



**EDUDEVS**  
Upskilling Education

**CLASS - X**  
**MATHEMATICS - STANDARD**  
**SET B**

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## Section A

Section A consists of 20 questions of 1 mark each.

1. Two APs 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 4th terms is

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

2. For the following distribution:

Marks	Number of students
Below 10	3
Below 20	12
Below 30	27
Below 40	57
Below 50	75
Below 60	30

The modal class is

- (a) 10-20 (b) 20-30  
(c) 30-40 (d) 50-60

3. If one zero of the polynomial  $(3x^2 + 8x + k)$  and that of the other is the reciprocal of the other, then value of k is

- (a) 3 (b) -3  
(c)  $\frac{1}{3}$  (d)  $-\frac{1}{3}$

4.  $(x^2 + 1)^2 - x^2 = 0$  has

- (a) four real roots (b) two real roots  
(c) no real roots (d) one real root



11. The top of two poles of height 20 m and 14 m are connected by a wire. If the wire makes an angle of  $30^\circ$  with the horizontal, then the length of the wire is

- (a) 12 m    (b) 10 m    (c) 8 m    (d) 6 m

12. Which term of an AP, 21, 42, 63, 84, ... is 210?

- (a) 9th    (b) 10th    (c) 11th    (d) 12th

13. The perimeters of two similar triangles  $\triangle ABC$  and  $\triangle PQR$  are 35 cm and 45 cm respectively, then the ratio of the areas of the two triangles is .....

- (a)  $\frac{2}{9}$     (b)  $\frac{7}{9}$     (c)  $\frac{49}{81}$     (d)  $\frac{3}{4}$

14. 
$$\frac{\tan^2\theta}{1 + \tan^2\theta} + \frac{\cot^2\theta}{1 + \cot^2\theta} = ?$$

- (a) 1    (b)  $2\tan^2\theta$     (c)  $2\cot^2\theta$     (d)  $2\sec^2\theta$

15. It is proposed to build a single circular park equal in area to the sum of areas of two circular parks of diameters m 16 and m 12 in a locality. The radius of the new park would be

- (a) 10m    (b) 15m    (c) 20m    (d) 24m

16. If two solid hemispheres of same base radius  $r$  are joined together along their bases, then curved surface area of this new solid is

- (a)  $4\pi r^2$     (b)  $6\pi r^2$     (c)  $3\pi r^2$     (d)  $8\pi r^2$

17. If zeroes of the polynomial  $x^2 + 4x + 2a$  are  $a$  and  $\frac{2}{a}$ , then the value of  $a$  is

- (a) 1    (b) 2    (c) 3    (d) 4

18. If radii of two concentric circles are cm 4 and 5cm, then the length of each of one circle which is tangent to the other circle, is

- (a) 3 cm    (b) 6 cm    (c) 9 cm    (d) cm

In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correction option.

19. Assertion : Pair of linear equations :  $9x + 3y + 12 = 0$  ,  $8x + 6y + 24 = 0$  have infinitely many solutions.

Reason : Pair of linear equations  $a_1x + b_1y + c_1 = 0$  and  $a_2x + b_2y + c_2 = 0$

have infinitely many solutions, if

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$$

- (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 but 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. Assertion : If nth term of an AP is  $n^2 - 4n$ , then its common differences is -4.

Reason : Common difference of an AP is given by  $d = a_{n+1} - a_n$ .

- (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 but 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 consists of 5 questions of 2 marks each.

21. If two positive integers  $p$  and  $q$  are written as  $p = a^2 b^3$  and  $q = a^3 b$  where  $a$  and  $b$  are prime numbers then verify  $\text{LCM}(p,q) \times \text{HCF}(p,q) = pq$

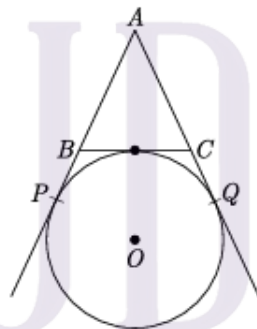
22. If the  $n$ th term of an AP  $-1, 4, 9, 14, \dots$  is 129. Find the value of  $n$ .

or

Write the  $n$ th term of the AP  $\frac{1}{m}, \frac{1+m}{m}, \frac{1+2m}{m}, \dots$

23. If the mid-point of the line segment joining the points  $A(3, 4)$  and  $B(K, 6)$  is  $P(x, y)$  and  $x + y - 10 = 0$ , find the value of  $k$ .

24. In figure,  $AP, AQ$  and  $BC$  are tangents of the circle with centre  $O$ . If  $AB = 5$  cm,  $AC = 6$  cm and  $BC = 4$  cm, then what is the length of  $AP$ ?



or

Two chords  $AB$  and  $CD$  of a circle intersect at  $E$  such that  $AE = 2.4$  cm,  $BE = 3.2$  cm and  $CE = 1.6$  cm. What is the length of  $DE$ ?

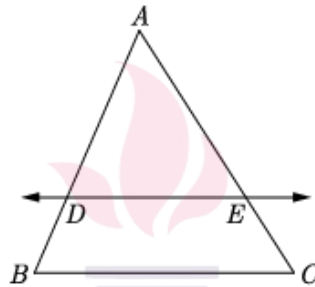
25. Two coins are tossed together. Find the probability of getting both heads or both tails.

## SECTION-C

Section C consists of 6 questions of 3 marks each.

26. Find HCF and LCM of 378, 180 and 420 by prime factorization method. Is  $\text{HCF} \times \text{LCM}$  of these numbers equal to the product of the given three numbers?

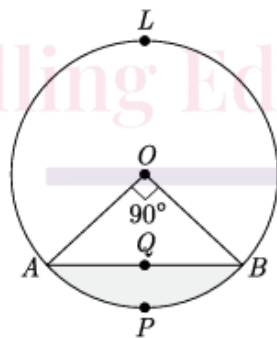
27. In Figure, in  $\triangle ABC$ ,  $DE \parallel BC$  such that  $AD = 2.4\text{ cm}$ ,  $AB = 3.2\text{ cm}$  and  $AC = 8\text{ cm}$ , then what is the length of  $AE$ ?



28. Prove that : 
$$\frac{\cot \theta + \operatorname{cosec} \theta - 1}{\cot \theta - \operatorname{cosec} \theta + 1} = \frac{1 + \cot \theta}{\sin \theta}$$

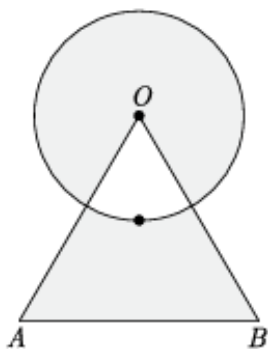
29. From a point P, which is at a distance of 13 cm from the centre O of a circle of radius 5 cm, the pair of tangents PQ and PR are drawn to the circle, then the area of the quadrilateral PQOR (in  $\text{cm}^2$ ).

30. In the given figure, a chord AB of the circle with centre O and radius 10 cm, that subtends a right angle at the centre of the circle. Find the area of the minor segment AQB. Hence find the area of major segment ALBQA. (Use  $\pi = 3.14$ )



OR

Find the area of shaded region shown in the given figure where a circular arc of radius 6 cm has been drawn with vertex O of an equilateral triangle OAB of side 12 cm as centre.



31. A die is thrown on

getting a number which

(i) is a prime number

(ii) lies between 2 and 6.

or

A die is thrown twice. Find the probability that

(i) 5 will come up at least once.

(ii) 5 will not come up either time.

#### SECTION-D

Section D consists of 4 questions of 5 marks each.

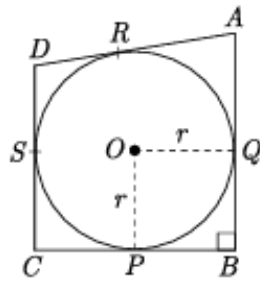
32. Find the values of  $k$  for which the equation  $(3K + 1)x^2 + 2(K + 1)x + 1$  has equal roots. Also find the roots.

or

A person on tour has Rs. 4200 for his expenses. If he extends his tour for 3 days, he has to cut down his daily expenses by Rs. 70. Find the original duration of the tour.

33. Prove that the point  $(3,0)$ ,  $(6,4)$  and  $(-1, 3)$  are the vertices of a right angled isosceles triangle.

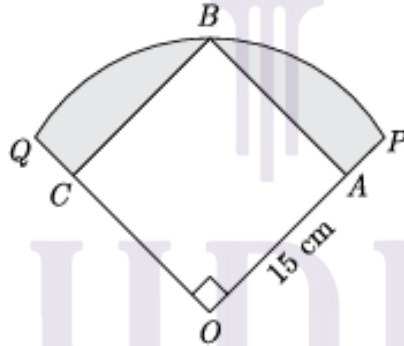
34. In figure, a circle with centre  $O$  is inscribed in a quadrilateral  $ABCD$  such that, it touches the sides  $BC$ ,  $AB$ ,  $AD$  and  $CD$  at points  $P$ ,  $Q$ ,  $R$  and  $S$  respectively. If  $AB = 29$  cm,  $AD = 23$  cm,  $\angle B = 90^\circ$  and  $DS = 5$  cm, then find the radius of the circle (in cm).



or

Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

35. In Figure, a square OABC is inscribed in a quadrant OPBQ. If  $OA = 15$  cm, find the area of the shaded region.



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