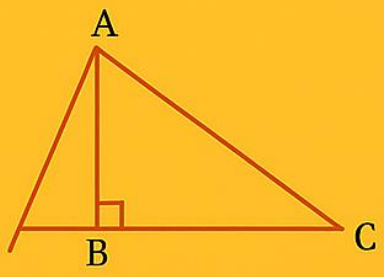
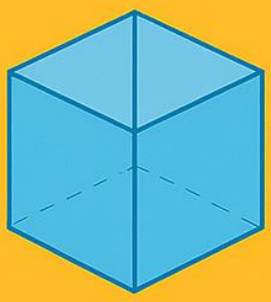


सेवार्थेम विद्यात्सा खात्न

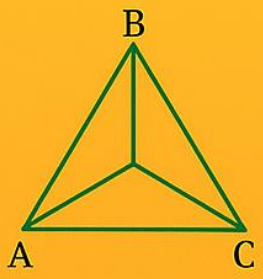
$$a(b+c) = ab+ac$$



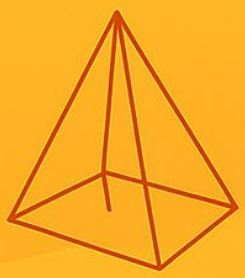
$$a^2 + 2ab + \frac{a}{2} = b^2$$

Surface Area = ba^2

Ganit Prakash



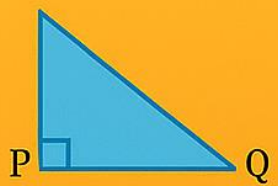
WORKSHEET



CLASS 7

$(a^2 + 2ab + b^2$

$$\frac{ax+b}{2} = x$$



$S_n = n/2a + (n-1)d$

KVS RO GUWAHATI REGION

$4x-1$

केंद्रीय बिद्यालय संगठन

KENDRIYA VIDYALAYA SANGATHAN $-ax+b$

$-x+b$

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INDEX

CHAPTER 1 LARGE NUMBERS AROUND US

MCQs

1. The number 1,00,000 is read as:
   (a) One hundred thousand
   (b) One lakh
   (c) One million
   (d) Ten thousand
   Answer: (b)

2. The largest 4-digit number is:
   (a) 1000
   (b) 9999
   (c) 999
   (d) 10000
   Answer: (b)

3. In the Indian system, commas are placed in the pattern:
   (a) 3-3-3
   (b) 2-2-3
   (c) 3-2-2
   (d) 3-2-1
   Answer: (c)

4. 1 crore =
   (a) 1,00,000
   (b) 10,00,000
   (c) 1,00,00,000
   (d) 10,00,00,000
   Answer: (c)

5. Which button does the Thoughtful Thousands calculator have?
   (a) +10
   (b) +100
   (c) +1000
   (d) +10000
   Answer: (c)

6. Which of the following numbers is Seventy five thousand?
   (a) 70,000
   (b) 75,000
   (c) 80,000
   (d) 1,00,000
   Answer: (b)

7. Multiplying by 5 is the same as:
   (a) ×10
   (b) ÷2 then ×10
   (c) ×2 ÷10
   (d) ÷10
   Answer: (b)

8. The American system uses comma placement in:
   (a) 3-3-3 pattern
   (b) 3-2-2 pattern
   (c) 2-2-3 pattern
   (d) No commas
   Answer: (a)

9. 1 million equals:
   (a) 1 lakh
   (b) 10 lakhs
   (c) 1 crore
   (d) 100 lakhs
   Answer: (b)

10. The Statue of Unity is approximately:
    (a) 100 m
    (b) 180 m
    (c) 450 m

(d) 600 m
Answer: (b)

11. The nearest lakh to 6,72,85,183 is:
    (a) 6,70,00,000
    (b) 6,72,00,000
    (c) 6,73,00,000
    (d) 7,00,00,000
    Answer: (c)

12. 6400 × 62,500 Litre gives the number of:
    (a) km between Earth and Sun
    (b) varieties of rice
    (c) litres of water discharged by Amazon river per second
    (d) seats in a stadium
    Answer: (c)

13. If a bus carries 50 people, then 1 lakh buses can carry:
    (a) 5 crore
    (b) 50 lakh
    (c) 10 lakh
    (d) 100 lakh
    Answer: (b)

14. 1 Arab is 1 followed by ____ zeroes.
    (a) 5
    (b) 8
    (c) 9
    (d) 8
    Answer: (c)

VSA (2 MARKS)

1. Write 3,00,600 in words in the Indian system.
2. How much less than 1 lakh is 75,000?
3. Write the number name of 15,75,000.
4. How many thousands make one lakh?
5. Compare using <, > or = :
   30 thousand ___ 3 lakhs
6. Round 76,068 to the nearest thousand.
7. Write One lakh twenty-three thousand four hundred fifty-six in numerals.
8. Find the nearest crore to 6,72,85,183.
9. Evaluate using a shortcut:
   2 × 1768 × 50
10. Write 1 crore in the American system.

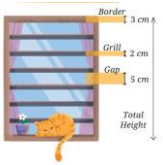
SA (3 MARKS)

1. According to the 2011 Census, the population of the town of Chintamani was about 75,000. How much less than one lakh is 75,000?.
2. Convert the following to Indian place-value notation:
   48121620
3. The estimated population of Chintamani in the year 2024 is 1,06,000. How much more than one lakh is 1,06,000?

4. Round 29,05,32,481 to the nearest:
   (a) thousand
   (b) lakh
   (c) crore
5. Multiply quickly: 72 × 125
6. Using estimation, decide whether 4,63,128 + 4,19,682 is closer to 8 lakh or 9 lakh.
7. How many zeros does 1 thousand lakh have?
8. Write the number 4050678 in words in both Indian and American systems.
9. 14,63,128 – 4,90,020
10. Roxie: “The difference is near 10,00,000 and is less than 10,00,000.”
11. Estu: “The difference is near 9,00,000 and is more than 9,00,000.”
12. (a) Are these estimates correct? Whose estimate is closer to the difference? (b) Will the difference be greater than 9,50,000 or less than 9,50,000?
13. Calculate these products quickly.
14. (a) 25 × 12 = _____ (b) 25 × 240 = _____ (c) 250 × 120 = _____
    (d) 2500 × 12 =_____
15. (e) _____×_____= 120000000
16. 5 marks questions
17. If Roxie travels 100 km every day for 10 years:
    (a) How many km will she cover?
    (b) Is it enough to reach the Moon (3,84,400 km)?
    (c) How many more km would be needed?
    Show calculations.
18. The Tedious Tens only has a +10 button. How many times should it be pressed to show:
19. (a) Five hundred? _____ (b) 1000? _____ (c) 3700? _____ (d) One lakh? _____
20. (e) _____? 435 times
    Amazon river discharge: 6400 × 62,500 litres per second.
    (a) Compute the value.
    (b) Write it in Indian and American systems.
    (c) Estimate how much water it would discharge in 10 seconds.
    (d) Is it more or less than 4 crore litres?

CHAPTER 2

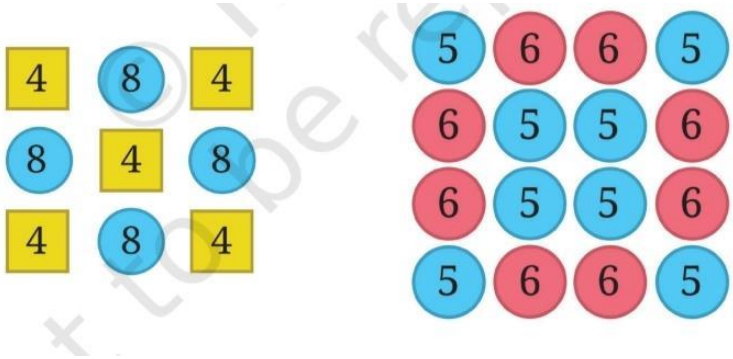
CHAPTER : ARITHMETIC EXPRESSION		
1	Fill in the blanks to make the expressions equal on both sides of the = sign: 13 + 4 = ___ + 7	1
2	(– 11) × 7 is not equal to (a) 11 × (– 7) (b) – (11 × 7) (c) (– 11) × (– 7) (d) 7 × (– 11)	1
3	(– 10) × (– 5) + (– 7) is equal to (a) – 57 (b) 57 (c) – 43 (d) 43	1
4	– 43) × (– 99) + 43 is equal to (a) 4300 (b) – 4300 (c) 4257 (d) – 4214	1
5	What is the value of: 75 – 5 × (6 + 4)? (a) 25 (b) 35 (c) 20 (d) 30	1
6	Madhu is flying a drone from a terrace. The drone goes 6 m up and then 4 m down. Write an expression to show how high the final position of the drone is from the terrace.	2
7	Are there other ways of getting 14? Fill them out below: (a) ____× (____+____) = 14 (b) ____× (____+____) = 14	2

	(c) ____× (____+____) = 14 (d) ____× (____+____) = 1	
8	Find the values of expressions by writing the terms. (a) 38 - 9+ 18 (b) 7 + 9 -12	2
9	Find the total height of the window. by writing an expression describing the relationship among the measurements shown in the picture. 	2
10	Add brackets at appropriate places in the expressions such that they lead to the values indicated. (a) 34 – 9 + 12 = 13 (b) 56 – 14 – 8 = 34	2
11	Which is greater? 113 – 25 or 112 – 24?	2
12	Identify which of the following expressions are equal to the given expression without computation. (a) 83 – 37 – 12 (i) 84 – 38 – 12 (ii) 84 – (37 + 12) (iii) 83 – 38 – 13 (iv) – 37 + 83 –12 (b) 93 + 37 × 44 + 76 (i) 37 + 93 × 44 + 76	2

	(ii) 93 + 37 × 76 + 44 (iii) (93 + 37) × (44 + 76) (iv) 37 × 44 + 93 + 76	
13	Write a pair of integers whose sum is zero (0) but difference is 10.	2
14	Match the integer in Column I to an integer in Column II so that the sum is between –11 and – 4 Column I. Column II (a) –6. (i) –11 (b) +1 (ii) –5 (c) +7 (iii) +1 (d) –2 (iv) –13	2
15	In the Republic Day parade, there are boy scouts and girl guides marching together. The scouts march in 4 rows with 5 scouts in each row. The guides march in 3 rows with 5 guides in each row (see the figure below). How many scouts and guides are marching in this parade?	3
16	Choose a number and create ten different expressions having that value.	3
17	Find different ways of evaluating the following expressions: (a) 1 – 2 + 3 – 4 + 5 – 6 + 7 – 8 + 9 – 10 (b) 1 – 1 + 1 – 1 + 1 – 1 + 1 – 1 + 1 – 1	3
18	Fill in the blanks with numbers, and boxes by signs, so that the expressions on both sides are equal.	3

<table>
<tr><td></td><td>(a) 3 × (5 + 8) = 3 × 5 3 × ___
(b) (9 + 2) × 4 = 9 × 4 2 ×___
(c) 3 × (___ + 4) = 3 ___+___
(d) (___+ 6) × 4 = 13 × 4 + ___
(e) 3 × (___+___) = 3 × 5 + 3 × 2
(f) (___+___)×___= 2 × 4 + 3 × 4</td><td></td></tr>
<tr><td>19</td><td>Binu earns ₹20,000 per month. She spends ₹5,000 on rent, ₹5,000 on food, and ₹2,000 on other expenses every month. What is the amount Binu will save by the end of a year?</td><td>3</td></tr>
<tr><td>20</td><td>Compare the following pairs of expressions using ‘<’, ‘>’ or ‘=’ or by reasoning.
(a) 49 – 7 + 8 _____49 – 7 + 8
(b) 83 × 42 – 18_____ 83 × 40 – 18
(c) 145 – 17 × 8_____ 145 – 17 × 6
(d) 23 × 48 – 35_____ 23 × (48 – 35)
(e) (16 – 11) × 12____ –11 × 12 + 16 × 12</td><td>3</td></tr>
<tr><td>21</td><td>Complete the table.
<table><tr><th>Expression</th><th>Expression as the sum of its terms</th><th>Terms</th></tr><tr><td>13 – 2 + 6</td><td>13 + (–2) + 6</td><td>13, – 2, 6</td></tr><tr><td>5 + 6 × 3</td><td>5 + (6 × 3)</td><td></td></tr><tr><td>4 + 15 – 9</td><td>( ) + ( ) + ( )</td><td></td></tr><tr><td>23 – 2 × 4 + 16</td><td>( ) + ( ) + ( )</td><td></td></tr><tr><td>28 + 19 – 8</td><td>( ) + ( ) + ( )</td><td></td></tr></table></td><td>3</td></tr>
<tr><td>22</td><td>A metro train ticket between two stations is ₹40 for an adult and ₹20 for a child. What is the total cost of tickets:</td><td>3</td></tr>
</table>

	(i) for four adults and three children? (ii) for two groups having three adults each?	
23	A boy standing on the third stair on a staircase goes up by five more stairs. Which stair is he standing at now? At which step will he be after he comes down by 2 stairs?	3
24	Water level in a well was 20m below ground level. During rainy season, rain water collected in different water tanks was drained into the well and the water level rises 5 m above the previous level. The wall of the well is 1m 20 cm high and a pulley is fixed at a height of 80 cm. Raghu wants to draw water from the well. The minimum length of the rope that he can use is  	3
25	Raghu bought 100 kg of rice from the wholesale market and packed them into 2 kg packets. He already had four 2 kg packets. Write an expression for the number of 2 kg packets of rice he has now and identify the terms.	
26	Find out the sum of the numbers given in each picture below in at least two different ways. Describe how you solved it through expressions.	4

		
27	Using four 4's, create expressions to get all values from 1 to 20.	4
28	Using the numbers 1, 2, 3, 4, and 5 exactly once in any order get as many values as possible between – 10 and +10.	4
29	Using the numbers 0 to 9 exactly once in any order, make an expression with a value 100.	4
30	At the start of the new academic session, Mrs. Rao, the dedicated class teacher of Class 7, wanted every student to have the basic stationery needed for a smooth learning experience. She purchased 2 notebooks for each student at ₹25 each, 3 pens for each at ₹10 each, and 1 eraser for each at ₹5 each, ensuring no one lacked essential items. She distributed them among all 30 students during the first day of class. The total expense was compared to the amount collected from students.  (a) Find the total cost of all the items. (b) If ₹3000 was collected from students, how much amount is left or needed?	4

CHAPTER 3 A PEEK BEYOND THE POINT

1. The expanded form of 5.34 is:
   a) 5 + 3 + 4 b) 5 + 3/10 + 4/100
   c) 5 + 34 d) 53 + 4
2. 5 + 1/100 =
   a) 5.1 b) 5.01
   c) 5.001 d) 5.100
3. Which is greater?
   a) 0.78 b) 0.087
   c) 0.078 d) 0.87
4. 7.2 + 0.24 =
   a) 7.44 b) 7.224
   c) 7.42 d) 7.04
5. 3/1000 in decimal form is
   a) 0.003 b) 0.3
   c) 0.03 d) 3.0
6. The correct decimal for 5 m 8 cm is
   a) 5.8 m b) 5.08 m
   c) 5.008 m d) 5.80 m
7. A cricket player runs 0.9 km during warm-up and 2/3 km during practice. How much did he run in total?
   a) 1.56 b) 1.65
   c) 1.506 d) 1.605
8. A runner completes 0.65 km in the first lap and 0.9 km in the second. How much more did he run in the second lap?
   a) 0.15 b) 0.25
   c) 1.65 d) 1.55
9. The smallest decimal is
   a) 0.5 b) 0.05
   c) 0.005 d) 0.55
10. 1.2 + 3.04 + 0.5 =
    a) 4.50 b) 4.74
    c) 5.24 d) 3.84

2 Marks Questions:

11. A store offers a juice pack of 1 ½ L and another of 1.25 L. Which pack gives more juice? Show your comparison using decimal–fraction conversion.
12. You drank 3/4 L water in school and 0.65 L at home.
    How much water did you drink in total? Show your working with decimals and fractions.

13. A shopkeeper is selling honey jars labelled 250 mL, 0.3 L, and 1/5 L.
    Which one contains the least honey? Justify with conversions.
14. A student scored 0.85 of total marks in Math and 5/6 in Science.
    Which score was better? Explain your reasoning.
15. A petrol pump delivers 1.75 L petrol in a bike. The driver's manual shows fuel consumption in fractions like 7/4 L. Explain whether 1.75 L and 7/4 L are equal.
16. A cook uses 0.5 kg of sugar and 3/8 kg of flour in a recipe.
    Which quantity is more? Convert both into the same form to compare.
17. The capacity of a bucket is 12.5 L. A container holds 12 ½ L.
    Are the two buckets equally large? Prove using both fraction and decimal forms.
18. A dietitian advises a person to drink 1.2 L water in the morning and 3/5 L during exercise.
    How much should the person drink in total?

3 Marks Questions:

19. A grocery bill shows 2 items:
    – Rice: 1.2 kg
    – Pulses: 1 ⅓ kg
    How much did the family purchase in all?
20. An online shop sells a book at ₹150.25 and adds packing charges of 1/8 of the book price.
    Find total payable amount.
21. A fruit seller mixes 0.95 kg apples with 5/8 kg pears.
    What is the total weight of the fruit mix?

5 Marks Questions

22. A customer buys the following items from a supermarket:

- 1.25 kg apples
- 0.75 kg tomatoes
- 1 ½ kg onions
- 0.6 kg grapes

a) Convert all quantities either into fractions or decimals.
b) Find the total weight of items purchased.
c) If the customer carries a bag that can hold **4 kg**, will all items fit? Justify.

27. A family uses water as follows in a day:

- Morning activities: 12.5 L
- Cooking: 3.75 L
- Drinking: 2.125 L
- Cleaning: 8.5 L

a) Find total water used.
b) If their monthly limit is **900 L**, estimate whether their usage is within limits.
c) Suggest one method to reduce their water usage (reasoning skill).

28. Rita makes a decorative ribbon using:

- 3/4 m of red ribbon
- 5/8 m of green ribbon
- 1.2 m of yellow ribbon

a) Convert fractions to decimals OR decimals to fractions (any one choice).
b) Find the total length used.
c) If a ribbon roll is **3 m**, how much ribbon remains?

Case Based Questions (4 marks)

29. School Canteen Meal Sale (Fractions & Decimals)
The school canteen sells:

- Sandwich: ₹22.50
- Juice: ₹12.75
- Fruit bowl: ₹15.50

On one day, students bought:

- 18 sandwiches
- 25 juices
- 12 fruit bowls

Questions:

i. Find the total earning of the canteen.
ii. Represent each item's sale as a fraction of total items sold.
iii. Convert one of the fractions into decimals.
iv. Suggest how the canteen can reduce wastage using numerical data.

30. Science Lab Measurement

Students measure the volume of different liquids during an experiment:

- Beaker A: 125 mL
- Beaker B: 0.45 L
- Beaker C: 3/20 L

Questions:

i. Convert all measurements into litres.
ii. Find total liquid volume.
iii. Which beaker holds the smallest amount of liquid? Show comparison using decimals.
iv. Explain how accurate measurements improve experiments.

CHAPTER 4 Algebraic Expressions Using Letters and Numbers

Section A – Multiple Choice Questions (MCQs)

1. Which of the following is an algebraic expression?

a) 25 b) x + 7 c) 8 × 9 d) 100

2. In the expression 4x, 4 is the:

a) Variable b) Constant c) Coefficient d) Symbol

3. Which of the following is a variable?

a) 9 b) 12 c) x d) 5

4. The expression for '5 added to a number x' is:

a) x – 5 b) x + 5 c) 5x d) 5 – x

5. The algebraic expression for 'a multiplied by 7' is:

a) a + 7 b) a – 7 c) 7a d) a ÷ 7

6. In the expression 3y – 4, the constant term is:

a) 3 b) y c) –4 d) 1

7. Which of the following is a term?

a) x b) 3x c) 5 d) All of these

8. The value of 2x when x = 5 is:

a) 5 b) 10 c) 7 d) 15

9. The expression for 'm decreased by 9' is:

a) 9 – m b) m – 9 c) m + 9 d) 9m

10. The number of terms in 3x + 7 – y is:

a) 1 b) 2 c) 3 d) 4

11. In 12p, p is a:

a) Constant b) Variable c) Coefficient d) Term

12. Which of these is a binomial?

a) 3x b) x + 7 c) 4x – 5y + 2 d) 9

13. Which expression means 'twice a number n'?

a) n + 2 b) n – 2 c) 2n d) n ÷ 2

14. The coefficient of x in 9x – 2 is:

a) 2 b) –2 c) 9 d) 1

15. If y = 4, what is the value of y + 6?

a) 8 b) 10 c) 12 d) 14

Section B – Short Answer Questions

16. Write an expression for: '7 more than a number x'.

17. Write an expression for: '8 subtracted from m'.

18. Find the value of 3y when y = 6.

19. Identify the constant term in the expression 5a – 9.

20. Identify the coefficient of k in 12k.

21. Write the terms of the expression 4x – 3 + y.

22. Write the expression for: 'a divided by 5'.

23. Evaluate 7p when p = 3.

24. Write an algebraic expression for: 'Sum of n and 15'.

25. Determine the number of terms in 2x + 5y – 7.

26. Write the expression for: 'z multiplied by 11'.

27. Find the value of t – 4 when t = 10.

28. Identify the variable in the expression 9r – 3.

29. Write the expression for: 'Half of a number m'.

30. Write all the terms in 6k + 8 – 3m.

CHAPTER 5

Parallel Lines And Intersecting Lines

SECTION 1: MCQ

1. In Fig., if ∠a increases by 20°, what happens to ∠c?

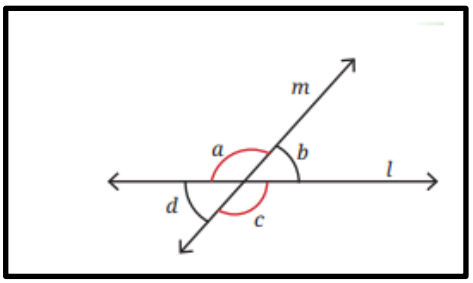
A. It decreases by 20°

B. It increases by 20°

C. It becomes 180° – ∠a

D. It remains 120°

Answer: B



2. A transversal cuts two lines such that one pair of corresponding angles is *not equal*. What conclusion is correct?

A. Lines are parallel

B. Lines are perpendicular

C. Lines will definitely intersect

D. Nothing can be concluded

Answer: C

3. A student measures vertically opposite angles as 118° and 121°. What is the best explanation?

A. Lines are not intersecting

B. The angles are not vertically opposite

C. Measurement error or thick lines

D. The concept is wrong

Answer: C

4. If two lines intersect and both linear pairs are equal, the lines must be:

A. Parallel

B. Perpendicular

C. Coinciding

D. Transversal lines

Answer: B

5. Line t intersects lines l and m. If ∠4 = ∠8, what is necessarily true?

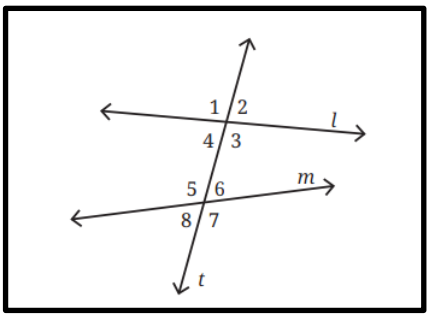
A. l ∥ m

B. t ⊥ l

C. ∠6 = 180°

D. ∠7 = 30°

Answer: A



6. A student claims that two lines are parallel because the alternate angles look equal. What is needed to confirm?

A. Measure only one angle

B. Check both pairs of alternate angles

C. Verify corresponding angles

D. Extend the lines

Answer: C

7. Which condition is *sufficient* to prove two lines are parallel?

A. Vertically opposite angles are equal
B. One linear pair adds to 180°
C. One pair of corresponding angles is equal
D. Two right angles are formed

Answer: C

8. When two lines appear parallel on a drawing but are actually not, the reason is:

A. Ideal geometry
B. Measurement error
C. Optical illusion or perspective
D. They are perpendicular

Answer: C

9. If interior angles on the same side of a transversal sum to 175°, the two lines are:

A. Parallel
B. Not parallel
C. Perpendicular
D. Coinciding

Answer: B

10. A transversal cuts two lines. ∠a = 60°, ∠b = 120° and ∠b corresponds to ∠a. What can you conclude?

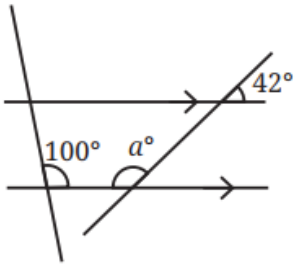
A. Lines are parallel
B. Lines are not parallel
C. Lines are perpendicular
D. No conclusion

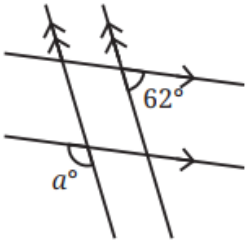
Answer: B

Subjective Questions

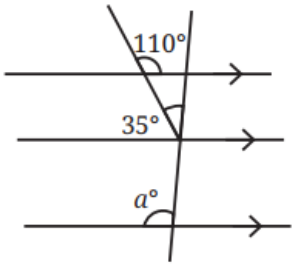
1. Define linear pair & vertically opposite angles.
2. Explain notations for parallel & perpendicular lines.
3. Define transversal & number of angles formed.
4. Define parallel lines with real-life examples.
5. Write all pairs of angles formed when a line intersects two parallel lines.
6. Draw a figure of two intersecting lines, List all linear pairs & vertically opposite angles.

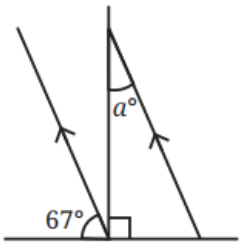
7. Find the angle represented by *a*.





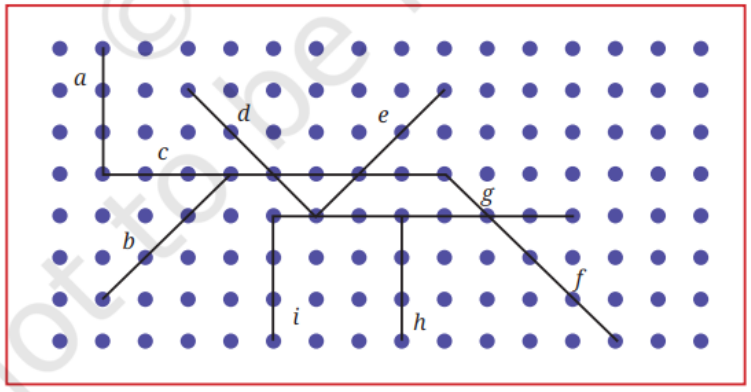
8. Find the angle represented by a.



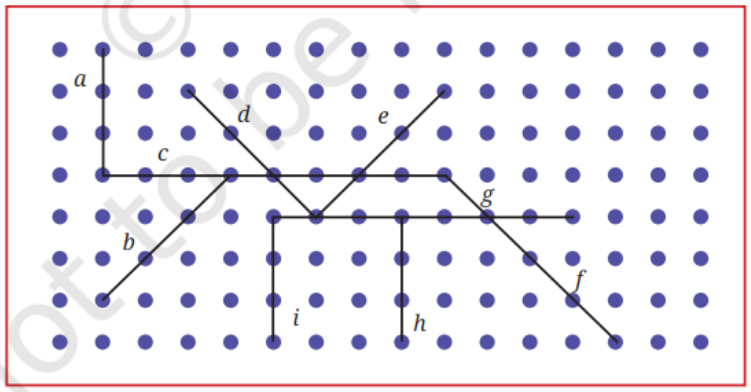


9. Define parallel lines with real-life examples.

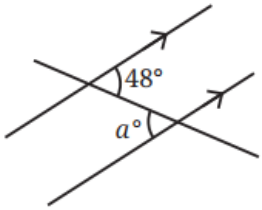
10. Identify all pairs of perpendicular lines in Fig.



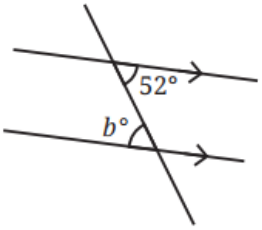
11. Identify all pairs of parallel lines in Fig.



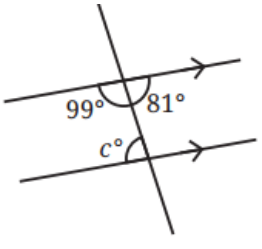
12. Find the angles marked below.



a= ☐

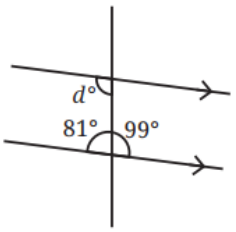


b= ☐

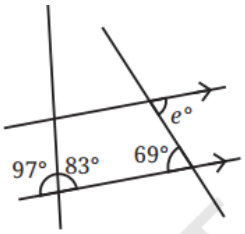


c= ☐

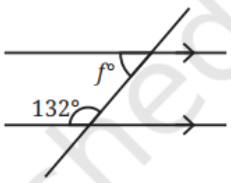
13. Find the angles marked below.



d= ☐

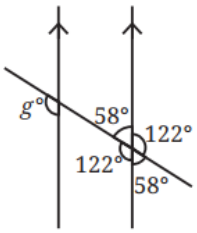


e= ☐

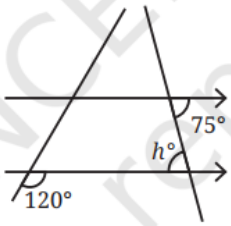


f= ☐

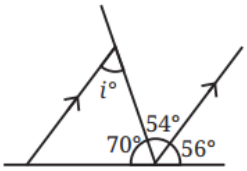
14. Find the angles marked below.



g= ☐

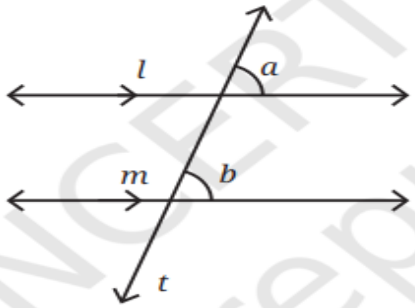


h= ☐



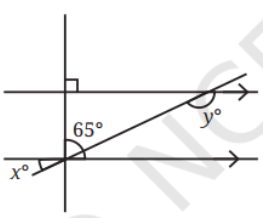
i= ☐

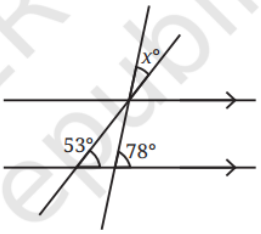
15. Verify whether ∠a = ∠b in Fig.



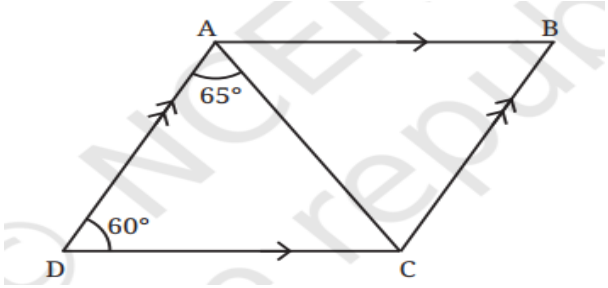
16. Steps to draw line parallel to l through point A.

17. In the figures below, what angles do *x* and *y* stand for?





18. In Fig, line segment AB is parallel to CD and AD is parallel to BC. ∠DAC is 65° and ∠ADC is 60°. What are the measures of angles ∠CAB, ∠ABC, and ∠BCD?



Case Study 1: Road Intersection Planning

The Kolkata Municipal Corporation is designing a new road layout for Salt Lake.
Two **main highways** (H1 and H2) run **parallel** to each other. A new **metro line** crosses both highways at an angle, acting as a **transversal**.

Engineers observe that the angle formed between the metro line and Highway H1 is **68°**.

1. What will be the **corresponding angle** that the metro line makes with Highway H2?
2. What will be the **alternate interior angle** on the opposite side of the transversal?
3. What is the **interior angle on the same side** of the transversal (co-interior angle)?
4. Are Highway H1 and H2 definitely parallel based on angle relationships? Explain.

Case Study 2: Railway Tracks & Footbridge

Two railway tracks run **parallel**. A **footbridge stairway** cuts across both tracks at an angle.
One angle formed between the stairway and the first track is **112°**.

1. What is the **corresponding angle** on the second track?
2. What will be the **linear pair angle** next to the 112° angle?
3. What is the value of the **vertically opposite angle**?
4. If the angle on the second track is measured as **68°**, what does it indicate about the track alignment?

CHAPTER 6 NUMBER PLAY

Multiple Choice Questions

1. Two consecutive numbers in the Virahãnka sequence are 377 and 610. What is the next number in the sequence?

(a) 987 (b) 1597 (c) 2584 (d) 4181

2. The next term of the Virahanka Fibonacci series:1, 2,3,5,8,13,21,34,_____ is

(a) 52 (b) 53 (c) 54 (d) 55

3. Assertion (A): The sum of two even numbers is always an even number.

Reason (R): The product of an even number and any number is always an even number.

(a) Both assertion and reason are true and reason is the correct explanation of the assertion.

(b) Both assertion and reason are true and reason is not the correct explanation of the assertion.

(c) Assertion is true and reason is false.

(d) Assertion is false and reason is true.

Objective Type Questions

4. Fill in the blanks

(a) The sum of two odd numbers is always _____.

(b) The sum of an even and an odd number is always _____.

(c) The product of an even and an odd number is always _____.

5. Tick the correct option:

(a) Parity of the sum of numbers from 1-20 is (even/odd).

(b) The expression (4a+2), (always/never) gives an even number.

(c) The expression (2m-1) always has an (even/odd) parity.

Answer the following:

6. The expression 4n + 3 generates numbers for different values of n. What is the parity of 4n + 3 when n = 3?

7. Anil wants to find the parity of the 10^{th} term of the Virahãnka sequence. What is the parity?

8. Solve the cryptarithm:

(a)

```
  B  B
+    A
-------
  A C C
```

(b)

```
     A
  B  B
+ C  C  C
---------
  B  A  B
```

9. Uneek wants to find all 5-beat rhythms (sums of 1's and 2's). The number of ways to write 5 as a sum of 1's and 2's is _____.

10. Ishan has number cards with values 1, 3, 5, 7, and 9. She wants to select 3 cards that sum to 21. The number of ways to select 3 cards summing to 21 is _____.

11. Priya and Rohan, two siblings born one year apart, celebrate their birthdays. Priya claims the sum of their ages is 25. Is this possible?

12. Write the next 3 numbers in the sequence: 1, 2, 3, 5, 8, 13, 21, 34, 55, 89.

13. Two consecutive numbers in the Virahãnka sequence are 987 and 1597. What are the next 2 numbers in the sequence?

14. A light bulb is OFF. A student toggles its switch 50 times. How many times is the bulb ON after 50 toggles? [Count ON state, 1 for ON, 0 for OFF.]

15. Create a magic square using 9 non- consecutive numbers whose magic sum is 18.

16. Vanshika wants to climb a 9-step staircase, taking either 1 or 2 steps at a time. In how many different ways can she reach the top?

17. In the stick – figure arrangement below, write the number each child should say (number of taller children in front).

18. If a person says '0', are they always the tallest? Explain.

19. Determine the parity (odd/even) of the sum: even + odd + odd.

20. Kishor tries to select five odd numbers to make a total of 40. Is it possible?

21. What is the parity of the number of small squares in a 7 × 8 grid without multiplying?

22. Fill the blank magic square grid using numbers 1–9 without repetition so each row sum equals 15.

23. Determine if the expression 2n + 3 is always odd or even.

24. In how many ways can 6 be written as a sum of 1s and 2s?

25. Create a magic square whose magic sum is 60.

26. Lakpa has: odd number of ₹1 coins, odd number of ₹5 coins, even number of ₹10 coins. Total = ₹219. Is this possible?

27. Create an expression that always produces odd numbers.

28. The 11th Fibonacci number is 89. Find the 12th and 10th.

29. Two siblings are born one year apart. Their ages sum to 150. Is it possible?

30. Explain why the centre of a 3×3 magic square using 1–9 must be 5.

31. Write the formula for the nth odd number.

32. Create a 3 × 3 magic square with magic sum 0 using negative integers.

33. If the parity sequence of a Fibonacci-type sequence repeats every 3 terms, show the 30th term is even.

34. Show whether all even numbers can be written as $6k - 4$ for some integer k.

35. Fill a 2×3 grid with odd/even numbers to match given row/column parities.28. Prove that a 3×3 grid using numbers 1–9 with row sums 5, 20, 30 is impossible.

36. The 25th Fibonacci number is 75025. Predict whether the 26th is odd or even without computing.

37. Prerna was living on the first floor of an apartment. The first floor can be reached by walking up a staircase consisting of 7 steps. Prerna usually climbs up by taking either 1 step each time or a maximum of 2 steps at a time. In how many ways can Prerna reach the floor?

CHAPTER 7

Reading Content: This chapter introduces key concepts and builds understanding through examples and exercises.

Ch. 7: A tale of Three intersecting lines

. Which of the following sets of side lengths can form a triangle?

a) 2m,3m, 6m b) 1m, 1m 3m

c) 4m, 5m, 7m d) 3cm, 10cm, 16m.

Q2. Two angles are of measure 80° and 60°, the measure of the third angle is:

a)30° b) 40° c) 50° d) 60°

Q 3. In triangle ABC, The <B=60°, <C=50°. The measure of ∠C is

a) 70° b)85° c) 75° d)80°

Q5. The sum of three angles of a triangle is:

a)180° b)360° c)90° (d) 270°

Q6. While the type of triangle having Side 5cm, 5cm and 6cm

a) Scalene triangle b) Equilateral triangle

(c) Isosceles triangle (d) None of these

Q7. Triangle having all sides are of different lengths is called the

a) scalene triangle c) equilateral triangle

b) isosceles triangle d) obtuse angles triangle

Q7. A triangle having all angles are same measure is known as:

a) Equilateral triangle. b) equiangular triangle

c) both a and b are correct d) both a and b are wrong

Q8.The measure of acute angles of an isosceles right angle triangle is:

a)45° b) 55° c)60° d)90°

Q9. In a triangle ABC, the exterior angle B is 130°, ∠A=50°, the measure of ∠C is

a)80°. b)90°. c)50°. d)70°

Q10. If one angle of a triangle is more than 90°, the triangle is called

a) obtuse angled triangle b) acute angled triangle

c) right angled triangle d) equilateral triangle

Q11. Construct the triangle having sides 6cm each using compass and ruler.

Q12. Construct the triangle having sides lengths 4 cm, 4cm and 5 cm using compass and ruler

Q13. Construct the triangle having two angles 40° and 60°, using compass and ruler

Q14. Construct a right angled triangle of any measure using compass and ruler

Q15. Construct the following angle using compass and ruler 30°, 60°, 45°, 90°, 120°,75°.

Q16. Construct the triangle having two sides of length 5cm and 6 cm and the angle between them is 75°

CBQ Questions –

1. Three lines intersect at point A in such a way that one angle is 40°. What will be the measure of its vertically opposite angle?

2. A line L intersects line M and forms a linear pair of angles. If one angle measures 115°, find the measure of the other angle.

3. Two lines intersect and form one angle of 75°. Identify any two other pairs of angles formed at the point of intersection.

4. Three lines P, Q, R meet at point O. If $\angle POQ = x$, $\angle QOR = 48^\circ$, and $\angle ROP = 62^\circ$, find the value of x using angle sum around a point.

5. When two lines intersect, four angles are formed. Explain with an example how vertically opposite angles are always equal.

6. A transversal line cuts two lines and creates an interior angle of 70°. What will be the measure of the alternate interior angle?

7. If a pair of lines intersect and make adjacent angles of 110° and 70°, justify how they form a linear pair.

8. Lines AB and CD intersect at O. If $\angle AOC = 125^\circ$, what is the measure of $\angle BOD$? Explain your reasoning.

9. A student observes the window grill at home and identifies that the rods form intersecting lines. Which mathematical angles can they identify in this structure and how?

10. A traffic junction has three roads meeting at a point. If one angle between two roads is 100°, and the second angle is 50°, find the third angle.

11. A transversal cuts two parallel lines and forms corresponding angles of 45°. What will be the other corresponding angle on the opposite side?

12. A carpenter marks two lines that intersect and makes an angle of 95°. What will be the measure of the angle adjacent to it? Justify.

13. Identify any real-life example where three or more lines intersect at a point and describe the types of angles formed there.

14. At a roundabout, three roads intersect. If one angle is twice the second angle, and the third angle is 60°, form an equation and find all three angles.

15. If two lines intersect and one of the angles is x + 20° while its vertically opposite angle is 60°, find the value of x.

16. A transversal intersects two parallel lines making an exterior angle of 85°. What will be its corresponding interior angle?

17. Using the concept of intersecting lines, explain how the sum of all angles formed around a point is always 360°, taking an example.

18. Lines l and m intersect such that one angle is 30°. Show how the other three angle measures can be calculated.

19. At a railway crossing, the tracks intersect forming vertically opposite angles. If one of the angles is 140°, find the measures of the other 3 angles.

20. Two lines intersect at point P. One angle is three times its adjacent angle. Form an equation and find the measure of both angles.

CHAPTER 8

1. Which of the following is not in the lowest form?

(a) 7/5 (b) 15/20 (c) 13/33 (d) 27/28

2. The fraction which is not equal to 4/5 is

(a) 40/50 (b) 12/15 (c) 16/20 (d) 9/15

3. If (5/8) = (20/p), then value of p is

(a) 23 (b) 2 (c) 32 (d) 16

4. Which of the following fractions is the greatest?

(a) 5/7 (b) 5/6 (c) 5/9 (d) 5/8

5. Sum of 4/17 and 15/17 is

(a) 19/17 (b) 11/17 (c) 19/34 (d) 2/17

6. The mixed fraction $5\frac{4}{7}$ can be expressed as

(a) 33/7 (b)39/7 (c) 33/4 (d) 39/4

9. The simplest form of $\frac{48}{60}$ is

(a) $\frac{5}{4}$ (b) $\frac{4}{5}$ (c) $\frac{8}{10}$ (d) $\frac{12}{15}$

10. Which one of the following is a proper fraction?

(a) $\frac{5}{6}$ (b) $\frac{7}{3}$ (c) $\frac{4}{3}$ (d) $\frac{8}{5}$

7. The equivalent fraction of $\frac{3}{5}$ with denominator 20 is

(a) $\frac{12}{20}$ (b) $\frac{20}{12}$ (c) $\frac{10}{20}$ (d) $\frac{15}{20}$

8. The equivalent fraction of $\frac{3}{5}$ with numerator 9 is

(a) $\frac{15}{9}$ (b) $\frac{9}{11}$ (c) $\frac{9}{15}$ (d) $\frac{9}{5}$

11. A farmer had 5 grandchildren. She distributed $\frac{2}{3}$ acre of land to each of her grandchildren.

12. 1 hour of internet time costs ₹8. How much will $1\frac{1}{4}$ hours of internet time cost?

13. Subtract (a) $\frac{2}{9}$ and $\frac{7}{9}$

14. Tenzin drinks $\frac{1}{2}$ glass of milk every day. How many glasses of milk does he drink in a week? How many glasses of milk did he drink in the month of January?

15. Manju and two of her neighbours buy 5 litres of oil every week and share it equally among the 3 families. How much oil does each family get in a week?

16. Renu did $\frac{1}{2}$ of the work yesterday and one-third of the work today. How much work will she have to do tomorrow to the complete the work?

17. In a class A of 25 students, 20 passed in first class; in another class B of 30 students, 24 passed in first class. In which class was a greater fraction of students getting first class?

18. Find the area of a rectangle of sides $3\frac{3}{4}$ ft and $9\frac{3}{5}$ ft.

19. Which is heavier: $\frac{12}{15}$ of 500 grams or $\frac{3}{20}$ of 4 kg?

20. A piece of wire $3\frac{2}{4}$ metre long broke into two pieces. One piece was $\frac{5}{8}$ metre long. How long is the other piece?

21. A car runs 16 km using 1 litre of petrol. How far will it go using $2\frac{3}{4}$ litres of petrol?

22. If $\frac{1}{4}$ kg of flour is used to make 12 rotis, how much flour is used to make 6 rotis?

23.

Re-arrange the given fractions in ascending order: $\frac{7}{15}, \frac{11}{21}$ and $\frac{13}{35}$

24.

Evaluate the following:

$3 \div \frac{7}{9}$	$\frac{14}{4} \div 2$	$\frac{2}{3} \div \frac{2}{3}$	$\frac{14}{6} \div \frac{7}{3}$
$\frac{4}{3} \div \frac{3}{4}$	$\frac{7}{4} \div \frac{1}{7}$	$\frac{8}{2} \div \frac{4}{15}$	
$\frac{1}{5} \div \frac{1}{9}$	$\frac{1}{6} \div \frac{11}{12}$	$3\frac{2}{3} \div 1\frac{3}{8}$	

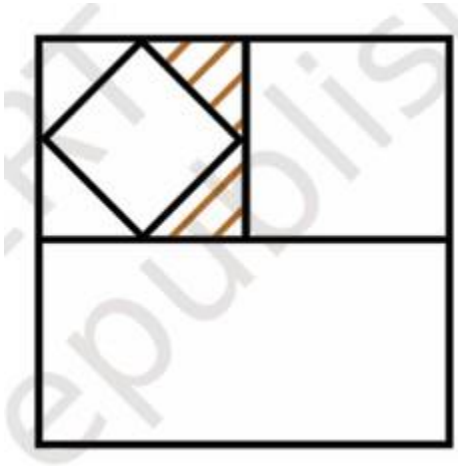
25. Mira is reading a novel that has 400 pages. She read $\frac{1}{5}$ of the pages yesterday and $\frac{3}{10}$ of the pages today. How many more pages does she need to read to finish the novel?

26. Amritpal decides on a destination for his vacation. If he takes a train, it will take him $5\frac{1}{6}$ hours to get there. If he takes a plane, it will take him $\frac{1}{2}$ hour. How many hours does the plane save?

27. Mariam's grandmother baked a cake. Mariam and her cousins finished $\frac{4}{5}$ of the cake. The remaining cake was shared equally by Mariam's three friends. How much of the cake did each friend get?

28. What fraction of the whole square is shaded?

29. What fraction of the whole square is shaded?



30. What is $1 - \frac{1}{2}$?

- $(1 - \frac{1}{2}) \times (1 - \frac{1}{3})$?
- $(1 - \frac{1}{2}) \times (1 - \frac{1}{3}) \times (1 - \frac{1}{4})$?
- $(1 - \frac{1}{2}) \times (1 - \frac{1}{3}) \times (1 - \frac{1}{4}) \times (1 - \frac{1}{5})$?
- $(1 - \frac{1}{2}) \times (1 - \frac{1}{3}) \times (1 - \frac{1}{4}) \times (1 - \frac{1}{5}) \text{x} (1 - \frac{1}{6}) \times (1 - \frac{1}{7}) \times (1 - \frac{1}{8}) \times (1 - \frac{1}{9})$?

Make a general statement and explain.