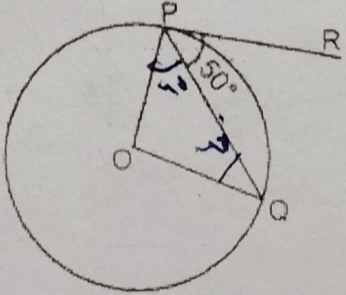


SECTION A

Section A consist of 20 Questions of 1 mark each.

- | | | |
|-----|--|---|
| 1. | If the numbers $x - 2$, $4x - 1$ and $5x + 2$ are in AP, then the value of x is:
(a) 3 (b) 4 (c) 1 (d) 2 | 1 |
| 2. | The distance between $A(1,3)$ and $B(x, 7)$ is 5 units, then the possible values of x are:
(a) 4, -2 (b) 2, 4 (c) 3, 2 (d) 2, 5 | 1 |
| 3. | The 11 th term of the AP: $-5, -5/2, 0, 5/2, \dots$ is:
(a) (-20) (b) 20 (c) 10 (d) (-10) | 1 |
| 4. | Which are the zeroes of the polynomial, $p(x) = x^2 - 8x + 15$?
(a) 5, -2 (b) -5, 2 (c) 5, 3 (d) 2, 3 | 1 |
| 5. | If two positive integers A and B can be expressed as $A = xy^3$ and $B = x^4y^2z$; x, y, z being prime numbers then HCF (A, B) is:
(a) x^4y^3 (b) x^4y^2z (c) xy^2z (d) xy^2 | 1 |
| 6. | $ABCD$ is a rectangle whose three vertices are $B(4, 0)$, $C(4, 3)$ and $D(0, 3)$. Calculate the length of one of its diagonals:
(a) 4cm (b) 3cm (c) 5cm (d) 8cm | 1 |
| 7. | If $\sin \theta - \cos \theta = 0$ then the value of $\sec \theta$ is:
(a) $\frac{1}{2}$ (b) $\sqrt{2}$ (c) 1 (d) $\frac{1}{\sqrt{2}}$ | 1 |
| 8. | What is the minimum value of $\sin A$, $0 \leq A \leq 90^\circ$
(a) -1 (b) 0 (c) 1 (d) $\frac{1}{2}$ | 1 |
| 9. | In figure if O is centre of a circle, PQ is a chord and the tangent PR at P makes an angle of 50° with PQ , then $\angle POQ$ is equal to:
<div style="text-align: center;">  </div> | 1 |
| 10. | Volumes of two spheres are in the ratio 64:27. The ratio of their surface areas is:
(a) 3:4 (b) 4:3 (c) 9:16 (d) 16:9 | 1 |
| 11. | The probability of getting 53 Fridays in a leap year.
(a) $\frac{1}{7}$ (b) $\frac{2}{7}$ (c) $\frac{3}{7}$ (d) 1 | 1 |
| 12. | A letter of the English alphabet is chosen at random. The probability that the chosen letter is a consonant is
(a) $\frac{21}{26}$ (b) $\frac{5}{26}$ (c) $\frac{6}{25}$ (d) 1 | 1 |

$$\sqrt{(x-1)^2 + (7-3)^2}$$

$$\sqrt{x^2 + 1 - 2x + 16}$$

$$\sqrt{x^2 - 2x + 17} = 5$$

13.	The perimeter of a quadrant of a circle of radius r is (a) $\frac{\pi r}{2}$ (b) $\frac{r}{2}(\pi+4)$ (c) πr (d) $\frac{\pi r}{4}$	
14.	In ΔABC , D and E are the points on the sides AB and AC respectively such that $DE \parallel BC$. If $AD = 6x - 7$, $DB = 4x - 3$, $AE = 3x - 3$, and $EC = 2x - 1$ then the value of x is: (a) 1 (b) 2 (c) 0 (d) (-1)	
15.	The numbers are arranged in ascending order. If their median is 25, then $x = ?$ 5, 7, 10, 12, $2x-8$, $2x+10$, 35, 41, 42, 50 (a) 10 (b) 11 (c) 12 (d) 9	
16.	The pair of linear equation $3x + 5y = 3$ and $6x + ky = 8$ do not have a solution, if k is: (a) 5 (b) 10 (c) 15 (d) 20	
17.	If a pair of linear equations is consistent, then the lines will be (a) always coincident (b) parallel (c) always intersecting (d) intersecting or coincident	
18.	XY is drawn parallel to the base BC of a ΔABC cutting AB at X and AC at Y . If $AB = 4\text{cm}$, $BX = YC = 2\text{cm}$, then AY is (a) 2cm (b) 4cm (c) 6 cm (d) 8cm	
19.	<p>DIRECTION: In question numbers 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.</p> <p>Assertion(A): $(2x - 1)^2 - 4x^2 + 5 = 0$ is a quadratic equation. Reason(R): An equation of the form $ax^2 + bx + c = 0$, $a \neq 0$, where $a, b, c \in R$ is called a quadratic equation.</p> (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason (R) is true.	
20.	<p>Assertion: A circle can be divided into sectors of equal area. Reason: The area of each sector depends only on the total area of the circle and the number of sectors.</p> (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason (R) is true.	

SECTION B

Section B consist of 5 Questions of 2 marks each

21 The LCM of two numbers is 14 times their HCF. The sum of LCM and HCF is 600. If one number is 280, then find the other number. 2

22 If $\cos(A + B) = \frac{1}{2}$ and $\tan(A - B) = \frac{1}{\sqrt{3}}$ where $0 \leq A + B \leq 90^\circ$, then find the value of $\sec(2A - 3B)$. 2

OR

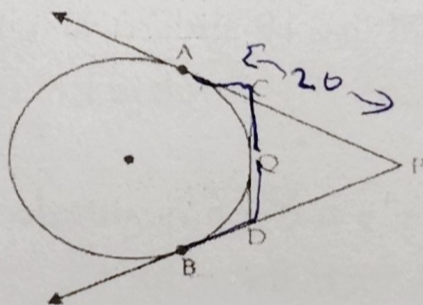
Find the value of x such that, $3 \tan^2 60^\circ - x \sin^2 45^\circ + \frac{3}{4} \sec^2 30^\circ = 2 \operatorname{cosec}^2 30^\circ$.

23 If α and β are zeroes of the polynomial $p(x) = x^2 - x - 2$, then find the value of $(\alpha^2 + \beta^2)$ 2

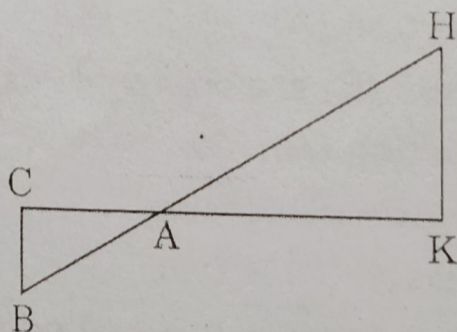
OR

If $(\frac{2}{3})$ and (-3) are the zeros of the polynomial $ax^2 + 7x + b$, then find the values of a and b .

24 Two tangents are drawn to a circle from an external point P , touching the circle at the points A and B and a third tangent intersects segment PA in C and segment PB in D and touches the circle at Q . If $PA = 20$ units, then find the perimeter of $\triangle PCD$. 2



25 In the given figure, $\triangle AHK \sim \triangle ABC$. If $AK = 8$ cm, $BC = 3.2$ cm and $HK = 6.4$ cm, then find the length of AC . 2



SECTION C

Section C consist of 6 Questions of 3 marks each

26 Prove that: $(1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) = 2$

27 Three coins are tossed simultaneously. What is the probability of getting
 (i) at least one head?
 (ii) exactly two tails? 3

- (iii) at most one
- 28 Prove that $3 - 7\sqrt{2}$ is an irrational number, given that $\sqrt{2}$ is an irrational number 3
- 29 The sum of the digits of a 2-digit number is 9. Seven times the number is equal to four times the number obtained by reversing the order of the digits. Find the number. 3

OR

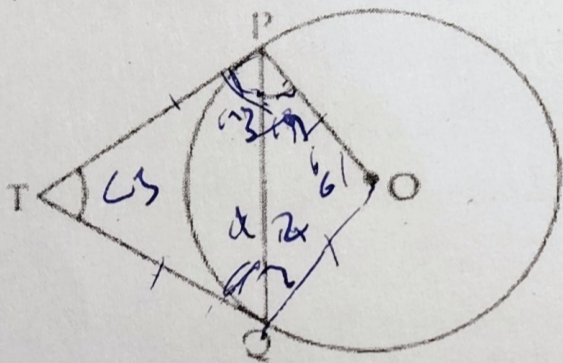
Find the values of x and y from the following pair of linear equations:

$$62x + 43y = 167$$

$$43x + 62y = 148$$

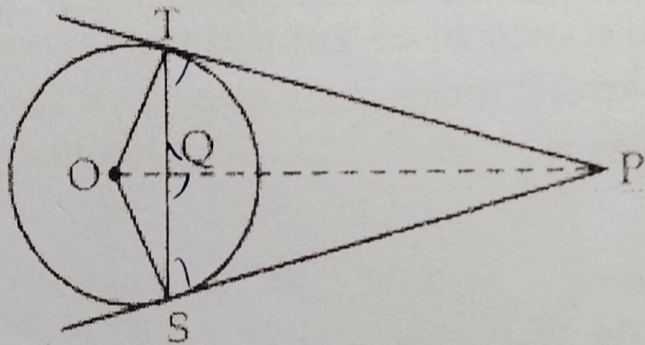
- 30 Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$. 3

$\angle 1 + \angle 2 + \angle 3 + \angle 4 = 25 + 25 = 50^\circ$
 $2\angle 2 + 2\angle 4 = 70$
 $2(\angle 2 + \angle 4) = 180$
 $\angle 2 + \angle 4 = 90$
 $\angle PTQ = 2(\angle 2 + \angle 4) = 180$



OR

In figure, from an external point P, two tangents PT and PS are drawn to a circle with centre O and radius r . If $OP = 2r$, show that $\angle OTS = \angle OST = 30^\circ$.

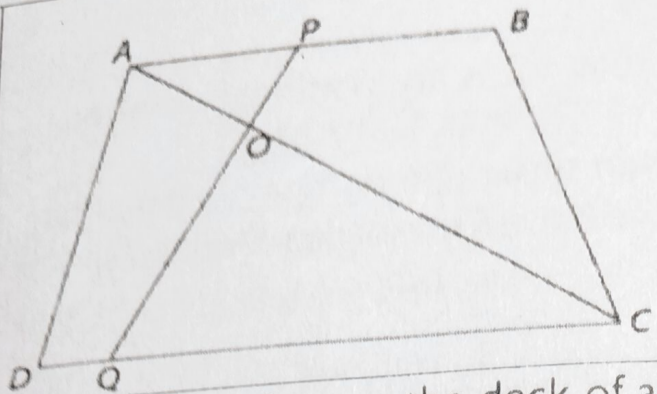


- 31 A tent is in the shape of a cylinder surmounted by a conical top of same diameter. If the height and diameter of cylindrical part are 2.3 m and 3 m respectively and the height of conical part is 0.8 m, find the cost of canvas needed to make the tent if the canvas is available at the rate of ₹ 500/sq. metre. 3

SECTION D

Section D consist of 4 Questions of 5 marks each

- 32 (a) Prove that, if a line is drawn parallel to one side of a triangle to intersect the other two sides, then the two sides are divided in the same ratio. 5
- (b) In figure, $AB \parallel DC$ and AC and PQ intersect each other at the point O. Prove that $OA \cdot CQ = OC \cdot AP$



33 Aman is standing on the deck of a ship, which is 8 m above water level. He observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of the hill as 30° . Calculate the distance of the hill from the ship and the height of the hill.

5

34 The following table shows the ages of the patient admitted in a hospital during a year

5

Age in years	5-15	15-25	25-35	35-45	45-55	55-65
Number of patients	6	11	21	23	14	5

Find the mode and the mean of the data given above.

OR

The median of the distribution given below is 14.4. Find the values of x and y , if the sum of frequency is 20.

Class interval	0 -6	6-12	12-18	18-24	24-30
Frequency	4	X	5	Y	1

35 A train travels at a certain average speed for a distance of 63 km and then travels at a distance of 72 km at an average speed of 6 km/hr more than its original speed. If it takes 3 hours to complete total journey, what is the original average speed?

5

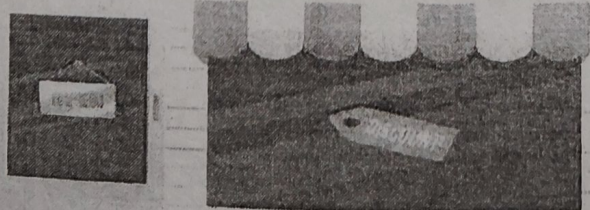
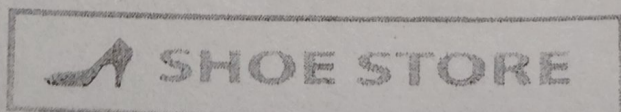
OR

A motor boat whose speed is 18 km/hr in still water takes 1 hr more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

SECTION - E

Section E consist of 3 Questions of 4 marks each

36 Ravi's mother starts a new shoe shop. To display the shoes, she put 3 pairs of shoes in 1st row, 5 pairs in 2nd row, 7 pairs in 3rd row and so on till the 20th row.



Handwritten notes: AP , AO , OP , $AO = OP$



Use the above information to answer the questions that follow:

- (i) Find the common difference of the sequence formed.
- (ii) How many pairs of shoes are in the 10th row?
- (iii) Identify the row which contains 33 pairs of shoes.

1
1
2

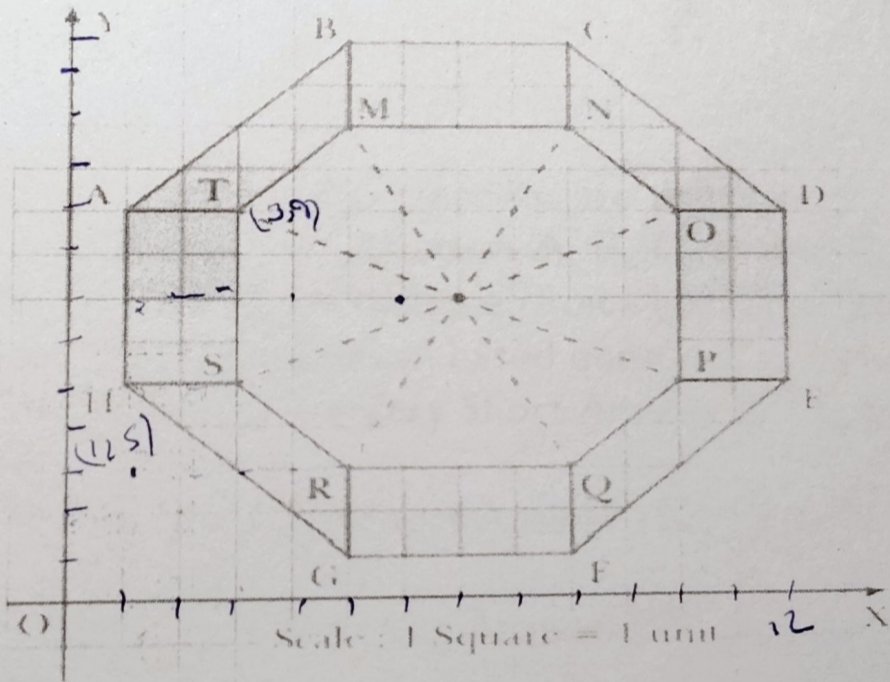
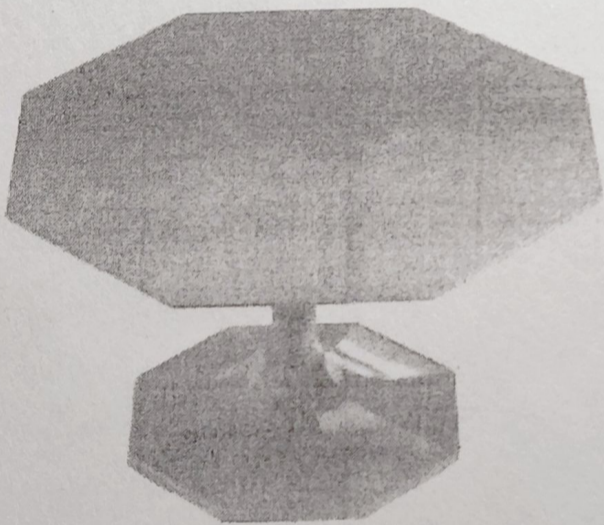
OR

- (iii) Find the total number of pairs of shoes in all 20 rows.

2

The top of a table is shown in the figure given below.

37



- (i). Write the coordinates of the point B and E.
- (ii). Write any two points having the same ordinate.
- (iii). Find the distance between the points T and H

1
1
2

OR

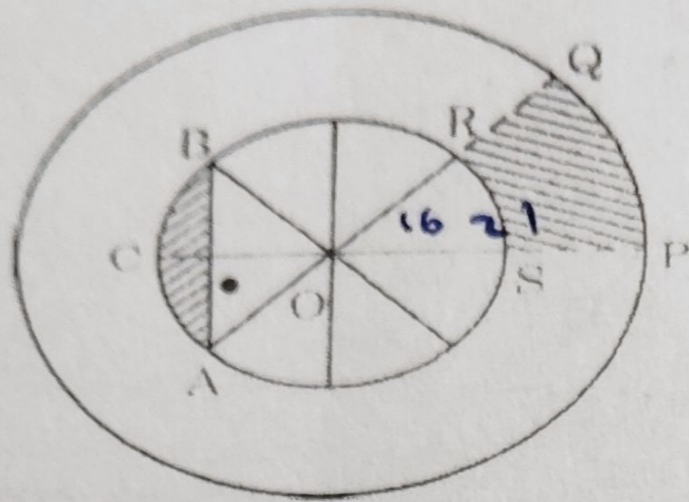
- (iii). Find the midpoint of the line segment GM.

2

38

NSS (National Service Scheme) aims to connect the students to the community and to involve them in problem solving process. NSS symbol is based on the 'Rath' wheel of the Konark Sun Temple situated in Odisha. The wheel

signifies the progress cycle of life. The diagrammatic representation of the symbol is given.



Observe the figure given above. The diameters of inner circle are equally placed. Given that $OP = 21$ cm, $OS = 10$ cm.

Based on the above information, answer the following questions:

- (i) Find $m\angle ROS$.
- (ii) Find the length of the arc PQ .
- (iii) Find the area of shaded region $PQRS$.

OR

- (iii) Find the area of the segment ACB .