Sample Question Paper 2

Section 'A'

Question numbers 1 to 10 carry 1 mark each

1. A number is selected at random from the numbers 1 to 30. The probability that it is a prime number is :

(a) $\frac{2}{3}$ **(b)** $\frac{1}{6}$

(c) $\frac{1}{3}$ **(d)** $\frac{11}{30}$ **1**

2. During conversion of a solid from one shape to another, the volume of new shape will :

(a) increase **(b)** decrease

(c) remains unaltered **(d)** be doubled **1**

3. The diameter of a circle whose area is equal to the sum of the areas of the two circles of radii 24 cm and 7 cm is :

(a) 31 cm **(b)** 25 cm

(c) 62 cm **(d)** 50 cm **1**

4. If $\sin A = \frac{1}{2}$ then the value of $\cot A$ is :

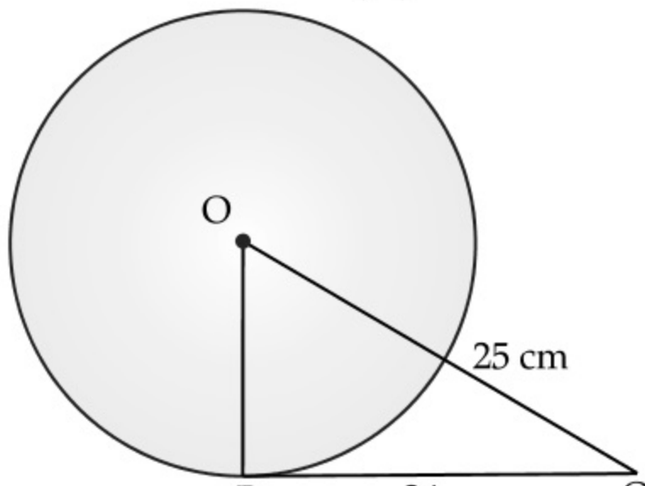
(a) $\sqrt{3}$ **(b)** $\frac{1}{\sqrt{3}}$

(c) $\frac{\sqrt{3}}{2}$ **(d)** 1 **1**

5. From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. The radius of the circle is :

(a) 7 cm **(b)** 12 cm

(c) 15 cm **(d)** 24.5 cm



1

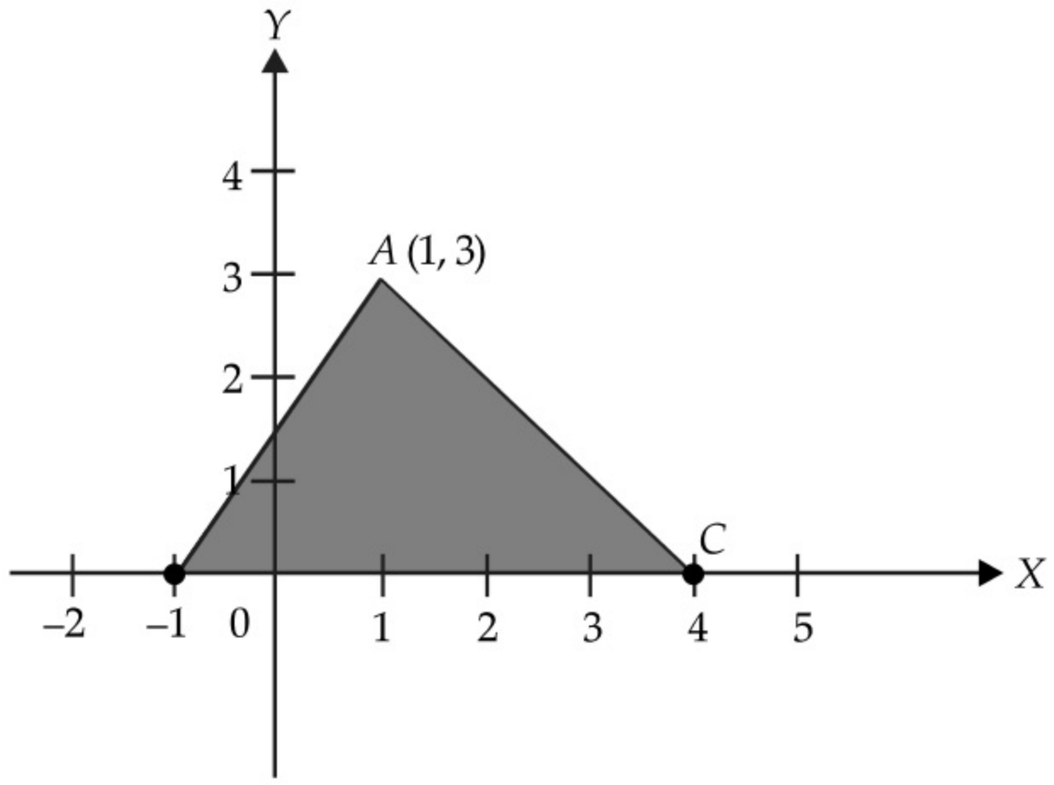
OR

If in triangles ABC and DEF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar, when :

(a) $\angle B = \angle E$ **(b)** $\angle A = \angle D$

(c) $\angle B = \angle D$ **(d)** $\angle A = \angle F$

6. In fig., find the area of triangle ABC (in sq.units) ?



(a) 15 **(b)** 10

(c) 7.5 **(d)** 2.5 **1**

7. The famous mathematician associated with finding the sum of the first 100 natural numbers is :

(a) Pythagoras **(b)** Newton

(c) Gauss **(d)** Euclid **1**

OR

AI In an A.P., if $a = 1$, $a_n = 20$ and $S_n = 399$, then n is :

(a) 19 **(b)** 21

(c) 38 **(d)** 42

8. The quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$ has

(a) two distinct real roots **(b)** two equal real roots

(c) no real roots **(d)** more than 2 real roots **1**

9. Graphically, the pair of equations

$6x - 3y + 10 = 0$

$2x - y + 9 = 0$

represents two lines which are

(a) intersecting at exactly one point **(b)** intersecting at exactly two points

(c) coincident **(d)** parallel **1**

10. $n^2 - 1$ is divisible by 8, if n is :

(a) an integer. **(b)** a natural number.

(c) an odd integer. **(d)** an even integer. **1**

Question numbers 11 to 20 carry 1 mark each

11. If two positive integers p and q can be expressed as $p = ab^2$ and $q = a^3b$; a, b being prime numbers, Find LCM of (p, q) : **1**

12. Find a quadratic polynomial, whose zeroes are –3 and 4. **1**

13. Two lines are given to be parallel. The equation of one of the lines is $4x + 3y = 14$, then find the equation of a second line. **1**

14. Three solid metallic spherical balls of radii 3 cm, 4 cm and 5 cm are melted into a single spherical ball, find its radius. **1**

15. The diameter of a wheel is 1.26 m. What the distance covered in 500 revolutions ? **1**

16. Find the value of $\frac{\sin 25^\circ}{\cos 65^\circ} + \frac{\tan 23^\circ}{\cot 67^\circ}$. **1**

17. Which of the following equations has the sum of its roots as 3?

(a) $2x^2 - 3x + 6 = 0$ **(b)** $-x^3 + 3x - 3 = 0$

(c) $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + 1 = 0$ **(d)** $3x^2 - 3x + 3 = 0$ **1**

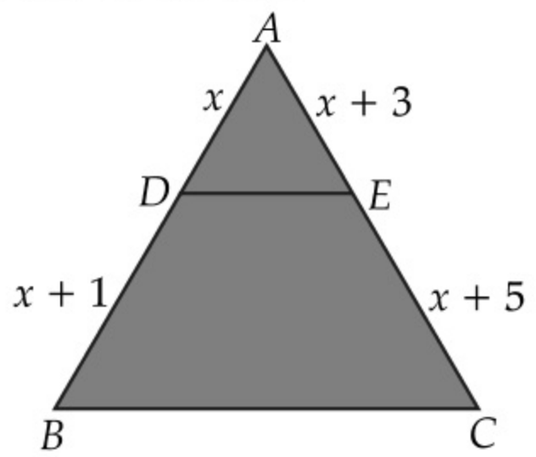
18. Two *A.P*s. have the same common difference. The first term of one of these is –1 and that of the other is – 8. Then the difference between their 4^{th} terms is :

(a) –1 **(b)** –8

(c) 7 **(d)** –9 **1**

19. The ordinate of a point A on y-axis is 5 and B has co-ordinates (– 3, 1). Find the length of AB. **1**

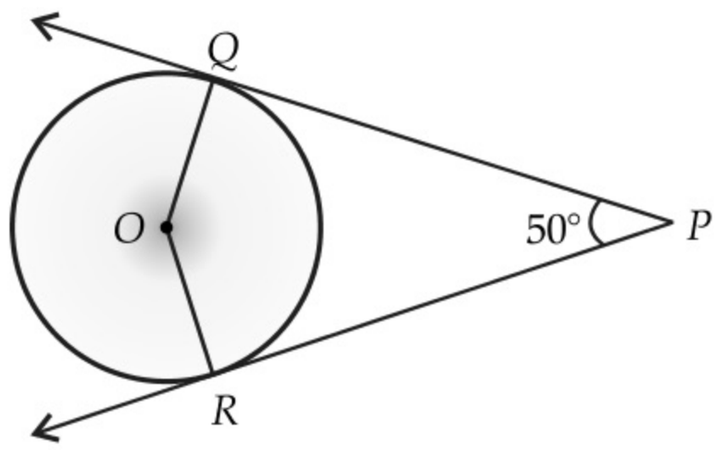
AI **20.** In ΔABC, $DE \parallel BC$, find the value of x.



1

OR

In the given figure, PQ and PR are tangents to the circle with centre O such that $\angle QPR = 50°$, then find $\angle OQR$.



Section 'B'

Question numbers 21 to 26 carry 2 marks each

21. Find the value of k, if –1 is a zero of the polynomial $p(x) = kx^2 - 4x + k$. **2**

OR

The incomes of two persons A and B are in the ratio 8 : 7 and the ratio of their expenditures is 19 : 16 If their savings are ₹ 2550 per month, find their monthly income.

22. Find the roots of the following quadratic equation :

$15x^2 - 10\sqrt{6}\,x + 10 = 0$ **2**

23. Find how many integers between 200 and 500 are divisible by 8. **2**

24. Prove that the point (3, 0), (6, 4) and (–1, 3) are the vertices of a right angled isosceles triangle. **2**

AI **25.** Prove that : $\sqrt{\dfrac{1-\cos A}{1+\cos A}} = \text{cosec } A - \cot A$ **2**

26. **(i)** Find the mean of children per family from the data given blow :

Number of children	0	1	2	3	4	5
Number of families	5	11	25	12	5	2

(ii) Which mathematical concept is used in this problem ? **2**

OR

A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball from the bag is thrice that of the red ball, find the number of blue balls in the bag.

Section 'C'

Question numbers 27 to 34 carry 3 marks each

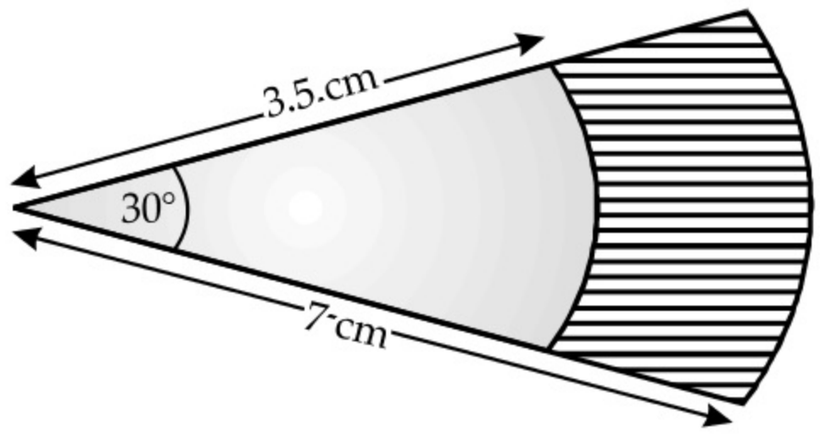
27. In a single throw of a pair of different dice, what is the probability of getting (i) a prime number on each dice ? (ii) a total of 9 or 11 ? **3**

28. The mean of the following distribution is 31.4. Determine the missing frequency x.

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency	5	x	10	12	7	8

3

29. In fig., sectors of two concentric circles of radii 7 cm and 3.5 cm are given. Find the area of shaded region. $\left(\text{Use } \pi = \frac{22}{7}\right)$



3

OR

A Solid sphere of radius 3 cm is melted and then recast into small spherical balls each of diameter 0.6 cm. Find the number of balls.

30. Show that :

$\text{cosec}^2\,\theta - \tan^2\,(90° - \theta) = \sin^2\theta + \sin^2\,(90° - \theta)$ **3**

31. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that

$$\angle PTO = 2\angle OPQ$$ **3**

OR

AI The perpendicular AD on the base BC of a ΔABC intersects BC at D so that $DB = 3CD$. Prove that $2(AB)^2 = 2(AC)^2 + BC^2$.

32. The co-ordinates of vertices of ΔABC are $A(1, -1)$, $B(-4, 6)$ and $C(-3, -5)$. Draw the figure and prove that ΔABC a scalene triangle. Find its area also. **3**

33. Find the sum of first seventeen terms of A.P. whose 4^{th} and 9^{th} terms are –15 and –30 respectively. **3**

OR

Solve for x :

$$\frac{x+1}{x-1} + \frac{x-2}{x+2} = 4 - \frac{2x+3}{x-2}; \text{ where } x \neq 1, -2, 2$$

34. Find the *HCF* of 180, 252 and 324 by Euclid's Division algorithm. **3**

Section 'D'

Question numbers 35 to 40 carry 4 marks each

35. Draw the graphs of the pair of linear equations : $x + 2y = 5$ and $2x - 3y = -4$.

Also, find the points where the lines meet the x-axis. **4**

OR

Sum of the areas of two squares is 400 cm^2. If the difference of their perimeters is 16 cm, find the sides of the two squares.

36. An A.P. consists of 37 terms. The sum of the three middle most terms is 225 and the sum of the last three terms is 429. Find the A.P. **4**

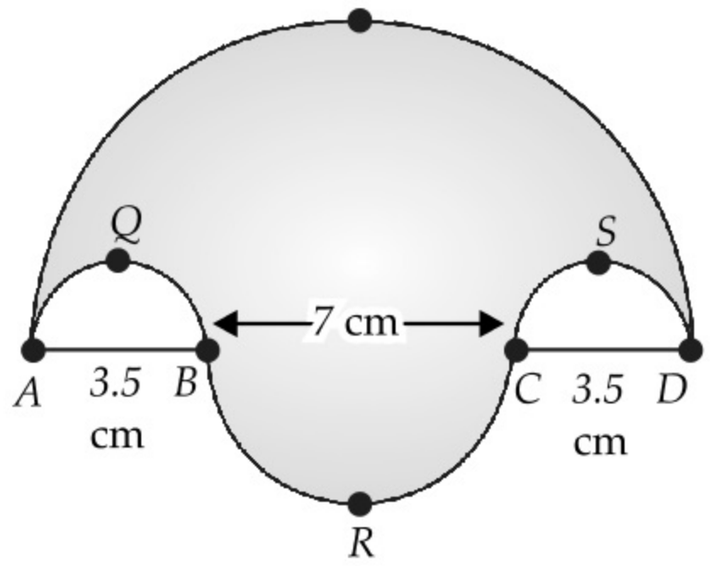
37. Draw a circle of radius 4 cm. Draw two tangents to the circle inclined at an angle of 60° to each other. **4**

38. The angle of depression of two ships from an aeroplane flying at the height of 7500 m are 30° and 45°. If both the ships are in the same line that one ship is exactly behind the other, find the side such distance between the ships. **4**

OR

The angle of elevation of the top Q of a vertical tower PQ from a point X on the ground is 60°. From a point y 40 m vertically above X, the angle of elevation of the top Q of tower is 45°. Find the height of the tower PQ and the distance PX. (Use $\sqrt{3} = 1.73$)

39. Find the area of the shaded region in figure, $\overset{\frown}{APD}$, $\overset{\frown}{AQB}$, $\overset{\frown}{BRC}$ and $\overset{\frown}{CSD}$, are semi-circles of diameter 14 cm, 3.5 cm, 7 cm and 3.5 cm respectively. $\left(\text{Use } \pi = \frac{22}{7}\right)$.



4

OR

The internal and external diameters of a hollow hemispherical vessel are 16 cm and 12 cm respectively. If the cost of painting 1 cm^2 of the surface area is ₹ 5.00, find the total cost of painting the vessel all over. (Use $\pi = 3{\cdot}14$)

40. In annual day of a school, age-wise participation of students is shown in the following frequency distribution :

Age of student (in years)	5 – 7	7 – 9	9 – 11	11 – 13	13–15	15–17	17–19
Number of students	20	18	22	25	20	15	10

Draw a 'less than type' ogive for the above data and from it find the median age. **4**

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