 = 2 \times 2 \times 2 \times 3 \times 3 \times 5$. $HCF = 2 \times 2 \times 2 \times 3 \times 5 = 120$ =
The maximum number of students in each row
Number of rows of boys: $Total\ boys / Students\ per\ row = 480 \div 120 = 4$

Number of rows of girls: $Total\ girls / Students\ per\ row = 360 \div 120 = 3$

There will be 4 rows of boys and 3 rows of girls.

18. To find the minimum number of biscuits and cakes, we find LCM of the number of items per box because the total number of biscuits and cakes must be a multiple of both 24 and 36. The prime factorization of $24 = 2 \times 2 \times 2 \times 3$ and $36 = 2 \times 2 \times 3 \times 3$. $LCM = 2 \times 2 \times 2 \times 3 \times 3 = 72$. Number of boxes of biscuits = $72/24 = 3$ boxes and the Number of boxes of cakes = $72/36 = 2$ boxes

19. To find the maximum number of identical clusters, we find the HCF of the number of red, blue, and yellow balloons. The prime factorization of each number is: $54 = 2 \times 3 \times 3 \times 3$, $81 = 3 \times 3 \times 3 \times 3$ and $108 = 2 \times 2 \times 3 \times 3 \times 3$. $HCF = 3 \times 3 \times 3 = 27$. This means the maximum number of clusters is 27. To determine the number of balloons of each colour per cluster, divide the total number of balloons of each colour by the number of clusters (27). So, Red balloons: $54 \div 27 = 2$, Blue balloons: $81 \div 27 = 3$ and Yellow balloons: $108 \div 27 = 4$

20. To be divisible by both 3 and 5, a number must be a multiple of their least common multiple (LCM).
 $LCM = 3 \times 5 = 15$

The number must also not be divisible by 2, which means it must be an odd number.

Then the smallest number that is divisible by both 3 and 5 but not by 2 is 15.

21. Given, number of English books = 780

and number of Science books = 364

The maximum number of books on each shelf, will be the product of the common factors of 780 and 364.

Prime factorization of $780 = 2 \times 2 \times 3 \times 5 \times 13$

Prime factorization of $364 = 2 \times 2 \times 7 \times 13$

Therefore, common factors of 780 and 364 are 2, 2 and 13 and the product of the common factors of 780 and 364 is $2 \times 2 \times 13 = 52$. Hence, the maximum number of books in each shelf = HCF of 780 and 364 = 52.

22. The maximum number of plants in each row is HCF of 150, 180, and 210. $150 = 2 \times 3 \times 5 \times 5$, $180 = 2 \times 2 \times 3 \times 3 \times 5$ and $210 = 2 \times 3 \times 5 \times 7$.

HCF = $2 \times 3 \times 5 = 30$. The maximum number of plants in each row is 30 plants.

(b) The number of rows for each type of plant is found by dividing the total number of plants of that type by the number of plants per row (30):

Number of marigold rows = $150/30 = 5$ rows, Number of rose rows = $180/30 = 6$ rows and Number of tulip rows = $210/30 = 7$ rows

XXXXXXXXXXXXXXXXXX

Class 6 – Mathematics

Chapter: Prime Time

Assignment (Competency-Based Questions)

Section A: Multiple Choice Questions (MCQs)

(Each question carries 1 mark — Total 10 marks)

1. Which of the following numbers is a prime number?

- a) 15 b) 21 c) 29 d) 39

2. The smallest prime number is:

- a) 0 b) 1 c) 2 d) 3

3. A number that has exactly two factors is called a:

- a) Even number b) Prime number c) Composite number d) Odd number

4. Which of the following is not a prime number?

- a) 5 b) 9 c) 7 d) 13

5. The prime factors of 30 are:

- a) 2, 3, 5 b) 3, 5, 6 c) 2, 5, 10 d) 2, 3, 15

6. The number 91 is:

a) Prime b) Composite c) Even d) None

7. The largest two-digit prime number is:

a) 97 b) 99 c) 95 d) 93

8. The product of the first three prime numbers is:

a) 6 b) 10 c) 30 d) 12

9. How many prime numbers are there between 1 and 20?

a) 6 b) 7 c) 8 d) 9

10. The HCF of 14 and 21 using prime factorization is:

a) 7 b) 14 c) 21 d) 3

Section B: 2 Marks Questions

(Any 5 questions — 2 marks each)

1. Find the prime factors of 84.
2. Write all prime numbers between 30 and 50.
3. Determine whether 51 is a prime or composite number.
4. Find the LCM of 12 and 18 using the prime factor method.
5. Express 72 as a product of its prime factors.
6. Write two twin prime pairs between 1 and 50.

Section C: 3 Marks Questions

(Any 5 questions — 3 marks each)

1. Find the HCF and LCM of 36 and 48 using prime factorization.
2. Show that the product of three consecutive numbers is always divisible by 6.
3. Write all prime factors of 120 and express it as a product of powers of primes.
4. Check whether 97 is a prime number or not.
5. Find the greatest number which divides 60, 75, and 90 exactly.
6. Find the smallest number that is exactly divisible by 8, 12, and 15.

Section D: Case Studies ($2 \times 5 = 10$ marks)

Case Study 1:

Riya has 36 red beads and 48 blue beads. She wants to make necklaces such that each necklace has equal numbers of red and blue beads, and no beads are left over.

- (a) What is the greatest number of necklaces she can make?
- (b) How many red and blue beads will each necklace have?

Case Study 2:

A school is organizing a drill for students.

There are 60 boys and 84 girls. They have to stand in rows such that each row has an equal number of boys and an equal number of girls.

Find:

- (a) The maximum number of rows possible.
- (b) The number of boys and girls in each row.

Competency Based Questions – Chapter: Prime Time (Class 6 Mathematics)

Multiple Choice Questions (1 mark each)

1. Which of the following is a prime number?
(a) 21 (b) 29 (c) 27 (d) 35
2. How many factors does a prime number have?
(a) 1 (b) 2 (c) 3 (d) More than 2
3. The smallest prime number is:
(a) 0 (b) 1 (c) 2 (d) 3
4. Which of the following is neither prime nor composite?
(a) 0 (b) 1 (c) 2 (d) 3
5. Which of these pairs are twin primes?
(a) 3 and 5 (b) 5 and 7 (c) 7 and 11 (d) 11 and 13
6. The number 49 is:
(a) Prime (b) Composite (c) Odd Prime (d) None
7. The product of two prime numbers is:
(a) Always prime (b) Always even (c) Sometimes composite (d) Always composite
8. The smallest even prime number is:
(a) 0 (b) 1 (c) 2 (d) 3
9. The greatest prime number between 1 and 20 is:
(a) 17 (b) 19 (c) 13 (d) 11
10. Which of the following numbers is divisible by both 2 and 3?
(a) 8 (b) 12 (c) 14 (d) 18

Short Answer Questions (2 marks each)

1. Define a prime number and give two examples.
2. Write all the prime numbers between 20 and 40.
3. Find the prime factorization of 84.
4. State any two differences between prime and composite numbers.
5. Find the LCM and HCF of 12 and 18 using prime factorization.

Short Answer Questions (3 marks each)

1. Express 90 as a product of its prime factors.
2. Find all factors of 36 and classify them as prime or composite.
3. Determine whether 97 is a prime number. Justify your answer.
4. Write all the prime numbers less than 50 and find their sum.
5. Explain how to find the HCF of 72 and 108 using the prime factorization method.

Case Study Based Questions

1. Rina is organizing gift packs. Each pack must contain the same number of chocolates and candies. She has 60 chocolates and 84 candies. Using prime factorization, find how many gift packs she can make so that each pack has equal items. Also, find how many chocolates and candies each pack will contain.
2. A teacher asked students to find a number which is divisible by both 12 and 18. Rahul said the number must be a multiple of their LCM, while Priya said it must be a multiple of their HCF. Who is correct and why? Find the required number using prime factorization.

WORK SHEET

CLASS 6 CHAPTER-5 (PRIME TIME)

1. Which of the following numbers is a factor of every number?
A) 0 B) 1 C) 2 D) The number itself
2. How many prime numbers are there between 20 and 40?
A) 4 B) 5 C) 6 D) 7
3. Which of the following pairs of numbers is a set of **co-prime** numbers?
A) 14 and 35 B) 18 and 25 C) 20 and 30 D) 12 and 15
4. A number is divisible by 6 if it is divisible by:
A) 2 and 4 B) 2 and 3 C) 3 and 4 D) 2 and 9
5. The smallest digit that should replace # in the number 56#32 to make it divisible by 9 is:
A) 0 B) 1 C) 2 D) 3
6. The prime factorisation of 72 is:

A) $2^2 \times 3^3 \times 1$ B) $2^3 \times 3^2$ C) 8×9 D) $2 \times 4 \times 9$
7. Which of the following statements about prime numbers is **incorrect**?

A) All prime numbers are odd. B) 2 is the smallest prime number.

C) A prime number has exactly two factors. D) There is only one even prime number.
8. The first three common multiples of 4 and 6 are:

A) 12, 24, 36 B) 4, 8, 12 C) 6, 12, 18 D) 2, 4, 6
9. Find the GREATEST COMMON FACTOR(HCF) of 28 and 42.

A) 2 B) 7 C) 14 D) 42
10. A number is divisible by 10 if its unit's digit is:

A) 5 B) 0 C) Any even number D) Any number except 0

SECTION B(2 marks)

1. Check the divisibility of the number 75816. Show the steps involved in applying the Divisibility rule.
2. Express the number 84 as a product of its prime factors using the factor tree Method.

3. Find the Greatest Common Factor (GCF) of 24 and 40 by listing all the factors for both numbers.
4. Are the numbers 15 and 22 co-prime? Justify your answer by finding their common factors.
5. Write the first six multiples of 5 and the first six multiples of 8. From these lists, find the Least Common Multiple (LCM) of 5 and 8.

SECTION C(3 marks)

1. Find the value of the digit P if the five-digit number 72P10 is divisible by both 3 and 5. Give one possible value for P.
2. Using the **Prime Factorisation Method**, find the Highest Common Factor of 84 and 90.
3. What is the **smallest number** that is a multiple of all the even numbers from 2 to 10?
4. Check the divisibility of the number 17824 by both 4 and 8.
5. Find the largest 3 digit number that is a multiple of 5 and leaves a remainder of 3 when divided by 4?

CASE BASED QUESTIONS

1. Ravi is walking home and passes by three traffic lights. He notices that the lights flash as follows:

- The first light changes every **45 seconds**.
- The second light changes every **60 seconds**.
- The third light changes every **75 seconds**.

Answer the following questions on the basis of the above informations.

1. What mathematical concept should we use to find the time interval at which all the three lights change together?
 2. At what interval do the three traffic lights change simultaneously?
 3. If all three lights change simultaneously at 7:00:00 AM, at what time will they change together again?
2. A teacher has 108 pencils and 144 erasers. She wants to distribute them among her students such that every student receives an **equal number** of pencils and an **equal number** of erasers. No stationery item should be left over.

Answer the following questions on the basis of the above informations.

1. What mathematical concept should the teacher use to find the maximum possible number of students that she can distribute them equally?
2. What is the maximum number of students the teacher can distribute the items to?
3. How many pencils will each student receive?
4. How many erasers will each student receive?

ANSWER KEY

SECTION A (1 mark)

1. B) 1
2. A) 4.
3. B) 18 and 25
4. B) 2 and 3
5. C) 2
6. B) $2^3 \times 3^2$
7. A) All prime numbers are odd (Incorrect statement)
8. A) 12, 24, 36
9. C) 14
10. B) 0

SECTION B (2 marks)

1. Divisibility of 75816

Rule of 2: last digit is 6 $\rightarrow$ divisible

Rule of 3: sum = $7+5+8+1+6 = 27$, divisible by 3

Hence 75816 is divisible by 2 and 3

2. Prime factorisation of 84 (Factor tree)

84

$\rightarrow 2 \times 42$

$\rightarrow 2 \times 2 \times 21$

$\rightarrow 2 \times 2 \times 3 \times 7$

Hence, $84 = 2^2 \times 3 \times 7$

3. GCF of 24 and 40

Factors of 24 = 1,2,3,4,6,8,12,24

Factors of 40 = 1,2,4,5,8,10,20,40

Common factors = 1,2,4,8

GCF = 8

4. Are 15 and 22 co-prime?

Factors of 15 = 1,3,5,15

Factors of 22 = 1,2,11,22

Common factor = 1 only

Yes, 15 and 22 are co-prime.

5. LCM of 5 and 8

Multiples of 5: 5,10,15,20,25,30,35,40. ...

Multiples of 8: 8,16,24,32,40,48.

Common = 40

LCM = 40

BbSECTION C (3 marks)

1. Value of P in 72P10 divisible by 3 and 5

Divisible by 5 $\rightarrow$ last digit = 0

Sum of digits = $7+2+P+1+0 = 10 + P$
For divisibility by 3 $\rightarrow 10+P$ divisible by 3
Possible P values: 2, 5, 8
One possible answer: $P = 2$

2. HCF of 84 and 90 by prime factorisation

$84 = 2^2 \times 3 \times 7$
 $90 = 2 \times 3^2 \times 5$
Common = $2 \times 3 = 6$
HCF = 6

3. Smallest number that is multiple of all even numbers from 2 to 10

Even numbers: 2,4,6,8,10
LCM = 120
Smallest number = 120

4. Divisibility of 17824 by 4 and 8

Last 2 digits = 24 $\rightarrow$ divisible by 4

Last 3 digits = 824 $\rightarrow$ divisible by 8
17824 divisible by both 4 and 8

5. Largest 3-digit number multiple of 5 leaving remainder 3 on division by 4

Let number = multiple of 5 $\rightarrow$ ends in 0 or 5
Check numbers down from 995:
 $\rightarrow 995 \div 4$ gives remainder 3
Answer = 995

CASE-BASED QUESTIONS

CASE 1 – Traffic Lights

1.LCM (Least Common Multiple)

2. Interval when all 3 lights change together

Find LCM of 45, 60, 75:

$$45 = 3^2 \times 5$$

$$60 = 2^2 \times 3 \times 5$$

$$75 = 3 \times 5^2$$

$$\text{LCM} = 2^2 \times 3^2 \times 5^2 = 4 \times 9 \times 25 = 900 \text{ seconds}$$

900 seconds (15 minutes)

3. Next time they change together

7:00 AM + 15 minutes $\rightarrow$ 7:15 AM

CASE 2 – Stationery Distribution

1. HCF (Highest Common Factor)

2. Maximum number of students

HCF(108,144)

$$108 = 2^2 \times 3^3$$

$$144 = 2^4 \times 3^2$$

$$\text{HCF} = 2^2 \times 3^2 = 4 \times 9 = 36$$

36 students

3. Number of pencils each student gets

$$108 \div 36 = 3$$

4. Number of erasers each student gets

$$144 \div 36 = 4$$

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CLASS VI

WORKSHEET ON PERIMETER AND AREA

SECTION A (10 questions of 1 mark each)

- 1 What is the perimeter of a square with a side length of 5cm?
a) 10 cm b) 20cm c) 40cm d) 25cm
- 2 The perimeter of a rectangle is 24 cm, and its length is 4 cm. What is its breadth?
a) 8cm b) 6cm c) 3cm d) 20cm
- 3 If a square has a perimeter of 36 cm, what is the length of one of its sides?
a) 12cm b) 18cm c) 9cm d) 6cm
- 4 A square park has a side length of 75 m. An athlete runs around it twice.
What distance does the athlete cover?
a) 300m b) 150m c) 600m d) 5625m
- 5 What is the area of a square whose perimeter is 40 cm?
a) 1600 sq cm b) 100 sq.cm c) 160 sq.cm d) 400 sq.cm
- 6 A wire is in the shape of a rectangle with length 10 cm and width 8 cm.
If the same wire is bent into the shape of a square, what would be the side length of the square?
a) 36cm b) 9cm c) 18cm d) 6cm
- 7 Which of the following statements is true?
a) Perimeter is measured in square units
b) Area is the distance around a shape
c) The perimeter of a regular hexagon with side 'a' is 6a
d) All rectangles with the same perimeter have the same area
- 8 A path 2 meters wide runs along the inside of a square park of side 10 meters.
What is the area of the path?
a) 64 sq.m b) 36 sq.m c) 32 sq.m d) 24 sq.m
- 9 A triangle has a perimeter of 24 cm. If two of its sides are 8 cm and 9 cm, what is the length of the third side?
a) 7cm b) 16cm c) 15cm d) 8cm
- 10 What is the perimeter of a regular pentagon with each side measuring 4 cm?
a) 16cm b) 20cm c) 24cm d) 40cm

SECTION B (5 questions of 2 marks each)

- 11 A wire of length 36 cm is bent into the shape of an equilateral triangle. What is

the length of each side of the triangle?

- 12 If the perimeter of a square is 64 cm, find its area.
- 13 A rectangular park is 100 m long and 40 m wide. A farmer wants to fence it with 3 rounds of wire. What is the total length of wire needed?
- 14 A piece of string is 40 cm long. What will be the length of each side if the string is used to form a square?
- 15 Find the perimeter of a regular hexagon with each side measuring 6 cm.

SECTION C (5 questions of 3 marks each)

- 16 The floor of a room is 400 cm wide and 5 m long. Square tiles with a side length of 2m are used to cover the floor. How many tiles are needed?
- 17 A rectangular swimming pool is 50 m long and 30 m wide. A safety rope needs to be placed along its boundary. If the rope costs ₹15 per m., what is the total cost of the rope needed?
- 18 The area of a rectangular plot of land is 300 square meters. If the length of the plot is 20 meters, calculate its perimeter.
- 19 Reena and Rahul are comparing two photo frames. Reena's frame is a square with a side length of 25 cm. Rahul's frame is a rectangle with dimensions 30 cm by 20 cm. Whose frame has a larger area, and what is the difference in their areas?
- 20 A carpenter is making a wooden frame for a picture. The picture measures 40 cm by 30 cm. The frame is 2 cm wide around the entire picture. Find the outer perimeter of the picture frame.

SECTION D (2 case study questions of 4 marks each)

- 21 Aman and Riya decide to make walking part of their daily routine.
- Aman walks around a square park with each side measuring 100 meters.
 - Riya walks around a rectangular park that is 120 meters long and 80 meters wide.

Based on this information, answer the following questions:

- i) What distance does Aman cover in one complete round? (1 Mark)
- ii) What distance does Riya cover in one complete round? (1 Mark)
- iii) If Aman completes 5 rounds and Riya completes 3 rounds, who covers more total distance and by how much? (2 Marks)

22 A municipality workers team is marking two different play areas on a large paved field using white paint.

- Area A is a square area for a hopscotch game, with a side of 4 meters.
- Area B is a rectangular area for a relay race, with a length of 10 meters and a width of 2 meters.

Based on this information, answer the following questions:

- i) Which area has a larger perimeter, and what is that perimeter? (1 Mark)
- (ii) Which area has a larger area, and what is that area? (1 Mark)
- (iii) The team needs 1 liter of paint to mark every 4 meters of line. How many liters of paint are needed to mark the boundary of the square Area A and rectangular Area B? (2 Marks)

ANSWER KEY

- 1 B
- 2 A
- 3 C
- 4 C
- 5 B
- 6 D
- 7 C
- 8 B
- 9 A
- 10 B

11 Perimeter of equilateral triangle = $3 \times \text{side}$ (1)

$$3 \times \text{side} = 36, \quad \text{side} = 12\text{cm} \quad (1/2 + 1/2)$$

12 Perimeter of square = $4 \times \text{side}$ (1/2)

$$4 \times \text{side} = 64 \quad \text{side} = 16\text{cm} \quad (1/2)$$

$$\text{Area} = \text{side} \times \text{side} = 16 \times 16 = 256 \text{ sq.cm} \quad (1)$$

13 Perimeter of rectangle = $2 \times (l + b) = 2 \times (100 + 40) = 280\text{m}$ (1)

$$\text{Wire needed for 3 rounds} = 3 \times 280 = 840\text{m} \quad (1)$$

14 Perimeter of square = $4 \times \text{side} = 40$, side = 10cm (1+1)

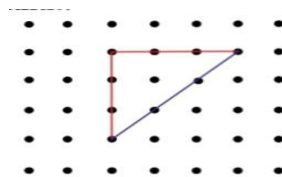
15 Perimeter of regular hexagon = $6 \times \text{side} = 6 \times 6 = 36\text{cm}$ (1+1)

- 16 Area of floor= $l \times b = 5 \times 4 = 20$ sq m (1)
 Area of one tile= $\text{side} \times \text{side} = 2 \times 2 = 4$ sq m (1)
 No. of tiles = $20/4 = 5$ tiles (1)
- 17 Perimeter of rectangle= $2 \times (l+b) = 2 \times (50+30) = 160$ m (1 ½)
 Cost= $15 \times 160 = \text{Rs.} 2400$ (1 ½)
- 18 area= $l \times b = 300$ (1)
 $20 \times b = 300$ $b = 15$ m (1)
 $P = 2 \times (l+b) = 2 \times (20+15) = 70$ m (1)
- 19 area of square= $\text{side} \times \text{side} = 25 \times 25 = 625$ sq cm (1)
 Area of rectangle= $l \times b = 30 \times 20 = 600$ sq cm (1)
 Reena's frame has larger area. Difference= 25 sq cm (1)
- 20 total length = $40+2+2 = 44$ cm (1)
 Total breadth= $30+2+2 = 34$ cm (1)
 $P = 2 \times (l+b) = 2 \times (44+34) = 156$ cm (1)
- 21 (i) perimeter of square = $4 \times \text{side} = 4 \times 100 = 400$ m (1)
 (ii) perimeter of rectangle= $2 \times (l+b) = 2 \times (120+80) = 400$ m (1)
 (iii) distance covered by Aman in 5 rounds= 2000 m
 Distance covered by Riya in 3 rounds= 1200 m
 Aman covered 800 m more (2)
- 22 (i) Perimeter of A= $4 \times 4 = 16$ sq m, Perimeter of B= $2 \times (10+2) = 24$ sq m
 Area B has larger perimeter (1)
 (ii) area of A= $4 \times 4 = 16$ sq m, area of B= $10 \times 2 = 20$ sq m
 Area B has larger area (1)
 (iii) paint for area A= $16/4 = 4$ litres, paint needed for area B= $24/4 = 6$ litres
 Total quantity= 10 litres (2)

WORKSHEET - CLASS VI PERIMETER AND AREA

SECTION A (MCQ)

- 1) A regular pentagon has 5 sides, each of length 6 cm. Its perimeter is:
A) 24 cm B) 30 cm C) 36 cm D) 40 cm
- 2) The area of a square whose side is 8 cm is:
A) 16 cm^2 B) 64 cm^2 C) 32 cm^2 D) 24 cm^2
- 3) Regular polygon has all sides equal and all angles _____.
A) Different B) Unequal C) Equal D) Right angles only
- 4) What is the perimeter of the given figure



- a) $(6s+3d)$ units b) $(3s+6d)$ units c) $9d$ units d) $9s$ units
- 5) Find the distance travelled by Seetha, if she takes 4 rounds of a square park of side 8 m
A) 256 m B) 128m C) 32m D) 36m
- 6) The perimeter of a triangle of side 2 cm ,3 cm and 4 cm is
A) 9cm B) 18cm C) 27cm D) 36cm
- 7) The area of a rectangular sheet of paper is 24 cm^2 square its length is 6 cm find its width
A) 8cm B) 6cm C) 18cm D) 4cm
- 8) A triangle has perimeter of 20 cm if two of its sides are 8 cm and 6 cm what is the length of the third
A) 4cm B) 6cm C) 8cm D) 10cm
- 9) If the side of a square is doubled, its area becomes:
A) 2 times B) 3 times C) 4 times D) 8 times
- 10) The cost of flooring a room at RS 25 per m^2 is RS.625. The area of the floor is
A) 25 cm^2 B) 15 cm^2 C) 50 cm^2 D) 5 cm^2

SECTIN B (2 MARKS)

- 11) Two equal sides of an isosceles triangle measures 10 cm each find the length of its third side if its perimeter is 32 cm
- 12) Perimeter of a rectangle is 24 cm and its length is 7cm, find its breadth.
- 13) A picture frame is 20cm long and 15cm wide , find the length of the ribbon needed to decorate its boundary.
- 14) What is the perimeter of an equilateral triangle with the side of length 6 cm?
- 15) Perimeter of a square park is 200 m. What is the side of the square park?

SECTIN C (3 MARKS)

- 16) Draw a rectangle with the length of 10 units and a width of 5cm. Calculate the perimeter and area of the rectangle

- 17) A rectangular field has a length of 50m and a breadth of 30m. If a path 2m wide is built around the field what is the area of the path?
- 18) A square shaped playground has a side length 150 m the cost of fencing the playground is RS 12 per metre what will be the total cost of fencing ?
- 19) The floor of a room is 8m long and 6m wide , each tile used is $40\text{cm} \times 40\text{cm}$. How many tiles are required to cover the floor completely
- 20) Two rectangular park have the same area of 300 m^2 . The first park has a length of 25m. Find the width of both parks if the second park is 30m long. Which park has a larger perimeter?

CASE STUDY

Case Study 1: Garden Fencing

Ravi has a rectangular garden that measures 20 m long and 15 m wide. He wants to put a fence all around it and also grow grass inside the garden.

- i. What is the perimeter of the garden?
- ii. How much wire will he need to fence it once around?
- iii. What is the area of the garden?
- iv. If 1 m^2 of grass costs ₹15 to grow, how much will he spend to cover the whole garden with grass?

Case Study 2 : TILE FLOORING

A kitchen floor is 800 cm long and 600 cm wide. Each tile used is a square of side 40 cm.

- i. Find the area of one tile in cm^2 .
- ii. How many tiles are needed to cover the whole floor?
- iii. If one tile costs ₹25, find the total cost of tiling the floor.
- iv. Find the perimeter of the floor.

ANSWERS

- 1) (B) 30 cm
- 2) (B) 64 cm^2
- 3) (C) Equal
- 4) $(6s+3d)$ units
- 5) (B) 128 m
- 6) (A) 9cm
- 7) (D) 4cm
- 8) (B) 6cm
- 9) (C) 4 times
- 10) (A) 25 cm^2
- 11) Perimeter of an isosceles triangle = 32

$$10+10+\text{third side}=32$$

$$20+ \text{third side}= 32$$

$$\text{Third side}=32-20=12 \text{ cm}$$

$$12) \text{ perimeter of a rectangle} = 24 \text{ cm}$$

$$2 \times (\text{length} + \text{breadth}) = 24 \text{ cm}$$

$$2 \times (7 + b) = 24$$

$$7 + b = 12$$

$$b = 12 - 7$$

$$= 5 \text{ cm}$$

$$13) \text{ The length of the ribbon needed} = \text{perimeter of the rectangle}$$

$$2 \times (l + b) = 2 \times (10 + 15) = 2 \times 25 = 50 \text{ cm}$$

$$14) \text{ perimeter of an equilateral triangle} = 3 \times \text{length of one side}$$

$$= 3 \times 6 \text{ cm} = 18 \text{ cm}$$

$$15) \text{ perimeter of square Park} = 200 \text{ m}$$

$$4 \times \text{side} = 200$$

$$\text{Side} = 200 \div 4 = 50 \text{ m}$$

$$16) \text{ perimeter of the rectangle} = 2 \times (l + b) = 2 \times (10 + 5)$$

$$= 2 \times 15 = 30 \text{ cm}$$

$$\text{Area of the rectangle} = l \times b$$

$$= 10 \times 5 = 50 \text{ cm}^2$$

$$17) \text{ Field length} = 50 \text{ m} \text{ breadth} = 30 \text{ m}, \text{ Path} = 2 \text{ m wide}$$

$$\text{Outer dimensions (add path on all sides)}$$

$$\text{Length} = 50 + 2 + 2 = 54 \text{ m}$$

$$\text{Breadth} = 30 + 2 + 2 = 34 \text{ m}$$

$$\text{Area of outer rectangle} = 54 \times 34 = 1836 \text{ m}^2$$

$$\text{Area of field} = 50 \times 30 = 1500 \text{ m}^2$$

$$\text{Area of path} = 1836 - 1500 = 336 \text{ m}^2$$

$$18) \text{ Side} = 150 \text{ m}, \text{ Cost per metre} = ₹12$$

$$\text{Perimeter} = 4 \times \text{side} = 4 \times 150 = 600 \text{ m}$$

$$\text{Total cost of fencing} = 600 \times 12 = ₹7200$$

$$19) \text{ Given: Room length} = 8 \text{ m}, \text{ breadth} = 6 \text{ m}, \text{ Tile} = 40 \text{ cm} \times 40 \text{ cm}$$

$$\text{Convert tile to metres: } 40 \text{ cm} = 0.4 \text{ m}$$

$$\text{Area of room} = 8 \times 6 = 48 \text{ m}^2$$

$$\text{Area of one tile} = 0.4 \times 0.4 = 0.16 \text{ m}^2$$

$$\text{Number of tiles required} = 48 \div 0.16 = 300$$

$$20) \text{ Given: Area of both park} = 300 \text{ m}^2$$

$$\text{First park: length} = 25 \text{ m}$$

$$\text{Width} = 300 \div 25 = 12 \text{ m}$$

$$\text{Perimeter} = 2(25 + 12) = 2 \times 37 = 74 \text{ m}$$

Second park: length = 30 m

Width = $300 \div 30 = 10$ m

Perimeter = $2(30 + 10) = 2 \times 40 = 80$ m

Widths are 12 m and 10 m respectively.

The second park has the larger perimeter (80 m).

CASE STUDY

21) Given: Garden = 20 m $\times$ 15 m

i) Perimeter = $2(20 + 15) = 70$ m

ii) Wire needed to fence once = 70 m

iii) Area = $20 \times 15 = 300$ m²

iv) Cost of growing grass = $300 \times ₹15 = ₹4500$

22) i) area of one tile = 1600 cm²

ii) number of tiles required = area of floor $\div$ area of tile
 $= 480000 \div 1600$
 $= 300$

iii) Total cost = $300 \times 25 = ₹7500$

iv) Perimeter of the floor = $2 \times (l+b)$
 $= 2 \times (800+600)$
 $= 2800$ cm

SARANYA S PILLAI

TGT MATHS

PM SHRI KV CHENNEERKARA

Part 1 (MCQ)

Q1. The perimeter of an equilateral triangle is.

- (a) $2 \times$ length of one side
- (b) $3 \times$ length of one side
- (c) length of one side $\times$ length of another side
- (d) length of one side + base

Q2. A piece of string is 36 cm long. Forming a square, each side will be

- (a) 6 cm (b) 9 cm (c) 12 cm (d) 18 cm

Q3. A triangle has sides of 5 cm, 6 cm, and 7 cm. Its perimeter is

- (a) 16 cm (b) 18 cm (c) 19 cm (d) 20 cm

Q4. A hexagon with a total perimeter of 24 cm has each side equal to

- (a) 4 cm (b) 6 cm (c) 8 cm (d) 3 cm

Q5. The area of square is 100 cm². Its side is

- (a) 20 cm (b) 5 cm (c) 10 cm (d) 10.5 cm

Q6. The length and breadth of a rectangle are 10 cm and 8 cm respectively. If its length is doubled, then its new area is

- (a) 160 cm (b) 80 cm² (c) 160 cm² (d) None of these

Q7. What do you call the total boundary length of a closed figure?

- (a) Area (b) Volume (c) Perimeter (d) Region

Q8. What is the amount of surface enclosed by a closed figure called?

- (a) Volume (b) Area (c) Space (d) Perimeter

Q8. An isosceles triangle has a measure of p units for its equal sides and q units for its unequal side. What is its perimeter?

- (a) $2(p + q)$ units
- (b) $2p + q$ units
- (c) $2q + p$ units
- (d) $2(q + p)$ units

Q9. A wooden plank measures 6 m in length and 3 m in breadth. If five such wooden planks are arranged in order, what is the area occupied by them?

- (a) 18 sq. m (b) 90 sq. m (c) 5 sq. m (d) 95 sq. m

Q10. The side of a square is 6 cm. If its side is doubled, then its new perimeter is

- (a) 48 cm (b) 36 cm (c) 60 cm (d) 24 cm

Part 2 (2 marks)

- Q1. Length of a rectangular field is 12m and breadth is 8m. Find the perimeter of the rectangular field.
- Q2. Two sides of a triangle are 12cm and 14 cm. If the perimeter of the triangle is 36 cm, find the third side.
- Q3. The area of a rectangular garden is 2900 sq. If its breadth is 29m, find the length of the garden?
- Q4. Two square stamps of side 1.5 cm are joined together. Find the area required to paste these two stamps?
- Q5. A piece of string is 80 cm. What will be the length of each side if the string is used to form a square?

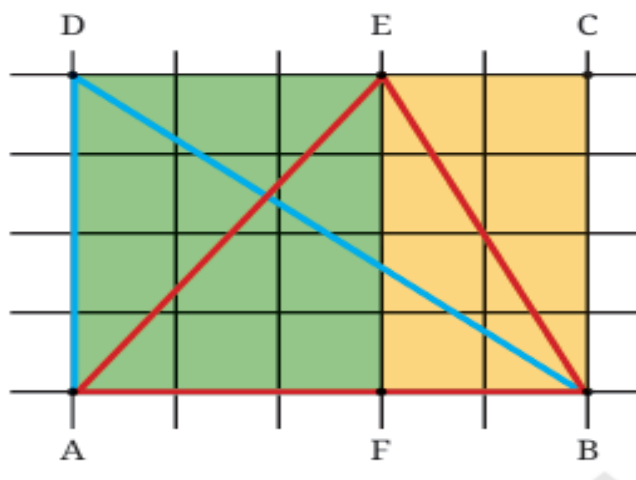
Part 3(3marks)

- Q1. How many envelopes can be made out of a sheet of paper 125cm by 85cm supposing one envelope require a piece of paper of side 17cm by 5cm.
- Q2. Rahul walks around a square park once and covers 800m. What will be the area of the park?
- Q3. Which play ground has bigger area? One that measures 50 m by 40 m and another that measures 75 m by 20 m.
- Q4. What is the length of the wooden strip required to frame a photograph of length and breadth 32 cm and 22 cm?
- Q5. Gita runs 10 times around a square field of side 55 m and Sita runs 5 times around a rectangular field of length 45 m and breadth 35m. Who covers more distance and by how much?

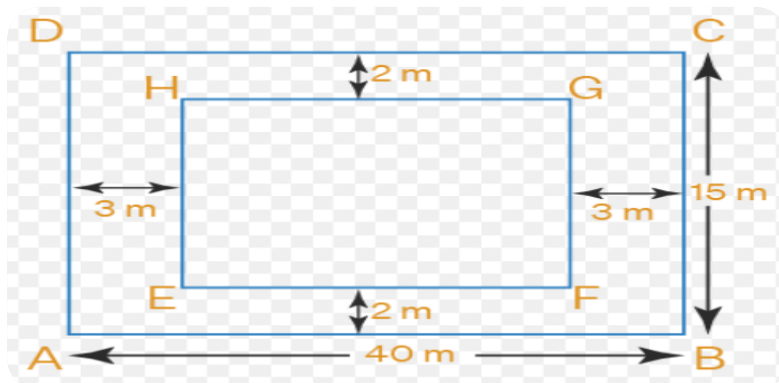
Part 4 (4marks)

- Q1. ABCD is a rectangular garden made up of small squares having side 1cm in which ABD and ABE are two triangular part.

- (a) Find the area of triangle ABD.
- (b) Find the area of triangle ABE.
- (c) Find the area of rectangle ABCD.
- (d) How area of triangle ABD is related to area of rectangle ABCD?



Q2. Rahul is the president of his school's gardening club and wants to design a new garden in the school premises. The school has allocated a rectangular plot of land for this purpose. The length is labelled as 40 m and the width (breadth) as 15 m. Rahul decides to use an another small rectangular section within the main garden for growing special medicinal herbs. The dimensions of this inside rectangular section are 34cm $\times$ 11cm.



Based on this information and the figure, answer the following questions:

- What is the perimeter of the entire rectangular garden?
- What is the total area of the entire rectangular garden?
- What is the area of the small square section designated for medicinal herbs?
- What is the area of the remaining part of the garden that is not used for the herb section?

VIJAY LAXMI

TGT MATHS

PM SHRI KV NO. 2 NAVAL BASE KOCHI.

Competency-Based Worksheet: Perimeter and Area

Class 6 Mathematics (Based on Ganita Prakash)

Instructions:

- Section A consists of 10 multiple-choice questions (1 mark each).
 - Section B consists short answer questions (2 marks each).
 - Section C consists of 5 problem-solving questions (3 marks each).
 - Section D consists of 2 case-study questions (5 marks each, with sub-parts).
-

Section A: Multiple Choice Questions (10 x 1 = 10 Marks)

Choose the correct option for each question.

1. To find the cost of fencing a park, you need to measure its:
 - (a) Area
 - (b) Perimeter
 - (c) Length only
 - (d) Volume
2. The area of a square is 100 sq. cm. What is its perimeter?
 - (a) 10 cm
 - (b) 400 cm
 - (c) 40 cm
 - (d) 100 cm
3. A rectangular carpet is 3 m long and 200 cm wide. What is its area?
 - (a) 600 sq. m
 - (b) 6 sq. m
 - (c) 60 sq. m
 - (d) 60000 sq. cm
4. A boy runs twice around a square field with a side of 50 m. What is the total distance he covers?
 - (a) 200 m
 - (b) 400 m
 - (c) 100 m

(d) 2500 m

5. The perimeter of a regular pentagon (5-sided figure) is 25 cm. What is the length of one side?

(a) 125 cm

(b) 10 cm

(c) 5 cm

(d) 20 cm

5. Two rectangles, A and B, have the same area. Rectangle A is long and thin. Rectangle B is a square. Which rectangle has the smaller perimeter?

(a) Rectangle A

(b) Rectangle B

(c) Both are equal.

(d) Cannot be determined.

6. What happens to the area of a square if its side is doubled?

(a) It becomes double

(b) It becomes half

(c) It becomes four times

(d) It remains the same

7. The area of a rectangle is 48 sq. m. If its length is 8 m, its breadth is:

(a) 6 m

(b) 12 m

(c) 384 m

(d) 40 m

8. Which figure has a larger perimeter?

(a) A square of side 5 cm

(b) A rectangle of 6 cm length and 4 cm breadth

(c) Both are equal

(d) Cannot be determined

9. The shape of your mathematics book is a rectangle. To find the length of a ribbon needed to cover its edge, you will find its:

(a) Area

- (b) Perimeter
 - (c) Length X Breadth
 - (d) Area + Length
-

Section B: Short Answer Questions (7 x 2 = 10 Marks)

11. Find the area of a square park whose perimeter is 320 m.
 12. A rectangular piece of land measures 0.7 km by 0.5 km. How much wire is needed to fence it with 4 rows of wire?
 13. The area of a rectangular garden is 240 sq. m. If its breadth is 12 m, find its length and perimeter.
 14. A room is 5 m long and 4 m wide. What is the cost of carpeting the room if the carpet costs ₹250 per square meter?
 15. The area of a square is 144 cm². If a new square is created with half the side length of the original square, what will be the area of the new square?
-

Section C: Problem-Solving Questions (5 x 3 = 15 Marks)

16. A wire is in the shape of a rectangle of length 18 cm and breadth 12 cm. If the same wire is bent into a square, what will be the side of the square? Which shape encloses more area?
 17. How many square tiles of side 50 cm will be needed to tile a rectangular hall of length 8 m and breadth 5 m?
 18. A farmer has a rectangular field 30 m long and 25 m wide. He wants to leave a path 2 m wide all around the *inside* of the field for walking. What is the area of the field where he can grow crops (the inner area)?
 19. A rope of length 54 cm is cut into two pieces. One piece is used to form a square of side 6 cm. The other piece is bent into a regular hexagon. What is the length of each side of hexagon?
 20. Two plots of land have the same perimeter. One is a square of side 20 m. The other is a rectangle of length 25 m. Which plot has a greater area and by how much?
-

Section D: Case Study Based Questions (2 x 5 = 10 Marks)

21. A school is building a new rectangular playground. The playground is 60 meters long and 40 meters wide. They decide to build a 2-meter wide running track *around the outside* of the playground.
 - a) What is the area of the playground itself (the inner rectangle)? (1 mark)

- b) What are the length and breadth of the *outer* boundary (including the track)? (2 marks)
- c) What is the total cost of paving the running track if the cost of paving is ₹180 per square meter? (2 marks)

22. Anjali makes a rectangular painting on a piece of cardboard that is 40 cm long and 30 cm wide. She leaves a margin (border) of 3 cm *inside* all around the cardboard. She will only paint in the central area.

- a) What is the total area of the cardboard? (1 mark)
- b) What is the length of the area she will paint? (1 mark)
- c) What is the breadth of the area she will paint? (1 mark)
- d) What is the area of the margin (the unpainted border)? (2 marks)

Answers

1. **(b) Perimeter**
2. **(c) 40 cm**
3. **(b) 6 sq. m**
4. **(b) 400 m**
5. **(c) 5 cm**
6. **(b) Rectangle B**
7. **(c) It becomes four times**
8. **(a) 6 m**
9. **(c) Both are equal**
10. **(b) Perimeter**

11. Perimeter = 320 m

$$\text{Side of square} = \text{Perimeter} / 4 = 320 / 4 = 80 \text{ m}$$

$$\text{Area} = \text{side} \times \text{side} = 80 \text{ m} \times 80 \text{ m} = 6400 \text{ sq. m}$$

12. Perimeter of land = $2 \times (\text{Length} + \text{Breadth}) = 2 \times (0.7 \text{ km} + 0.5 \text{ km})$
 $= 2 \times (1.2 \text{ km}) = 2.4 \text{ km}$

This is for 1 row of wire.

$$\text{Wire needed for 4 rows} = 4 \times 2.4 \text{ km} = 9.6 \text{ km (or 9600 m)}$$

13. Area = 240 sq. m, Breadth = 12 m

$$\text{Length} = \text{Area} / \text{Breadth} = 240 / 12 = 20 \text{ m}$$

$$\text{Perimeter} = 2 \times (\text{Length} + \text{Breadth}) = 2 \times (20 + 12) = 2 \times 32 = 64 \text{ m}$$

$$14. \text{ Area of the room} = \text{Length} \times \text{Breadth} = 5 \text{ m} \times 4 \text{ m} = 20 \text{ sq. m}$$

$$\text{Cost of carpeting} = \text{Area} \times \text{Cost per sq. m} = 20 \times 250 = ₹ 5000$$

15.

- **Original Side:** The area of the original square 144 cm^2

$$\text{Area} = \text{side} \times \text{side}$$

$$\text{the side length is } 144 = \text{Area} / \text{Side} = 144 / 12 \text{ cm} = 12 \text{ cm}.$$

- **New Side:** The new square has half this side length, so its side is $12 \text{ cm} / 2 = 6 \text{ cm}$.
- **New Area:** The area of the new square is $6 \text{ cm} \times 6 \text{ cm} = 36 \text{ cm}^2$.

Section C: Problem-Solving Questions (15 Marks)

$$16. \text{ Perimeter of rectangle (length of wire)} = 2 \times (18 + 12) = 2 \times 30 = 60 \text{ cm}$$

The wire is bent into a square.

$$\text{Perimeter of square} = 60 \text{ cm}$$

$$\text{Side of the square} = 60 / 4 = 15 \text{ cm}$$

$$\text{Area of rectangle} = 18 \times 12 = 216 \text{ sq. cm}$$

$$\text{Area of square} = 15 \times 15 = 225 \text{ sq. cm}$$

Therefore The square encloses more area.

$$17. \text{ Area of hall} = 8 \text{ m} \times 5 \text{ m} = 40 \text{ sq. m}$$

$$\text{Side of tile} = 50 \text{ cm} = 0.5 \text{ m}$$

$$\text{Area of one tile} = 0.5 \text{ m} \times 0.5 \text{ m} = 0.25 \text{ sq. m}$$

$$\text{Number of tiles} = (\text{Area of hall}) / (\text{Area of one tile}) = 40 / 0.25 = 160 \text{ tiles}$$

$$18. \text{ Outer Length} = 30 \text{ m}, \text{ Outer Breadth} = 25 \text{ m}$$

A 2 m path is inside the field.

$$\text{Inner Length (for crops)} = 30 \text{ m} - 2 \text{ m} - 2 \text{ m} = 26 \text{ m}$$

$$\text{Inner Breadth (for crops)} = 25 \text{ m} - 2 \text{ m} - 2 \text{ m} = 21 \text{ m}$$

$$\text{Area for crops} = \text{Inner Length} \times \text{Inner Breadth} = 26 \text{ m} \times 21 \text{ m} = 546 \text{ sq. m}$$

$$19. \text{ Area of the large outer rectangle} = 12 \text{ m} \times 10 \text{ m} = 120 \text{ sq. m}$$

$$\text{Area of the inner "cut-out" rectangle} = 8 \text{ m} \times 6 \text{ m} = 48 \text{ sq. m}$$

Area of the L-shape = $120 - 48 = 72$ sq. m

20. Plot 1 (Square):

Side = 20 m

Perimeter = $4 \times 20 = 80$ m

Area = $20 \times 20 = 400$ sq. m

Plot 2 (Rectangle):

Perimeter = 80 m (same as square), Length = 25 m

Perimeter = $2 \times (\text{Length} + \text{Breadth})$

ie $80 = 2 \times (25 + \text{Breadth})$

$40 = 25 + \text{Breadth}$

Breadth = 15 m

Area = $25 \times 15 = 375$ sq. m

Answer: The square plot has a greater area by $(400 - 375) = 25$ sq. m .

Section D: Case Study Based Questions

Case Study 1: The School Playground

a) **Area of the playground** = $60 \text{ m} \times 40 \text{ m} = 2400$ sq. m

b) Outer Length = $60 \text{ m} + 2 \text{ m (left)} + 2 \text{ m (right)} = 64 \text{ m}$

Outer Breadth = $40 \text{ m} + 2 \text{ m (top)} + 2 \text{ m (bottom)} = 44 \text{ m}$

c) **Area of the outer rectangle** = $64 \text{ m} \times 44 \text{ m} = 2816$ sq. m

Area of the running track = (Area of outer rectangle) - (Area of playground)

= $2816 - 2400 = 416$ sq. m

Total cost = Area of track $\times$ Rate = $416 \times 180 = ₹74,880$

Case Study 2: Anjali's Painting

a) **Total area of the cardboard** = $40 \text{ cm} \times 30 \text{ cm} = 1200$ sq. cm

b) **Length of painted area** = $40 \text{ cm} - 3 \text{ cm (left)} - 3 \text{ cm (right)} = 34 \text{ cm}$

c) **Breadth of painted area** = $30 \text{ cm} - 3 \text{ cm (top)} - 3 \text{ cm (bottom)} = 24 \text{ cm}$

d) **Area of the painted part** = $34 \text{ cm} \times 24 \text{ cm} = 816$ sq. cm

Area of the margin = (Total area) - (Painted area)

= $1200 - 816 = 384$ sq. cm

Fractions Worksheet

Multiple Choice Questions (1 mark each – 10 Questions)

- Which of the following is a proper fraction?
a) $5/3$ b) $3/7$ c) $9/9$ d) $8/4$
- The fraction equivalent to $2/3$ is —
a) $4/9$ b) $6/9$ c) $3/2$ d) $8/9$
- Simplest form of $12/20$ is —
a) $3/5$ b) $2/5$ c) $4/10$ d) $6/10$
- $5/8 + 3/8 = ?$
a) $2/8$ b) $1/8$ c) 1 d) $8/8$
- Which of these fractions is greater?
a) $4/5$ b) $3/4$ c) $2/3$ d) $1/2$
- $7/9 - 2/9 = ?$
a) $9/9$ b) $5/9$ c) $2/7$ d) $9/7$
- If one roti (bread) is divided equally among 6 children, each child gets one-sixth. Which of the following statements is true?
a) $1/6$ is greater than $1/4$ b) $1/4$ is greater than $1/6$ c) $1/6$ is equal to $1/4$
d) $1/6$ is less than $1/10$
- Which of the following is an improper fraction?
a) $7/8$ b) $9/6$ c) $4/5$ d) $3/10$
- $2\frac{3}{5}$ in improper form is —
a) $13/5$ b) $12/5$ c) $11/5$ d) $10/5$
- A chocolate bar is divided into 8 equal parts. You eat 3 parts. What fraction of the chocolate bar remains?
a) $3/8$ b) $5/8$ c) $1/8$ d) $2/8$

2-Mark Questions

- Find two fractions equivalent to $4/7$.
- Reduce $30/45$ to its simplest form.
- Add $2/9 + 4/9$.
- Subtract $5/8$ from $7/8$.
- Convert $9/4$ into a mixed fraction.

3-Mark Questions

- Arrange the fractions $2/3$, $3/5$, $4/7$ in ascending order.
- Ramesh ate $2/5$ of a cake and his friend ate $1/5$. What fraction of the cake did they eat together?
14. A ribbon is $7/8$ m long. If $3/8$ m is cut off, how much is left?
- A boy walks $3/4$ km in the morning and $2/5$ km in the evening. Find the total distance he walks in a day.
- Simplify and express as a mixed fraction: $15/4 + 9/4$.

Case Study Questions ($2 \times 4 = 8$ marks)

Case Study 1 — Pizza Party

Three friends shared a large pizza.

- Rani ate $\frac{1}{4}$ of it.
- Ravi ate $\frac{2}{8}$.
- Sita ate the remaining part.

Answer the following:

1. Who ate the least pizza?
2. How much pizza did Rani and Ravi eat together?
3. What fraction of the pizza was left for Sita?
4. Was the pizza shared equally among them? Justify.

Case Study 2 — Water Tank Problem

A water tank has a capacity of 200 liters.

In the morning, it is filled up to $\frac{3}{5}$ of its capacity. Later, $\frac{2}{5}$ of the tank's capacity is used for gardening.

Answer the following:

1. How many liters of water were in the tank in the morning?
2. How much water was used for gardening?
3. What fraction of the tank is still full?
4. How many liters of water remain?

Anjana G Krishna

Tgt Maths

PM SHRI KV CHENNEERKARA

CLASS 6

CHAPTER 7 – FRACTIONS

SECTION A (1 mark each)

1. The recipe for a cake requires $\frac{3}{4}$ cup of sugar. If a baker wants to make three identical cakes, which calculation correctly finds the total amount of sugar needed?

A. $\frac{3}{4} + 3$

B. $\frac{3}{4} \times 3$

C. $\frac{3}{4} + \frac{3}{4} + \frac{3}{4} + 3$

D. $3 \div \frac{3}{4}$

2. Priya ate $\frac{2}{5}$ of a pizza, and Rahul ate $\frac{3}{10}$ of the same pizza. Who ate more pizza?

A. Rahul, because 3 is greater than 2.

B. Priya

C. Both ate the same amount.

D. It cannot be determined without knowing the size of the pizza.

3. A rectangle is divided into 12 equal parts, and 9 parts are shaded. Which of the following fractions is not equivalent to the shaded portion?

A. $\frac{9}{12}$

B. $\frac{3}{4}$

C. $\frac{18}{24}$

D. $\frac{5}{6}$

4. A water tank holds $5\frac{1}{2}$ litres of water. If this is written as an improper fraction, what does the numerator represent in terms of $\frac{1}{2}$ litre measures?

A. The number of full litres.

B. The total number of half-litre measures.

C. The remaining fraction of a litre.

D. The product of the whole number and the numerator.

5. A rope is 7 metres long. If $\frac{3}{5}$ of the rope is cut off, what is the length of the remaining piece?

A. $7 - \frac{3}{5}$

B. $7 \times \frac{3}{5}$

C. $7 \times (1 - \frac{3}{5})$

D. $1 - \frac{3}{5}$

6. Karan spent $\frac{1}{4}$ of his monthly allowance on books and $\frac{1}{8}$ on a new pen. What fraction of his allowance did he spend in total?

A. $\frac{2}{12}$

B. $\frac{2}{8}$

C. $\frac{3}{8}$

D. $\frac{1}{32}$

7. A point P is located on a number line exactly midway between $\frac{1}{3}$ and $\frac{2}{3}$. What fraction does point P represent?

A. $\frac{1}{2}$

B. $\frac{3}{6}$

C. $\frac{1}{6}$

D. $\frac{1}{5}$

8. There are 48 students in a class. If $\frac{5}{8}$ of the students are boys, how many girls are there in the class?

A. $48 \times \frac{5}{8}$

B. $48 \times (1 - \frac{5}{8})$

C. $\frac{5}{8}$

D. $48 - \frac{5}{8}$

9. Arrange the following fractions in ascending order (smallest to largest): $\frac{1}{2}, \frac{3}{4}, \frac{1}{3}$

A. $\frac{1}{2}, \frac{1}{3}, \frac{3}{4}$

B. $\frac{3}{4}, \frac{1}{2}, \frac{1}{3}$

C. $\frac{1}{3}, \frac{1}{2}, \frac{3}{4}$

D. $\frac{1}{3}, \frac{3}{4}, \frac{1}{2}$

10. A worker painted $\frac{1}{5}$ of a wall on Monday and $\frac{2}{5}$ of the wall on Tuesday. The rest of the wall was painted on Wednesday. What fraction of the wall was painted on Wednesday?

A. $\frac{3}{5}$

B. $1 + \frac{1}{5} + \frac{2}{5}$

C. $\frac{2}{5}$

D. $1 - \frac{1}{5} - \frac{2}{5}$

SECTION B (2 marks each)

11. Write two equivalent fractions for $\frac{3}{5}$. Show the steps you use to find each one.

12. Compare the fractions $\frac{5}{6}$ and $\frac{7}{9}$ and state which one is greater.

13. Convert the improper fraction $\frac{17}{5}$ into a mixed fraction. Explain the meaning of the whole number part in this context.

14. Rohan walked $\frac{2}{7}$ km in the morning and $\frac{3}{7}$ km in the evening. What is the total distance he walked? Express your answer in the simplest form.

15. There are 40 students in a class. If $\frac{3}{10}$ of the students play chess, how many students play chess?

SECTION C (3 marks each)

16. Maya painted $\frac{1}{3}$ of a wall in the morning and $\frac{2}{5}$ of the same wall in the afternoon. What fraction of the wall is left unpainted?

17. Arrange the following fractions in descending order (largest to smallest): $\frac{2}{3}, \frac{5}{6}, \frac{7}{12}$

18. A water container held $5\frac{3}{4}$ litres of water. After using some water for cleaning, $2\frac{1}{2}$ litres of water remained. How much water was used for cleaning?

SECTION D (4 marks each)

19. 🍕 Case study : Pizza party

Rohan organized a party and ordered two identical pizzas. The first pizza was cut into 8 equal slices. Rohan ate 3 of these slices. The second pizza was cut into 4 equal slices. His friend, Tina, ate 1 of these slices.

1. What fraction of the first pizza did Rohan eat?

2. What fraction of the second pizza did Tina eat?

3. To compare how much they ate, Rohan needs to express Tina's fraction in terms of eighths. Which fraction is equivalent to the amount Tina ate?

4. What is the total fraction of a whole pizza (not of the two combined) that Rohan and Tina ate together? Give the answer in its simplest form.

20. 🍇 Case Study: The Fruit Basket

Rajesh has a large fruit basket at home that contains a total of 20 fruits. The basket has a mix of three types of fruits: Apples, Oranges, and Bananas.

The breakup of the fruits is as follows: Apples: 10 fruits, Oranges: 5 fruits, Bananas: 5 fruits

1. What fraction of the total fruits are Apples? Express your answer in its simplest form.

2. What is the fraction of Bananas in the basket? Express your answer in its simplest form.

3. The fraction of Oranges is $\frac{5}{20}$ and the fraction of Bananas is $\frac{5}{20}$. These two fractions have the same denominator. What type of fractions are $\frac{5}{20}$ and $\frac{5}{20}$?

4. What is the total fraction of Citrus Fruits (Oranges) and Bananas combined? Give the answer in its simplest form.

Worksheet: Fractions

By - RONNY KUMAR SINGH

TGT MATHS

PM SHRI KV NO.1 NAVAL BASE KOCHI

MCQ Questions

1. If 1 roti is divided equally among 4 children, each gets:
a) $\frac{1}{2}$ b) $\frac{1}{4}$ c) $\frac{1}{3}$ d) $\frac{1}{5}$
2. Which fraction is greater: $\frac{1}{5}$ or $\frac{1}{9}$?
a) $\frac{1}{5}$ b) $\frac{1}{9}$ c) Both are equal d) Cannot say
3. The numerator in the fraction $\frac{7}{10}$ is:
a) 7 b) 10 c) 17 d) 70
4. The denominator in the fraction $\frac{4}{7}$ is:
a) 4 b) 7 c) 11 d) 47
5. What is the sum of $\frac{1}{5}$ and $\frac{2}{5}$?
a) $\frac{2}{5}$ b) $\frac{3}{5}$ c) $\frac{1}{10}$ d) $\frac{2}{10}$
6. Which of these is a mixed fraction?
a) $\frac{3}{7}$ b) $\frac{9}{5}$ c) $2\frac{1}{5}$ d) $\frac{2}{3}$
7. Expressing a fraction in lowest terms means:
a) Numerator and denominator have only 1 as common factor
b) Numerator larger than denominator
c) Denominator is always 10
d) Both are even numbers
8. How many fractions lie between 0 and 1?
a) None b) Only two c) Infinitely many d) Only four
9. If 5 glasses of juice are shared among 4 friends, each receives:
a) $\frac{1}{4}$ b) $\frac{5}{4}$ c) $\frac{4}{5}$ d) $\frac{1}{5}$
10. Which is the simplest form of $\frac{16}{20}$?
a) $\frac{8}{10}$ b) $\frac{16}{20}$ c) $\frac{4}{5}$ d) $\frac{1}{5}$

Two-Mark Questions

1. Write the fraction for sharing 3 guavas equally between 3 children.
2. Express $\frac{36}{60}$ in its lowest terms.
3. Convert the improper fraction $\frac{9}{4}$ to a mixed fraction.
4. Compare $\frac{3}{4}$ and $\frac{5}{8}$. Which is greater? Justify your answer.
5. Arrange the fractions $\frac{1}{2}$, $\frac{3}{4}$, $\frac{2}{3}$ in ascending order.

Three-Mark Questions

1. Add the fractions $\frac{2}{5}$ and $\frac{3}{10}$ and express the result in simplest form.
2. Subtract $\frac{3}{8}$ from $\frac{5}{8}$, and show your steps.

3. Solve: If 6 rotis are divided equally among 8 children, how much roti does each child get? Express as a fraction and in decimal.
4. Convert the mixed fraction $2\frac{5}{6}$ to an improper fraction. Show the steps.
5. Find two equivalent fractions for $\frac{3}{7}$.

Case-Based Study Questions

1. Three friends ordered 3 glasses of juice and shared it equally.
 - (a) What fraction of a glass did each friend receive?
 - (b) If one more friend joined, what fraction would each get if shared equally?
 - (c) Discuss how the individual share changes as the number of friends increases.
2. Anil's group divides 2 cakes equally among 5 children.
 - (a) What fraction of a cake does each child get?
 - (b) If another group of 10 children wants to have the same share, how many cakes do they need?
 - (c) Explain using equivalent fractions why both groups receive the same.

Answer Key

MCQ Answers

1. b) $\frac{1}{4}$
2. a) $\frac{1}{5}$
3. a) 7
4. b) 7
5. b) $\frac{3}{5}$
6. c) $2\frac{1}{5}$
7. a) Numerator and denominator have only 1 as common factor
8. c) Infinitely many
9. b) $\frac{5}{4}$
10. c) $\frac{4}{5}$

Two-Mark Answers

1. $\frac{3}{3}=1$ (Each child gets 1 guava)
2. $\frac{36}{60}=\frac{3}{5}$ (Divide numerator and denominator by 12)
3. $\frac{9}{4}=2\frac{1}{4}$ (2 wholes and a remainder of 1)
4. $\frac{3}{4}>\frac{5}{8}$ ($\frac{3}{4}=\frac{6}{8}$, $6>5$)
5. Ascending order $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$

Three-Mark Answers

1. $\frac{2}{5} + \frac{3}{10} = \frac{4}{10} + \frac{3}{10} = \frac{7}{10}$
2. $\frac{5}{8} - \frac{3}{8} = \frac{2}{8} = \frac{1}{4}$
3. $\frac{6}{8} = \frac{3}{4}$; in decimal: 0.75 of a roti per child
4. $2\frac{5}{6} = (2 \times 6) + \frac{5}{6} = \frac{12+5}{6} = \frac{17}{6}$
5. Equivalent fraction: $\frac{3}{7} = \frac{6}{14} = \frac{9}{21}$

Case-Based Study Answers

1. (a) Each friend gets $\frac{3}{3} = 1$ glass
 (b) If shared by 4 friends: $\frac{3}{4}$ of a glass each
 (c) As the number of friends increases, each gets a smaller share (for n friends and 3 glasses, share = $\frac{3}{n}$)
2. (a) Each child gets $\frac{2}{5}$ cake
 (b) For 10 children to have the same share: $10 \times \frac{2}{5} = 4$ cakes.
 (c) $\frac{2}{5}$ (for 5 children) is equivalent to $\frac{4}{10}$ (for 10 children); both receive same share.

CLASS VI

CHAPTER 8

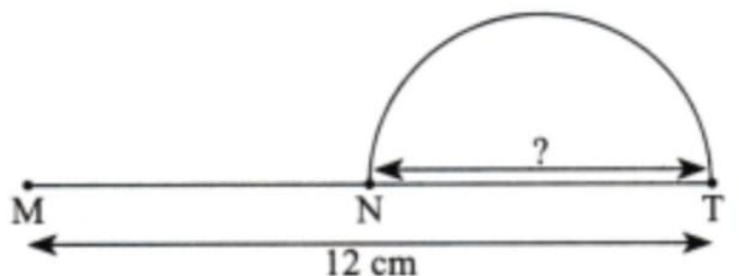
PLAYING WITH CONSTRUCTIONS

SECTION A- MCQ

- Which tool would you use to accurately measure and draw an angle of 75° ?
A) Compass B) Ruler C) Set square D) Protractor
- A teacher asks students to construct a square with a side length of 7 cm. Which of the following is a necessary first step?
A) Draw a diagonal B) Draw a line segment of 7 cm
C) Draw a perpendicular bisector D) Draw a circle with a 7 cm radius
- What is the relationship between the diagonals of a rectangle?
A) They are always parallel B) They bisect each other at 90°
C) They are equal in length D) One is always longer than the other.
- Rahul wants to build a circular park with a diameter of 10 meters. He needs to place a fence around the park and find the exact center to plant a tree. What is the radius of the park?
A) 2 m B) 5m C) 10 m D) 15 m
- A teacher asks you to divide a right angle into two equal parts. What would be the measure of EACH of the resulting angles?
A) 90° B) 45° C) 60° D) 30°
- You are given a line segment AB and told to construct a perpendicular bisector. Which instrument is ESSENTIAL to carry out this construction?
A) A protractor B) A ruler
C) A compass D) A set square
- A rectangle ABCD can also be written as
A) ACDB B) DABC C) CABD D) BDCA
- To draw a line perpendicular to a given line from a point on the line, we use
A) Protractor B) Compass and ruler C) Divider only D) Set square only
- When constructing an angle of 60° , what do we actually do using a compass?
A) Draw two intersecting lines
B) Draw a circle with any radius
C) Make an arc from the vertex and mark the intersection of arcs from both ends
D) Draw equal arcs from a point and join the intersection to the vertex
- If we want to bisect a given angle, how many arcs do we draw using a compass?
A) One B) Two C) Three D) Four

SECTION- B (2 marks)

11. Let AB be a line of length 7cm and M is the midpoint of AB. What is the distance of M from A?
12. A square of side 4cm is rotated. Does the side length of the rotated square change? Explain
13. What is the difference between a perpendicular bisector and an angle bisector?
14. Name the geometrical tools required to construct and measure angles.
15. In the figure given that $NT = \frac{1}{2} MT$. Find the radius of the half circle shown in the figure.



SECTION -C (3 marks)

16. Draw three circles with common centre and radii 3cm, 4cm and 5cm.
17. Draw a rectangle of sides 3cm and 5cm. Verify that the diagonals are equal in length.
18. In the school garden, students are asked to mark a triangular flower bed with all sides equal.
 - (a) What type of triangle will they form?
 - (b) Which construction will help them ensure all sides are equal?
19. A carpenter is fixing a wooden stand and needs to make sure two wooden planks meet at a right angle.
 - (a) Which type of lines should he construct?
 - (b) What instrument can be used to ensure accuracy in this construction?
20. Arun is designing a square photo frame. He has drawn one side of the square on paper and now wants to draw the remaining three sides accurately so that all angles are right angles.
 - (a) What type of construction should Arun perform to make the other sides?
 - (b) Which mathematical concept ensures that all corners of the square are 90° ?

SECTION- D (CASE BASED)

21. Designing the School Garden

The students of Class 6 were given a task by their teacher to design a new school garden. The garden needs to be in a rectangular shape, with walking paths crossing at right angles, flower beds on both sides, and a flagpole exactly in the center.

They used their geometry instruments:

Drew the rectangle using a scale and set square.

Found the center by drawing diagonals.

Constructed perpendicular bisectors for the walking paths.

Checked all angles to make sure they were 90° .

a) To mark the flagpole at the center of the garden, the students drew the diagonals of the rectangle.

Which geometric concept did they use to locate the midpoint

A) Midpoint B) Intersection of diagonals C) Perpendicular lines D) Parallel lines

b) While marking the walking path, the students drew a line perpendicular to one side of the rectangle through its midpoint. Which instrument combination is most suitable for this task?

A) divider B) ruler C) set square D) Compass and ruler

c) To create a triangular flower bed at one corner, they wanted one of its angles to be 60° .

Which instrument is needed to construct a 60° angle?

A) Compass and ruler B) divider C) set square D) ruler

d) If the students mistakenly drew one path making an angle of 85° instead of 90° ,

What geometric concept should they apply to correct this mistake?

A) Construct a perpendicular line using a compass

B) Construct a parallel line.

C) Construct an angle bisector.

D) Construct diagonals.

22. **Building the School Playground**

The students of Class 6 are helping their teacher design a rectangular playground for their school.

First, they draw a line segment $AB = 10$ cm to represent one side of the playground.

Next, they are asked to draw a perpendicular line at A to make the adjacent side of the rectangle.

Then they continue the construction to complete the shape with right angles at each corner.

Finally, they plan to mark the midpoint of each side to place swings and benches equally.

Answer the following MCQs based on the case:

(a) Which mathematical concept is used to draw the second side of the playground at point A?

A) Construction of a perpendicular line to the given line segment.

B) Construction of a parallel line

C) Construction of median.

D) Construction of bisector of a line.

(b) What geometric figure will the students finally form after completing all sides?

A) A rectangle.

B) Rhombus

C) Circle

D) Parallelogram

(c) What construction step helps them find the midpoint of each side to place swings equally?

A) Drawing parallel line B) Drawing angle bisector

C) Drawing median D) Drawing the perpendicular bisector of each side.

(d) If the students want all corners to be exactly 90° , which instruments should they use for accuracy?

A) Ruler

B) Compass

C) A compass and a ruler (or a set square) to ensure right angles.

D) Divider

WORKSHEET		
PLAYING WITH CONSTRUCTIONS	MATHEMATICS	CLASS: 6

	SECTION A	
1.	A circle has: (a) two centers b) a fixed radius(c) at least one centre d) no radii	1
2.	A figure bounded by four sides is called a rectangle if: (a) opposite sides are equal b) opposite angles are equal c) opposite sides are equal and each angle is equal to 90° (d) opposite sides are unequal	1
3.	When drawing a rectangle, which of the following is true about its diagonals? (a)They are always parallel(b)They bisect each other at 90° (c) They are equal in length(d)None of the above	1
4.	If you want to find a point that is equidistant from two given points, which geometrical instrument would you use? (a) Ruler (b) Compass (c) Protractor(d) Set square	1
5.	What is the measure of each angle in a square? (a) 45° (b) 60° (c) 90° d) 120°	1
6.	The radius of a circle is the distance from the _____ to any point on the circle. (a)One point (b) centre (c) Exterior (d) None	1
7.	Let AB be a line of length 7 cm and M is the midpoint of AB. What is the distance of M from A? (a)5cm (b)2.5cm (c) 3.5cm (d) 4cm	1
8.	A square of side 4 cm is rotated. What is the side of the rotated square? (a) 8cm (b) 4cm (c) 2cm (d) 1cm	1
9.	Assertion (A) The diagonals of a rectangle are equal in length. Reason (R) The diagonals of a rectangle bisect each other at right angles. (a) Both A and R are true and R is the correct explanation of A. (b) Both A and R are true but R is not the correct explanation of A. (c) A is true but R is false. (d) A is false but R is true.	1
10	Assertion (A) All squares are rectangles, but not all rectangles are squares. Reason (R) A square has four right angles and all sides equal while a rectangle has only opposite sides equal. (a) Both A and R are true and R is the correct explanation of A (b) Both A and R are true, but R is not the correct explanation of A (c) A is true, but R is false (d) A is false, but R is true	1
	SECTION B	
11	<u>Match the following:</u> <u>A</u> Ruler Compass Set square Protractor <u>B</u> Measuring angle Drawing parallel lines Construct circles Drawing a line	2
12	Draw three circles with common centre and radii 3 cm, 4 cm and 5 cm.	2
13	Draw a 'square with a hole 'taking square of side 5 cm and hole of radius 1.5 cm.	2

14	 (a) What are the possible ways to name the above figure? (b) Measure its sides?	2
15	Construct a square with a side of length 4cm.	2
	SECTION C	
16	Draw a rectangle with sides 4 cm and 6 cm. Find the length of its diagonals.	3
17	Construct a rectangle of sides 3 cm and 9 cm. Construct a square inside, such that the centre of the square is the same as the centre of the rectangle.	3
18	Construct a rectangle one of whose sides is 3 cm and the diagonal is of length 7 cm.	3
19	Construct a rectangle in which one of the diagonals divides the opposite angle into 70° and 20° . How many such rectangles can be drawn?	3
20	Draw a right angle and construct its bisector	3
	CASE STUDY QUESTIONS	
21	 A carpenter needs to cut a piece of wood into two halves. He doesn't have a measuring tape, but he does have a pencil and a compass. He uses a geometrical construction to divide the wood into two equal parts. He starts by drawing a line segment along the length of the wood. Then, he places the compass's point at one end of the line segment and opens the compass to a length greater than half the length of the line segment. He draws arcs from both ends of the line segment, intersecting each other at two points. Finally Q1) What geometrical construction is the carpenter performing? Q2) Draw a line segment and draw its perpendicular bisector? 	
22)	A baker is making a round cake and wants to cut it into 8 equal slices. He uses a geometrical construction to divide the circle into 8 parts. He starts by drawing a diameter of the circle and then constructs perpendicular diameters to divide the circle into equal sections. Q1 Why is the perpendicular diameter significant in this construction? Q2 Draw the construction and divide into 8 equal slices	

ANSWER KEY (CLASS 6 MATHS)
PLAYING WITH CONSTRUCTIONS

	SECTION A	
	Section A consists of 10 questions of 1 mark each	
1.	A fixed radius	1
2.	opposite sides are equal and each angle is equal to 90°	1
3.	They are equal in length	1
4.	Compass	1
5.	90°	1
6.	centre	1
7.	3.5cm	1
8.	4cm	1
9.	A is true but R is false.	1
10.	Both A and R are true, but R is not the correct explanation of A	1
	SECTION B	
11	Ruler Compass Set square Protractor Drawing a line drawing circles drawing parallel lines measuring angles	1+1
12.	Draw circles as per given measures	1+1
13.	(a) Draw square of side 5cm (b) find the centre and draw the circle of radius 1.5cm	1+1
14.	ABCD and ADCB / measure the sides	1 each
15	Construction of a square by constructing 90° on both ends of the line segments , marking the lengths on 4 sides correctly	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$
	SECTION C	
16	Correct construction as per the directions	2 1
17	Correct construction as per the directions	1 1 1
18.	Correct construction as per the directions	$1\frac{1}{2}$ $1\frac{1}{2}$
19	Draw a line segment and locate third point by taking one of the angles Locating 4 th vertex by drawing perpendicular Final construction	$1\frac{1}{2} +$ $1\frac{1}{2}$
20	Correct construction as per the directions	
21	(a) Bisecting a line segment or finding the midpoint of a line segment (b) draw as per direction	4
22	When we draw the two diameters, it ensures the circle is divided into 4 equal parts. Then draw the bisectors of each angle, we get the 8 equal slices.	4

Worksheet: Playing with Constructions class:VI

Section A: Concept Understanding

- 1) All the points that are at the same distance from a fixed point form a:
a) Line b) Triangle c) Circle d) Square
- 2) A square satisfies which of the following properties?
a) All sides equal and all angles 60°
b) Opposite sides equal and all angles 90°
c) All sides equal and all angles 90°
d) Opposite sides parallel but not equal
- 3) When a square is rotated, which of the following remains the same?
a) Only sides b) Only angles
c) Both sides and angles d) Neither sides nor angles
- 4) To draw a circle of radius 4 cm, what should you do first?
a) Draw a 4 cm line segment
b) Keep compass opening 4 cm and fix its tip at a point
c) Draw perpendicular lines
d) Use a ruler to draw arcs
- 5) In a rectangle, the opposite sides are:
a) Unequal and parallel b) Equal and not parallel
c) Equal and parallel d) None of these
- 6) When drawing a rectangle, which of the following is true about its diagonals?
(a) They are always parallel.
(b) They bisect each other at right angles.
(c) They are equal in length.
(d) They form acute angles with each other.
- 7) If you want to find a point that is equidistant from two given points, which geometrical instrument would you primarily use?
(a) Ruler (b) Compass (c) Protractor (d) Set square
- 8) A student constructs a rectangle of sides 4 cm and 6 cm. What should be the measure of each angle?
a) 45° b) 60° c) 90° d) 120°
- 9) When constructing a rectangle using a given side and a diagonal, the compass is

used to:

- a) Draw perpendicular lines
- b) Locate the fourth vertex by drawing an arc
- c) Measure sides only
- d) Draw diagonals first

10) If all sides of a quadrilateral are 5 cm but the angles are not 90° , the figure formed is:

- a) Square
- b) Rectangle
- c) Rhombus
- d) Parallelogram

Section B(2 marks)

11) Construct a rectangle in which one diagonal divides the opposite angle

into 60° and 30° . What geometric reasoning helps you determine the fourth vertex?

12) Construct a square of side 6 cm. Which steps ensure that all sides and angles are equal?

13) Draw a line segment of length 8.6 cm. Bisect it and measure the length of each part.

14) Draw a circle with centre at point O and radius 5 cm. Draw its chord AB, and draw the perpendicular bisector of line segment AB. Does it pass through the centre of the circle?

15) Draw a circle with radius 3.5 cm

Section C (3 Marks each)

16). Construct a rectangle whose one side measures 5 cm and the diagonal measures 7 cm. *Explain each step of the construction and verify whether the figure satisfies the properties of a rectangle.*

17). Construct a rectangle in which one of the diagonals divides the opposite angles into 45° and 45° . *What do you observe about the sides of the rectangle? State your observation and reasoning.*

18). Draw a square of side 6 cm using a compass and ruler only. *Explain why each angle is 90° and all sides are equal without using a protractor.*

19). Construct a rectangle that can be divided into three identical squares. *Write the relationship between the length and breadth of the rectangle and justify your steps.*

20). Using a compass, locate a point that is equidistant from two given points A and B. *Explain how you can verify the correctness of your construction.*

Section D: Case Study / Application-Based Question

21) The Designer's Blueprint

A graphic designer is creating a logo that uses simple geometric shapes. The core element of the logo is a figure constructed using only a ruler and a compass. The steps for the construction are as follows:

- (i) Draw a line segment XY
- (ii) With X as the center and a radius of more than half the length of XY , draw an arc above and an arc below XY .
- (iii) With Y as the center and the same radius, draw arcs that intersect the previous arcs at points A and B .
- (iv) Draw a line segment connecting points A and B . This line intersects XY at point M .

Questions based on the case study:

1. What is the final figure (line segment AB) constructed in this process called?
 - (a) Angle bisector
 - (b) Line segment
 - (c) Perpendicular bisector
 - (d) Diagonal
2. What is the measure of the angle formed at the intersection point M ?
 - (a) 45°
 - (b) 60°
 - (c) 90°
 - (d) 180°
3. What is the relationship between the lengths of segments XM and MY ?
 - (a) $XM > MY$
 - (b) $XM < MY$
 - (c) $XM = MY$
 - (d) Cannot be determined

22) Exploring Diagonals of Rectangles and Squares

Students construct a **rectangle PQRS** and join its diagonals **PR and QS**. They notice that the diagonals intersect each other.

Answer the following:

1. What do you observe about the lengths of the diagonals in a rectangle?
2. What happens when the rectangle becomes a square?
3. What property do you observe about the angles formed at the intersection point?

	PLAYING WITH CONSTRUCTION	
	SECTION-A(MCQ)	
1	A circle can be drawn if we know its a) centre (b)plane (c)angles (d) radius	1
2	A circle can be drawn with a) ruler only (b)compass only (c)protractor only (d)divider	1
3	To draw an angle of 90^0 , we can use (a) Protractor (b) compass (c) divider (d) ruler	1
4	A line segment hasend points (a) 0 (b) 1 (c) 2 (d) many	1
5	To draw perpendicular bisector of a line segment, we use (a)compass (b)protractor & ruler (c)divider (d)compass & ruler	1
6	The point where two lines meet is called (a)ray (b) vertex (c)intersection point (d) mid point	1
7	Which tool is used to measure angles (a)compass (b)protractor (c)ruler (d)divider	1
8	The fixed distance from the centre of a circle to any point on the circle is called the (a)diameter (b)radius (c)circumference (d)area	1
9	A rectangle can be constructed if we know the its (a)sides (b)angles (c)two diagonals (d)perimeter	1
10	A quadrilateral with all sides equal is (a)rectangle (b)square (c)trapezium (d)parallelogram	1
	SECTION-B(2 marks)	
11	Write two properties of a square.	2
12	Make a circle of radius 3cm	2
13	What are the instruments found in the geometry box, write its uses.	2
14	Define radius ,diameter and chord of a circle.	2
15	Construct an 90^0 angle using compass	2
	SECTION-C(3 marks)	

16	Draw a rectangle with sides of length 4cm and 6cm. Check if it satisfies the property of rectangles.	3
17	Construct a square of sides 5cm and measure its diagonals.	3
18	Construct a rectangle in which one of its diagonal divides the opposite angles into 60° and 30° .	3
19	Construct a rectangle where one of its sides is 5cm and the length of a diagonal is 7cm.	3
20	Is there a 4 sided figure in which all sides are equal in length but is not a square? If so can you construct it.	3
	SECTION-D(4 marks) CASE STUDY BASED QUESTION	
21	Ravi was asked to make a flower pattern using circles. He placed the compass at a point O and drew a circle of radius 3cm. Then without changing the radius, he placed the compass at a point A on the circle and drew another circle. Similarly he takes point B, C, D, E and F on the circle and draw circles of same radius to get a pattern. (i) What is the diameter of the circles drawn? (ii) How many circles he has drawn to complete the pattern? (iii) What geometrical shape will join all the centres of these circles?	4
22	Neha is making a small paper kite. She drew a diagonal AB =8cm and wanted to fold the paper along a perpendicular through the midpoint of AB. (i) What is the purpose of drawing perpendicular bisector in this activity? (ii) Which instruments is used for drawing the perpendicular bisector? (iii) Write the steps to draw a perpendicular bisector? *****.....	4

	ANSWERS 1.Radius 2.compass 3.protractor 4.2 5.compass & ruler 6.intersection point 7.protractor 8.radius 9. sides 10.square	

Chapter 9

Symmetry

Grade 6 Math Question Bank

Made By: Akash Tanwar, TGT Math, PM Shri KV Pattom Shift 2

Multiple Choice Questions (1 Mark each)

1. A line that divides a figure into two identical halves is called—

- a) Parallel line
- b) Perpendicular line
- c) Line of symmetry
- d) Transversal

Answer: c

2. How many lines of symmetry does a square have?

- a) 2
- b) 3
- c) 4
- d) 5

Answer: c

3. A figure that looks the same after rotation has—

- a) Reflection symmetry
- b) Translational symmetry
- c) Rotational symmetry
- d) No symmetry

Answer: c

4. What is the smallest angle of rotational symmetry of a square?

- a) 45°
- b) 90°
- c) 120°

d) 360°

Answer: b

5. The number of lines of symmetry in an equilateral triangle is—

a) 1

b) 2

c) 3

d) 4

Answer: c

6. A circle has—

a) Only one angle of symmetry

b) Only one line of symmetry

c) Infinite lines and angles of symmetry

d) No symmetry

Answer: c

7. The butterfly shown in the chapter has—

a) No symmetry

b) One line of symmetry

c) Two lines of symmetry

d) Four lines of symmetry

Answer: b

8. A rectangle (not a square) has how many lines of symmetry?

a) 1

b) 2

c) 3

d) 4

Answer: b

9. The order of rotational symmetry of a regular hexagon is—

a) 2

b) 3

- c) 4
- d) 6

Answer: d

10. If the smallest angle of rotational symmetry is 60° , the order of symmetry is—

- a) 2
- b) 3
- c) 4
- d) 6

Answer: d

Short Answer Type Questions (2 Marks Each)

1. Define line of symmetry. Give one example.
2. How many lines of symmetry does a regular hexagon have? Draw or explain.
3. Explain rotational symmetry with an example.
4. Can a figure have reflection symmetry but no rotational symmetry? Give example.
5. The smallest angle of rotational symmetry of a figure is 45° . What are all its angles of symmetry?
6. A figure has 3 angles of symmetry less than 360° . What could be its smallest angle of symmetry?

Long Answer Type Questions (3 Marks Each)

1. Draw a square. Show and explain all four lines of symmetry and all angles of rotational symmetry of the square. Also write its order of rotational symmetry.
2. Explain the difference between reflection symmetry and rotational symmetry with suitable diagrams and examples from the chapter (butterfly, rangoli, windmill).

3. A figure has radial arms.

a) Draw a figure having 5 angles of rotational symmetry.

b) Mention all angles of symmetry.

c) What will be the smallest angle of symmetry for 7 radial arms?

d) State whether it is a whole number or not.

Explain with steps.

Competency Based Questions (4 Marks Each)

1. A rangoli is drawn using repeating petals around a centre. The rangoli looks the same when rotated by 60° , 120° , 180° , 240° , 300° , and 360° .

Sub-questions

1. What is the order of rotational symmetry of the rangoli?

a) 3

b) 4

c) 5

d) 6

Answer: d (1 mark)

2. What is the smallest angle of rotational symmetry?

a) 30°

b) 45°

c) 60°

d) 90°

Answer: c (1 mark)

3. The rangoli can have how many lines of symmetry?

a) 3

b) 4

c) 6

d) 8

Answer: c (2 marks)

2. The outer boundary of the New Parliament building is a regular 3-sided symmetrical design. It has 3 lines of reflection symmetry.

Sub-questions

1. What type of polygon does the outer boundary resemble?

- a) Square
- b) Pentagon
- c) Triangle
- d) Hexagon

Answer: c (1 mark)

2. What is its smallest angle of rotational symmetry?

- a) 60°
- b) 90°
- c) 120°
- d) 180°

Answer: c (1 mark)

3. What is the order of its rotational symmetry?

- a) 2
- b) 3
- c) 4
- d) 6

Answer: b (2 marks)

Competency Based Worksheet

Topic- Symmetry

Class - 6

Mange Ram

KV CRPF PERINGOME

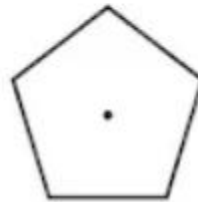
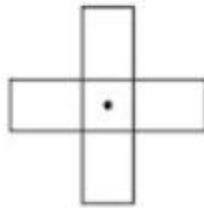
MCQ -10

1. A line that divides a figure into two identical parts is called:
a) Radius b) Diameter c) Line of Symmetry d) Axis of Rotation
2. A square has how many lines of symmetry?
a) 1 b) 2 c) 3 d) 4
3. A circle has how many lines of symmetry?
a) 0 b) 2 c) 4 d) Infinite
4. Which of the following has exactly one line of symmetry?
a) Scalene triangle b) Isosceles triangle c) Square d) Circle
5. Which of the following shapes has no line of symmetry?
a) Rectangle b) Square c) Scalene triangle d) Circle
6. Rotational symmetry depends on:
a) Folding b) Reflection c) Rotation around a point d) None
7. A figure that does not change its shape even after rotation has:
a) No symmetry b) Line symmetry c) Rotational symmetry d) Reflection only
8. The smallest angle of rotational symmetry of a square is:
a) 30° b) 60° c) 90° d) 180°
9. Which has both reflection and rotational symmetry?
a) Square b) Rectangle c) Trapezium d) Rhombus
10. A figure folded and both parts overlap perfectly. This shows:
a) Rotation b) Reflection symmetry c) No symmetry d) None

2 Marks Questions -5

1. Draw two figures other than a circle and a square that have both reflection symmetry and rotational symmetry.

2. Give the order of rotational symmetry for each figure:



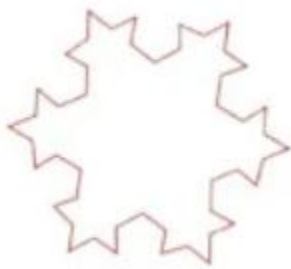
3. Can we have a figure with rotational symmetry whose smallest angle of symmetry is
(a) 45° (b) 17°

4. Draw the following:

- a. A triangle with exactly one line of symmetry
- b. A triangle with exactly three lines of symmetry
- c. A triangle with no line of symmetry

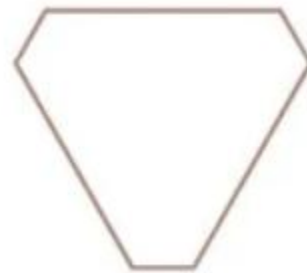
Is it possible to draw a triangle with exactly two lines of symmetry?

5. Figures can have multiple lines of symmetry. The figures below also have multiple lines of symmetry. Can you find them all?



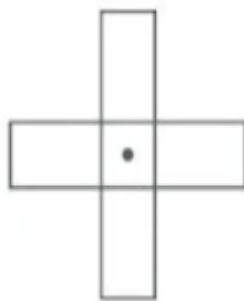
3 Marks Questions -5

1. This is a picture of the new Parliament Building in Delhi.



- a. Does the outer boundary of the picture have reflection symmetry? If so, draw the lines of symmetries. How many are they?
- b. Does it have rotational symmetry around its centre? If so, find the angles of rotational symmetry.

2. Find the angles of symmetry for the given figures about the point marked.



(a)

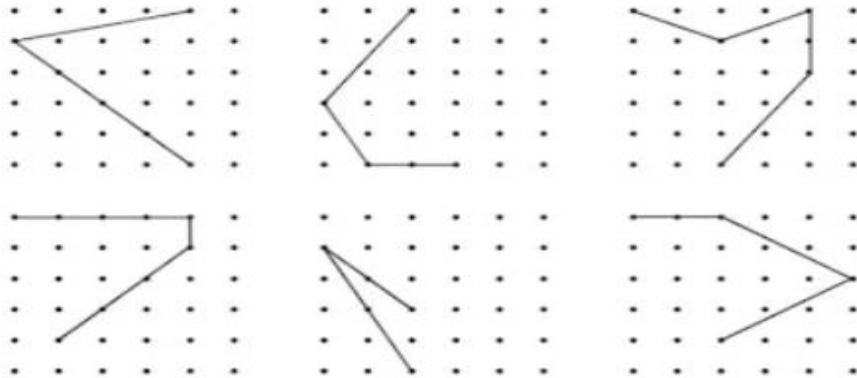


(b)



(c)

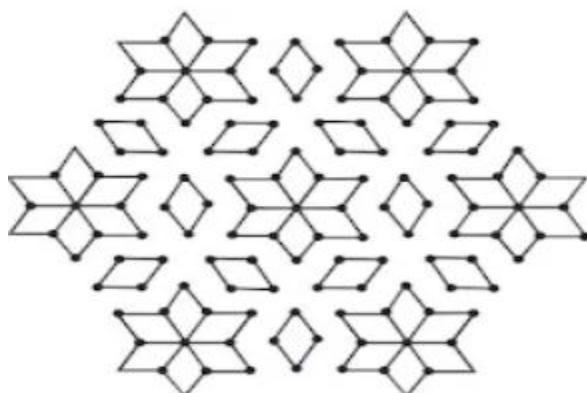
3. Copy the following on a dot grid. For each figure draw two more lines to make a shape that has a line of symmetry.



4. How many lines of symmetry and angles of symmetry does Ashoka Chakra have?

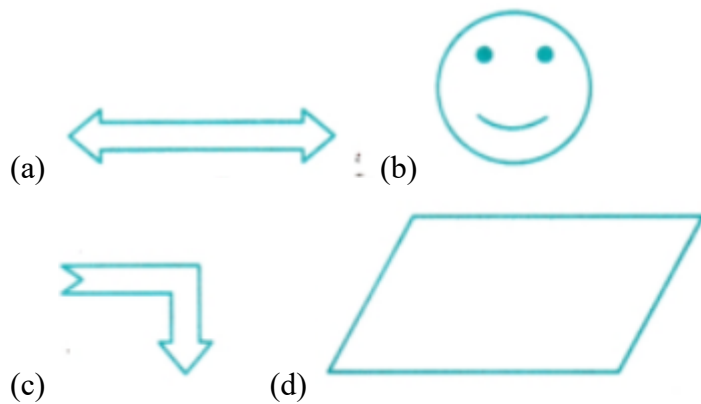


5. Find the lines of symmetry for the Kolam below.



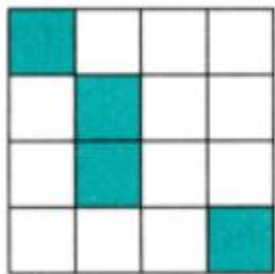
Case Study -2

1. In the following figures, identify the figure that has:



- (i) line of symmetry
- (ii) rotational symmetry
- (iii) both line of symmetry and rotational symmetry
- (iv) neither line of symmetry nor rotational symmetry

2. Minimum, how many unit squares will you colour so that the figure has:



- (i) only one line of symmetry?
- (ii) two lines of symmetry?
- (iii) four lines of symmetry?
- (iv) only a horizontal line of symmetry?

ANSWERS

MCQ ANSWERS:

- 1) c) Line of Symmetry
- 2) d) 4
- 3) d) Infinite
- 4) b) Isosceles Triangle
- 5) c) Scalene Triangle
- 6) c) Rotation around a point
- 7) c) Rotational Symmetry
- 8) c) 90°
- 9) a) Square
- 10) b) Reflection Symmetry

2 MARKS ANSWERS:

1) Rectangle and Rhombus have both reflection symmetry and rotational symmetry. Rectangle has 2 lines of symmetry and rotational symmetry order 2. Rhombus also has 2 lines of symmetry and rotational symmetry order 2.

2) Order of rotational symmetry:

Square = 4

Rectangle = 2

Equilateral Triangle = 3

3) Smallest angle for rotational symmetry:

$45^\circ \rightarrow$ Possible because $360 \div 45 = 8$

$17^\circ \rightarrow$ Not possible because $360 \div 17$ is not a whole number.

4) Triangles:

Isosceles Triangle $\rightarrow$ 1 line of symmetry

Equilateral Triangle $\rightarrow$ 3 lines of symmetry

Scalene Triangle $\rightarrow$ 0 lines of symmetry

No triangle can have 2 lines of symmetry.

5) Square has 4 lines of symmetry. Circle has infinite lines of symmetry.

3 MARKS ANSWERS:

1) New Parliament Building has 6 lines of reflection symmetry and rotational symmetry angle 60° ($360 \div 6$).

2) Angle of rotational symmetry = $360^\circ / n$ (where n is number of times it matches in rotation).

3) In dot grid figure, shapes must be drawn so that left matches right and top matches bottom for symmetry.

4) Ashoka Chakra has 24 spokes:

Lines of symmetry = 24

Angle of rotational symmetry = $360 \div 24 = 15^\circ$

5) Kolam design has 4 lines of symmetry and rotational symmetry order 4.

CASE STUDY:

Question 1.

(i) Only line symmetry: Isosceles Triangle, Rectangle

(ii) Only rotational symmetry: Parallelogram

(iii) Both symmetry: Square, Rhombus

(iv) Neither: Scalene Triangle

Question 2.

Instructions for filling the grid:

(a) One Line of Symmetry:

Fill the grid so that the shape matches itself across only one mirror line (either Left–Right or Top–Bottom).

(b) Two Lines of Symmetry:

Fill the grid so that the shape matches in both directions: Left–Right and Top–Bottom.

(c) Four Lines of Symmetry:

Fill the grid in a balanced pattern so that the shape matches in all directions, similar to a square design.

(d) Only Horizontal Line of Symmetry:

Fill the grid so that the top and bottom halves are identical, but the left and right halves are different.

PM SHRI KENDRIYA VIDYALAYA MALAPPURAM

TEACHER NAME: RAJEEV RANJAN (TGT MATHS)

WORKSHEET- THE OTHER SIDE OF ZERO

CLASS- VI

SUBJECT: MATHS

General Instructions:

1. This Paper contains 4 Sections A, B, C and D.
2. Section A has 10 MCQs, carrying 1 mark each.
3. Section B has 5 questions carrying 2 marks each.
4. Section C has 5 questions carrying 3 marks each.
5. Section D has 2 questions.
6. Draw neat figures wherever required.

Q	SECTION(A)	M
1.	What is the number on the other side of zero that is the same distance as +5? (a) +5 (b) -5 (c) 0 (d) None	1
2.	Which of the following lies to the left of zero on the number line? (a) +4 (b) +2 (c) 0 (d) -2	1
3.	The opposite of -7 is: (a) +7 (b) -7 (c) 0 (d) None	1
4.	Which integer is greater? (a) -8 (b) -15 (c) -3 (d) -15	1
5.	Arrange in ascending order: -2, +5, 0, -6 (a) -6, -2, 0, +5 (b) +5, 0, -2, -6 (c) 0, -2, +5, -6 (d) -6, +5, -2, 0	1
6.	The value of $(-9) + (-5)$ is: (a) -14 (b) +14 (c) -4 (d) +4	1
7.	If we move 3 steps to the left from -2 on a number line, we reach: (a) +1 (b) -1 (c) +2 (d) None	1
8.	Fill in the blank: -8 ____ -5 (a) > (b) < (c) = (d) ≠	1

9	Which of the following statements is true? (a) -7 is greater than -3 (b) -3 is greater than -7 (c) $+7$ is less than -3 (d) 0 is less than -2	1									
10.	On a number line, moving right means the numbers: (a) increase (b) decrease (c) remains same (d) turn negative	1									
	SECTION(B)										
11.	The depth of a submarine is 350m below sea level. If it rises 120m. What is its new position?	2									
12.	The temperature at 6 a.m. was -3°C . By noon, it rose by 7°C . Find the temperature at noon.	2									
13.	Write all integers between -4 and $+3$.	2									
14.	Is 2 greater than -3 ? Why?	2									
15.	Give two pair of numbers whose sum is -8 .	2									
	SECTION(C)										
16.	Represent the following numbers on the number line: -4 , 0 , $+3$.	3									
17.	Find the value of the following: (a) $(-2) + (-9) + 5$ (b) $10 - (-3) + (-6)$	3									
18.	The height of a hill is taken as $+900$ m, and the depth of a mine is -300 m. Find the difference in their levels.	3									
19.	The temperature of Kashmir at 6 a.m. was -5°C . By noon, it rose by 10°C , and by evening it dropped by 7°C . What was the temperature at evening?	3									
20.	Complete the grid to make the required border sum is 0 . <table border="1" data-bbox="1083 1350 1353 1574"> <tr> <td>4</td><td>-1</td><td>-3</td></tr> <tr> <td>-3</td><td></td><td>1</td></tr> <tr> <td>-1</td><td>-1</td><td>2</td></tr> </table>	4	-1	-3	-3		1	-1	-1	2	3
4	-1	-3									
-3		1									
-1	-1	2									
	SECTION(D)										
21.	There was a class activity. In this activity students measure the height of geographical features like mountains, plateaus and deserts from the sea level. The height at sea level is 0m. Heights above sea level are represented using positive numbers and heights below sea level are represented using negative numbers. Can you solve the following questions. (a) Looking at the geographical cross section, write the height of A, B, C and D. (b) Which is the highest point in this geographical cross-section?										

	(c) Which is the lowest point in this geographical cross-section? (d) Can you write the points A, B, C, ..., G in a sequence of ascending order of heights?	
22.	Ramesh had ₹500 in his account. He withdraws ₹200, then deposits ₹150, and finally withdraws ₹400. (a) Write all transactions as integers. (b) Write all these transactions in ascending order. (c) Find Ramesh's final account balance. (d) If the balance is negative, what does it indicate?	

ANSWERS

SECTION (A) — MCQs

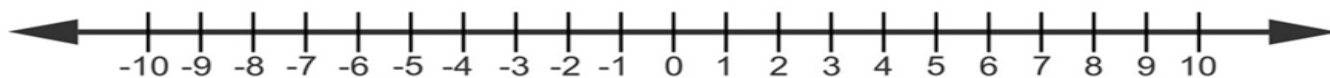
1. (b) -5
2. (d) -2
3. (a) +7
4. (c) -3
5. (a) -6, -2, 0, +5
6. (a) -14
7. (d) None, -5
8. (b) <
9. (b) -3 is greater than -7
10. (a) increase

SECTION (B)

11. $-350 + 120 = -230$ m. Therefore, submarine is **230 m below sea level**.
12. $-3 + 7 = +4^{\circ}\text{C}$. Therefore, the temperature at noon = **$+4^{\circ}\text{C}$**
13. -3, -2, -1, 0, +1, +2
14. In a number line, 2 lies right to -3. Therefore, 2 is greater than -3.
15. $(-4) + (-4) = -8$ and $(-9) + (+1) = -8$

SECTION (C)

- 16.



17. **(a)** $(-2) + (-9) + 5 = -11 + 5 = -6$, **(b)** $10 - (-3) + (-6) = 10 + 3 - 6 = 7$

18. Height = +900 m, Depth = -300 m, Difference = $(+900) - (-300) = 900 + 300 = 1200$ m

19. At 6 a.m. = -5°C , rises by $10^{\circ}\text{C} \rightarrow -5 + 10 = +5^{\circ}\text{C}$, Drops by $7^{\circ}\text{C} \rightarrow 5 - 7 = -2^{\circ}\text{C}$

20. Top row: $4 + (-1) + (-3) = 0$,

Bottom row: $(-1) + (-1) + 2 = 0$

Left column: $4 + (-3) + (-1) = 0$

Right column: $(-3) + 1 + 2 = 0$

SECTION (D) — Case Studies

21. (a) A=1500m, B= -500m, C= 250m, D= -1250m.

(b) 1500m

(c) -1250m

(d) -1250m, -500m, -200m, 100m, 250m, 1250m, 1500m.

22. (a) +500, -200, +150, -400.

(b) -400, -200, +150, +500.

(c) ₹50.

(d) It indicates that Ramesh withdrew more money from Bank.