

Self Assessment Paper

Section 'A'

Question numbers 1 to 10 carry 1 mark each

AI 1. If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$; x, y are prime numbers, then HCF (a, b) is :

- (a) xy . (b) xy^2 . 1
 (c) x^3y^3 . (d) x^2y^2 .

2. If one of the zeroes of the cubic polynomial $x^3 + ax^2 + bx + c$ is -1 , then the product of the other two zeroes is :

- (a) $b - a + 1$ (b) $b - a - 1$
 (c) $a - b + 1$ (d) $a - b - 1$ 1

OR

Which of the following is a quadratic equation?

- (a) $x^2 + 2x + 1 = (4 - x)^2 + 3$ (b) $-2x^2 = (5 - x)\left(2x - \frac{2}{5}\right)$
 (c) $(k + 1)x^2 + \frac{3}{2}x = 7$, where $k = -1$ (d) $x^3 - x^2 = (x - 1)^3$

3. 11th term of the A.P., : $-3, -\frac{1}{2}, 2, \dots$ is :

- (a) 28 (b) 22
 (c) -38 (d) $-48\frac{1}{2}$ 1

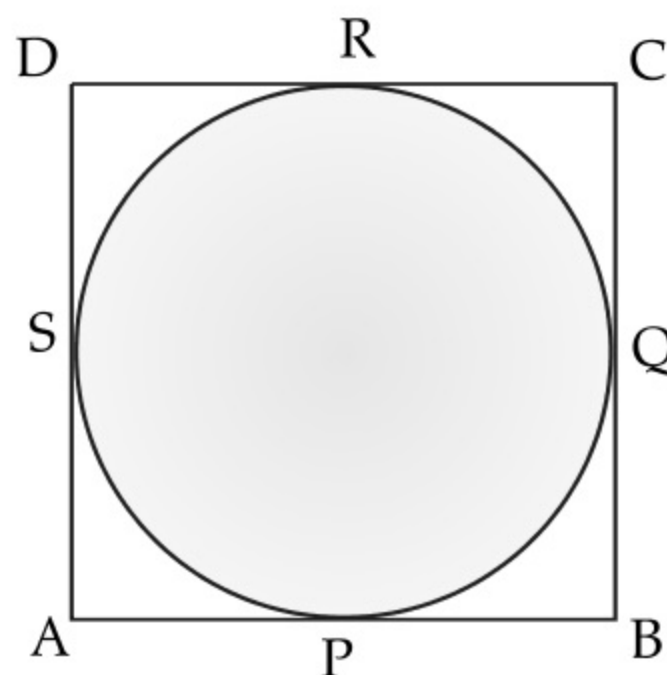
4. If the distance between the points $(4, p)$ and $(1, 0)$ is 5, then the value of p is :

- (a) 4 only (b) ± 4
 (c) -4 only (d) 0 1

5. In two triangles ABC and PQR, $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$ then :

- (a) $\Delta PQR \sim \Delta CAB$ (b) $\Delta PQR \sim \Delta ABC$
 (c) $\Delta CBA \sim \Delta PQR$ (d) $\Delta BCA \sim \Delta PQR$ 1

6. In figure, a quadrilateral ABCD is drawn to circumscribe a circle such that its sides AB, BC, CD and AD touch the circle at P, Q, R and S respectively. If $AB = x$ cm, $BC = 7$ cm, $CR = 3$ cm and $AS = 5$ cm, find x :



- (a) 10 (b) 9
 (c) 8 (d) 7 1

7. $\frac{2 \tan 30^\circ}{1 - \tan^2 30^\circ} =$

- (a) $\cos 60^\circ$ (b) $\sin 60^\circ$
 (c) $\tan 60^\circ$ (d) $\sin 30^\circ$

1

8. The area of the circle that can be inscribed in a square of side 6 cm is :

- (a) $36\pi \text{ cm}^2$ (b) $18\pi \text{ cm}^2$
 (c) $12\pi \text{ cm}^2$ (d) $9\pi \text{ cm}^2$

1

OR

A surahi is the combination of :

- (a) a sphere and a cylinder (b) a hemisphere and a cylinder
 (c) two hemispheres (d) a cylinder and a cone

1

9. For the following distribution :

Class	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25
Frequency	10	15	12	20	9

the sum of lower limits of median class and modal class is :

- (a) 15 (b) 25
 (c) 30 (d) 35

1

[AI] 10. In a family of 3 children, the probability of having at least one boy is :

- (a) $\frac{7}{8}$ (b) $\frac{1}{8}$
 (c) $\frac{5}{8}$ (d) $\frac{3}{4}$

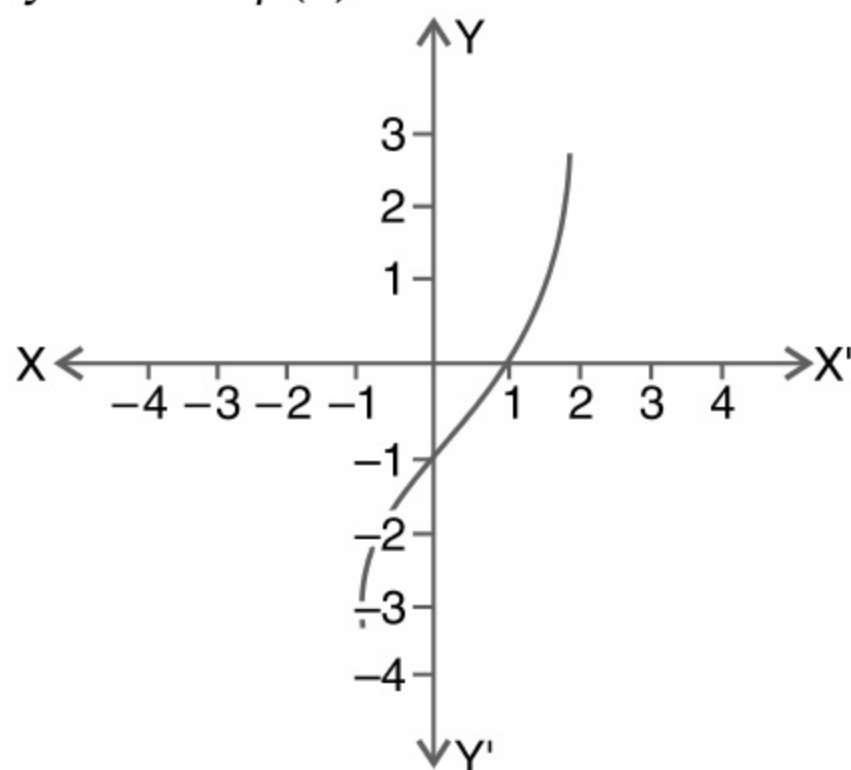
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Question numbers 11 to 20 carry 1 mark each

11. Show that $5\sqrt{6}$ is an irrational number.

1

12. In given figure, the graph of a polynomial $p(x)$ is shown. Calculate the number of zeroes of $p(x)$.



1

13. The first three terms of an A.P. are $3y - 1$, $3y + 5$ and $5y + 1$ respectively then find y .

1

14. The distance between the points $(0, 5)$ and $(-5, 0)$ is :

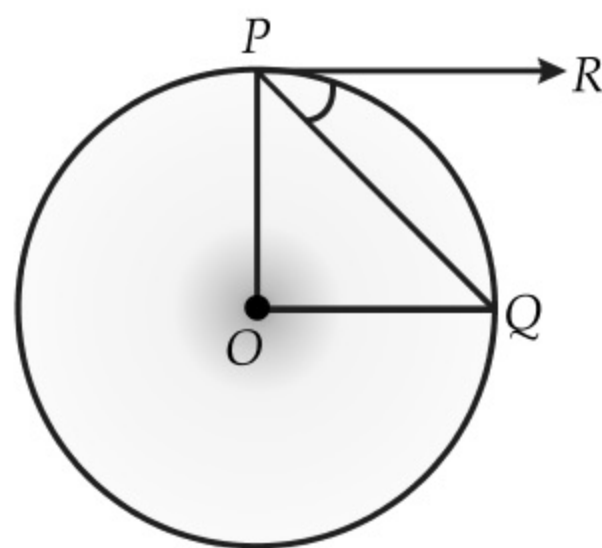
- (a) 5 (b) $5\sqrt{2}$
 (c) $2\sqrt{5}$ (d) 10

1

15. If $\Delta ABC \sim \Delta QRP$, $\frac{ar(\Delta ABC)}{ar(\Delta QRP)} = \frac{9}{4}$, and $BC = 15$ cm, then find PR .

1

16. If O is centre of a circle, PQ is a chord and the tangent PR at P makes an angle of 50° with PQ , find $\angle POQ$. 1



17. If $\tan(3x + 30^\circ) = 1$, then find the value of x . 1
18. The radius of a circle whose circumference is equal to the sum of the circumferences of the two circles of diameters 36 cm and 20 cm is :

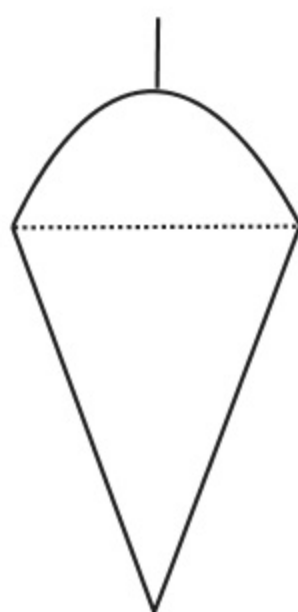
- (a) 56 cm (b) 42 cm
 (c) 28 cm (d) 16 cm

1

OR

A plumbline (Sahul) is the combination of :

- (a) a cone and a cylinder (b) a hemisphere and a cone
 (c) frustum of a cone and a cylinder (d) sphere and cylinder



19. From the following frequency distribution, find the median class : 1

Cost of living index	1400 – 1550	1550 – 1700	1700 – 1850	1850 – 2000
Number of weeks	8	15	21	8

1

20. If the probability of an event is p , then the probability of its complementary event will be :

- (a) $p - 1$ (b) p
 (c) $1 - p$ (d) $1 - \frac{1}{p}$

1

Section 'B'

Question numbers 21 to 26 carry 2 marks each

21. Find a quadratic polynomial, the sum and product of whose zeroes are 6 and 9 respectively. Hence find the zeroes. 2

OR

Is the system of linear equations $2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$ consistent? Justify your answer. 2

- AI** 22. Solve the following quadratic equation for x :

$$4\sqrt{3}x^2 + 5x - 2\sqrt{3} = 0$$

2

23. For A.P. show that $a_p + a_{p+2q} = 2a_{p+q}$. 2

24. Find the ratio in which the point $P\left(\frac{3}{4}, \frac{5}{12}\right)$ divides the line segment joining the point $A\left(\frac{1}{2}, \frac{3}{2}\right)$ and $B(2, -5)$. 2

25. Evaluate : $\frac{\sin 90^\circ}{\cos 45^\circ} + \frac{1}{\operatorname{cosec} 30^\circ}$ 2

26. The mean and median of 100 observations are 50 and 52 respectively. The value of the largest observation is 100. It was later found that it is 110 not 100. Find the true mean and median. 2

OR

A bag contains cards bearing numbers from 11 to 30. A card is taken out from the bag at random. Find the probability that the selected card has multiple of 5 on it. 2

Section 'C'

Question numbers 27 to 34 carry 3 marks each

27. A bag contains, white, black and red balls only. A ball is drawn at random from the bag. If the probability of getting a white ball is $\frac{3}{10}$ and that of a black ball is $\frac{2}{5}$, then find the probability of getting a red ball. If the bag contains 20 black balls, then find the total number of balls in the bag. 3

28. The table below gives the distribution of villages under different heights from sea level in a certain region :

Height (in metre)	200	600	1000	1400	1800	2200
No. of Villages	142	265	560	271	89	16

(i) Compute the mean height of the region.

(ii) Which mathematical concept is used in this problem ? 3

29. A hollow cylindrical pipe is made up of copper. It is 21 dm long. The outer and inner diameters of the pipe are 10 cm and 6 cm respectively. Find the volume of copper used in making the pipe.

OR

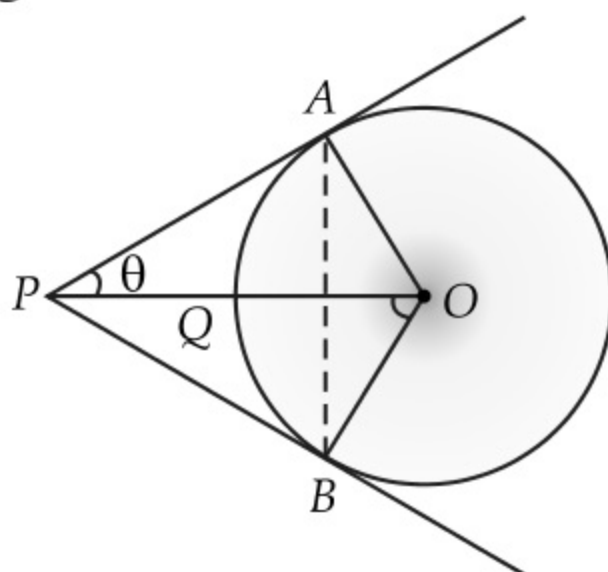
Find the area of minor segment of a circle of radius 14 cm, when its central angle is 60° . Also, find the area of corresponding major segment.

[Use $\pi = \frac{22}{7}$]

3

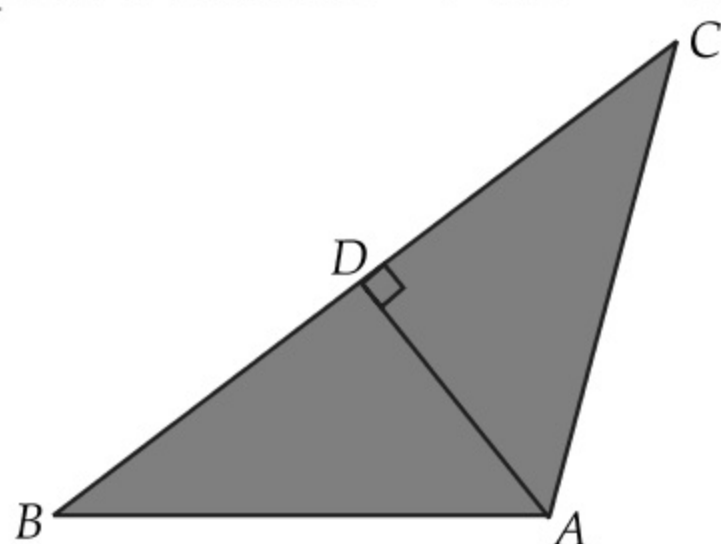
30. Evaluate : $\frac{5\cos^2 60^\circ + 4\cos^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 60^\circ}$ 3

31. In the given figure, OP is equal to the diameter of a circle with centre O and PA and PB are tangents. Prove that ABP is an equilateral triangle. 3



OR

In the given figure, if $AD \perp BC$, prove that $AB^2 + CD^2 = BD^2 + AC^2$.



3

32. Find the area of a triangle ABC with $A(1, -4)$ and mid-points of sides through A being $(2, -1)$ and $(0, -1)$. 3

AI 33. In an A.P. the sum of first n terms is $\frac{3n^2}{2} + \frac{13n}{2}$. Find the 25th term. 3

OR

The sum of the squares of two consecutive natural numbers is 421. Find the numbers.

34. Using Euclid's division algorithm find the HCF of the numbers 867 and 255. 3

Section 'D'

Question numbers 35 to 40 carry 4 marks each

35. 4 chairs and 3 tables cost ₹ 2100 and 5 chairs and 2 tables cost ₹ 1750. Find the cost of one chair and one table separately. 4

OR

Find the positive value of k for which $x^2 - 8x + k = 0$, will have real roots. 4

36. A sum of ₹ 280 is to be used towards four prizes. If each prize after the first is ₹ 20 less than its preceding prize, find the value of each of the prizes. 4

37. Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm. 4

38. An angle of elevation of a cloud from a point 60 m above the surface of the water of a lake is 30° and the angle of depression of its shadow in water is 60° . Find the height of the cloud from the surface of water. 4

OR

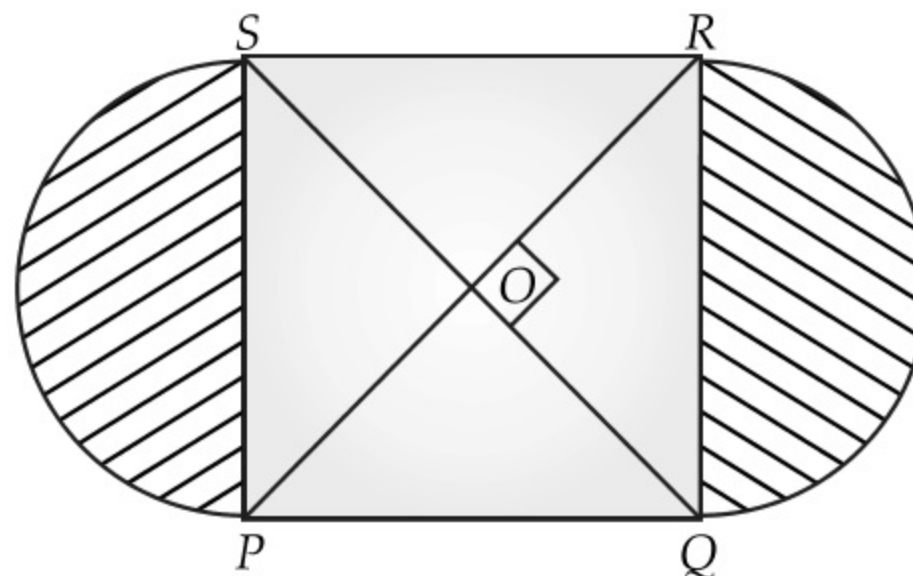
AI An aeroplane is flying at a height of 300 m above the ground. Flying at this height the angle of depression from the aeroplane of two points on both banks are 45° and 60° respectively. Find the width of the river.

39. In an orchard, the numbers of apples on trees are given below :

Number of apples	More than or equal to 50	More than or equal to 60	More than or equal to 70	More than or equal to 80	More than or equal to 90	More than or equal to 100	More than or equal to 110
Number of trees	60	55	39	29	10	6	2

Draw a 'more than type' ogive and hence obtain median from the curve. 4

40. In figure, $PQRS$ is square lawn with side $PQ = 42$ metre. Two circular flower beds are there on the sides PS and QR with centre at O , the intersection of its diagonals. Find the total area of the two flower beds (shaded parts). 4



OR

AI A bucket open at the top is in the form of a frustum of a cone with a capacity of 12308.8 cm^3 . The radii of the top and bottom circular ends are 20 cm and 12 cm respectively. Find the height of the bucket and the area of metal sheet used in making the bucket. (Use $\pi = 3.14$)