

RAM BARN 02 BEFORE EXAM

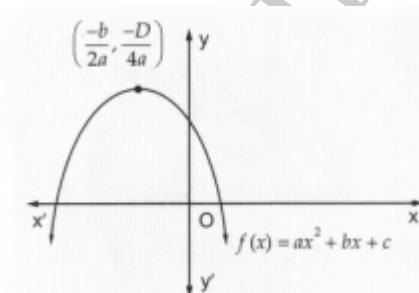
Class 10 - Mathematics

Section A

- If 3 is the least prime factor of number 'a' and 7 is the least prime factor of number 'b', then the least prime factor of $a + b$, is
 - 3
 - 10
 - 5
 - 2
- If the HCF of 65 and 117 is expressible in the form $65m - 117$, then the value of 'm' is
 - 3
 - 1
 - 2
 - 4
- The difference of a rational and an irrational number is always
 - a rational number
 - an irrational number
 - an integer
 - None of these

Section B

- If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and -3, then
 - $a = 0, b = -6$
 - $a = 5, b = -1$
 - $a = -7, b = -1$
 - $a = 2, b = -6$
- If α and β are the zeroes of the polynomial $x^2 - 6x + 8$, then the value of $\alpha^3 + \beta^3$ is
 - 76
 - 72
 - 74
 - 80
- If the diagram in Fig. shows the graph of the polynomial $f(x) = ax^2 + bx + c$, then



- $a < 0, b < 0$ and $c < 0$
 - $a < 0, b > 0$ and $c > 0$
 - $a < 0, b < 0$ and $c > 0$
 - $a < 0, b > 0$ and $c < 0$
- The sum and the product of the zeros of a quadratic polynomial are 3 and -10 respectively. The quadratic polynomial is
 -
 -

$$x^2 - 3x + 10$$

$$x^2 - 3x - 10$$

c) $x^2 + 3x - 10$

d) $x^2 + 3x + 10$

8. Which of the following is a polynomial?

i. $x^2 - 5x + 4\sqrt{x} + 3$

ii. $x^{3/2} - x + x^{1/2} + 1$

iii. $\sqrt{x} + \frac{1}{\sqrt{x}}$

iv. $\sqrt{2x^2} - 3\sqrt{3x} + \sqrt{6}$

a) Option (iv)

b) Option (ii)

c) Option (i)

d) Option (iii)

Section C

9. If $2x - 3y = 7$ and $(a + b)x - (a + b - 3)y = 4a + b$ represent coincident lines, then a and b satisfy the equation

a) $a - 5b = 0$

b) $5a - b = 0$

c) $a + 5b = 0$

d) $5a + b = 0$

10. Graphically, the pair of equations $6x - 3y + 10 = 0$, $2x - y + 9 = 0$ represents two lines which are

a) parallel

b) Intersect at two points

c) coincident

d) intersect at a point

11. The area of the triangle formed by $y = x$, $x = 6$ and $y = 0$ is

a) 18 sq. units

b) 72 sq. units

c) 36 sq. units

d) 9 sq. units

12. If $2^{x+y} = 2^{x-y} = \sqrt{8}$ then the value of y is

a) none of these

b) 0

c) $\frac{3}{2}$

d) $\frac{1}{2}$

13. The solution of $px + qy = p - q$ and $qx - py = p + q$ is

a) $x = -1$ and $y = 1$

b) $x = 1$ and $y = 1$

c) $x = 0$ and $y = 0$

d) $x = 1$ and $y = -1$

Section D

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

a) two real roots

b) no real roots

c) one real root.

d) four real roots

15. If p and q are the roots of the equation $x^2 + px + q = 0$, then

a) $p = 1$, $q = -2$

b) $p = -2$, $q = 1$

c) $b = 0$, $q = 1$

d) $p = -2$, $q = 0$

16. The sum S of first n even natural numbers is given by the relation $S = n(n + 1)$. If the sum is 420, then the value of n is

a) 20

b) 21

c) 24

d) 22

17. If I had walked 1 km per hour faster, I would have taken 10 minutes less to walk 2 km. Then the rate of my walking is

- a) 8 km/hr
- b) 6 km /hr
- c) 3 km/hr
- d) 4 km/hr

18. If a and b can take values 1, 2, 3, 4. Then the number of the equations of the form $ax^2 + bx + 1 = 0$ having real roots is

- a) 12
- b) 7
- c) 10
- d) 6

Section E

19. If $a_1 = 4$ and $a_n = 4a_{n-1} + 3$, $n > 1$, then the value of a_4 is

- a) 320
- b) 329
- c) 319
- d) 300

20. If a, b and c are in A. P., then the value of $\frac{a-b}{b-c}$ is

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

21. If 18, a, b, -3 are in A.P., then $a + b =$

- a) 7
- b) 15
- c) 19
- d) 11

22. If the sum of first n even natural numbers is equal to k times the sum of first n odd natural numbers, then $k =$

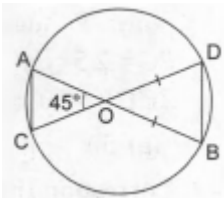
- a) $\frac{n-1}{n}$
- b) $\frac{1}{n}$
- c) $\frac{n+1}{2n}$
- d) $\frac{n+1}{n}$

23. The 9th term of an A.P. is 499 and the 499th term is 9. The term which is equal to zero is

- a) 510th term
- b) 500th term
- c) 508th term
- d) 504th term

Section F

24. In the given figure, O is the point of intersection of two chords AB and CD such that $OB = OD$ and $\angle AOC = 45^\circ$. Then, $\triangle OAC$ and $\triangle ODB$ are

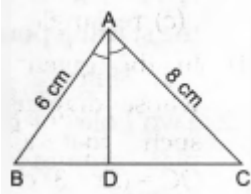


- a) equilateral and similar
- b) equilateral but not similar
- c) isosceles but not similar
- d) isosceles and similar

25. Which of the following is a true statement?

- a) Two triangles are similar if their corresponding sides are proportional.
- b) Two polygons are similar if their corresponding sides are proportional.
- c) Two similar triangles are always congruent.
- d) Two figures are similar if they have the same shape and size.

26. In a $\triangle ABC$ it is given that $AB = 6$ cm, $AC = 8$ cm and AD is the bisector of $\angle A$. Then, $BD : DC = ?$



- a) 3 : 4
 b) 9 : 16
 c) $\sqrt{3} : 2$
 d) 4 : 3

27. $\triangle ABC \sim \triangle DEF$ such that $AB = 9.1$ cm and $DE = 6.5$ cm. If the perimeter of $\triangle DEF$ is 25 cm, what is the perimeter of $\triangle ABC$?

- a) 40 cm
 b) 28 cm
 c) 35 cm
 d) 42 cm

Section G

28. If the point $P(2, 1)$ lies on the line segment joining points $A(4, 2)$ and $B(8, 4)$, then

- a) $AP = \frac{1}{4} AB$
 b) $AP = \frac{1}{2} AB$
 c) $AP = \frac{1}{3} AB$
 d) $AP = PB$

29. The ratio in which the x-axis divides the segment joining $(3, 6)$ and $(12, -3)$ is

- a) 1 : -2
 b) 2 : 1
 c) 1 : 2
 d) -2 : 1

30. AOBC is a rectangle whose three vertices are $A(0, 3)$, $O(0, 0)$ and $B(5, 0)$. The length of its diagonal is

- a) 5
 b) 3
 c) $\sqrt{34}$
 d) 4

31. If the centroid of the triangle formed by the points (a, b) , (b, c) and (c, a) is at the origin, then $a^3 + b^3 + c^3 =$

- a) $2a$
 b) 0
 c) $3abc$
 d) $a + b + c$

32. If $A = (-1, 2)$, $B = (2, -1)$ and $C = (3, 1)$ are any three vertices of a parallelogram, then find $D(a, b)$

- a) $a = -2, b = 0$
 b) $a = 2, b = 0$
 c) $a = -2, b = 6$
 d) $a = 0, b = 4$

Section H

33. If $\sin\theta + \cos\theta = \sqrt{2} \cos\theta$, then the value of $\cos\theta - \sin\theta$ is

- a) $\sqrt{2} \sin\theta$
 b) None of these
 c) $\sin\theta$
 d) $2\sin\theta$

34. If $\sin A + \sin^2 A = 1$, then the value of the expression $(\cos^2 A + \cos^4 A)$ is

- a) $\frac{1}{2}$
 b) 1
 c) 3
 d) 2

35. $\cos^4 A - \sin^4 A$ is equal to

a) $2 \sin^2 A - 1$

b) $2 \sin^2 A + 1$

c) $2 \cos^2 A + 1$

d) $2 \cos^2 A - 1$

36. The value of $\operatorname{cosec}^4 A - 2 \operatorname{cosec}^2 A + 1$ is

a) $\tan^4 A$

b) $\sec^4 A$

c) $\operatorname{cosec}^4 A$

d) $\cot^4 A$

37. If in a $\triangle ABC$, $\angle C = 90^\circ$ and $\angle B = 45^\circ$, then state which of the following is true?

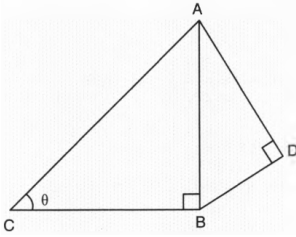
a) Perpendicular = Hypotenuse

b) Base = Hypotenuse

c) Base = Hypotenuse + Perpendicular

d) Base = Perpendicular

38. In the given figure, if $AD = 4$ cm $BD = 3$ and $CB = 12$ cm, then $\cot \theta$ is



a) $\frac{13}{12}$

b) $\frac{12}{5}$

c) $\frac{12}{13}$

d) $\frac{5}{12}$

39. If $x = r \sin \theta \cos \phi$, $y = r \sin \theta \sin \phi$ and $z = r \cos \theta$, then

a) $x^2 + y^2 + z^2 = r^2$

b) $x^2 - y^2 + z^2 = r^2$

c) $z^2 + y^2 - x^2 = r^2$

d) $x^2 + y^2 - z^2 = r^2$

Section I

40. If the elevation of the sun changes from 30° to 60° then the difference between the lengths of shadows of a pole 15 m high, is

a) $5\sqrt{3}$ m

b) 15 m

c) $10\sqrt{3}$ m

d) 7.5 m

41. If the angles of elevation of a tower from two points at distances 'm' and 'n' where $m > n$ from its foot and in the same line from it are 30° and 60° , then the height of the tower is

a) \sqrt{mn}

b) $\sqrt{m - n}$

c) $\sqrt{\frac{m}{n}}$

d) $\sqrt{m + n}$

42. From the top of a cliff 20 m high, the angle of elevation of the top of a tower is found to be equal to the angle of depression of the foot of the tower. The height of the tower is

a) 20 m

b) 40 m

c) 80 m

d) 60 m

43. If two trees of height 'x' and 'y' standing on the two ends of a road subtend angles of 30° and 60° respectively at the midpoint of the road, then the ratio of $x : y$ is

a) 1 : 3

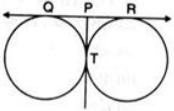
b) 1 : 2

c) 3 : 1

d) 1 : 1

Section J

44. In the given figure if $QP = 4.5$ cm, then the measure of QR is equal to



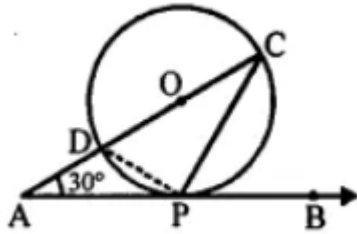
a) 15 cm

b) 9 cm

c) 18 cm

d) 13.5 cm

45. In the given figure, O is the centre of the circle. AB is the tangent to the circle at the point P . If $\angle PAO = 30^\circ$ then $\angle CPB + \angle ACP$ is equal to



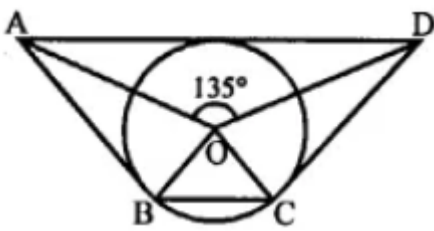
a) 120°

b) 90°

c) 150°

d) 60°

46. In the given figure, If $\angle AOD = 135^\circ$ then $\angle BOC$ is equal to



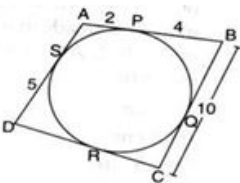
a) 45°

b) 25°

c) 52.5°

d) 62.5°

47. In the given figure, perimeter of quadrilateral $ABCD$ is



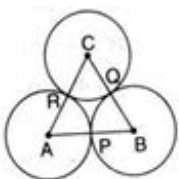
a) 34 units

b) 36 units

c) 48 units

d) 28 units

48. In the given figure, three circles with centres A, B, C respectively touch each other externally. If $AB = 6$ cm, $BC = 8$ cm and $CA = 7$ cm, then the radius of the circle with centre A is



a) 2.5 cm

b) 1.5 cm

c) 2 cm

d) 3 cm

explanation of A.

correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

68. **Assertion (A):** The roots of the quadratic equation $x^2 + 2x + 2 = 0$ are imaginary.

Reason (R): If discriminant $D = b^2 - 4ac < 0$ then the roots of quadratic equation $ax^2 + bx + c = 0$ are imaginary.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

Section P

69. **Assertion (A):** If ratio of perimeters of two similar triangles is 6 : 11, then ratio of their corresponding medians is also 6 : 11.

Reason (R): Converse of B.P.T. states that if two sides of a triangle are divided by a line in equal ratio then the line is parallel to the third side.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

70. **Assertion (A):** If in a $\triangle ABC$, a line $DE \parallel BC$, intersects AB in D and AC in E , then $\frac{AD}{AB} = \frac{AE}{AC}$

Reason (R): If a line is drawn parallel to one side of a triangle intersecting the other two sides, then the other two sides are divided in the same ratio.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

Section Q

71. **Assertion (A):** PA and PB are two tangents to a circle with centre O. Such that $\angle AOB = 110^\circ$, then $\angle APB = 90^\circ$.

Reason (R): The length of two tangents drawn from an external point are equal.

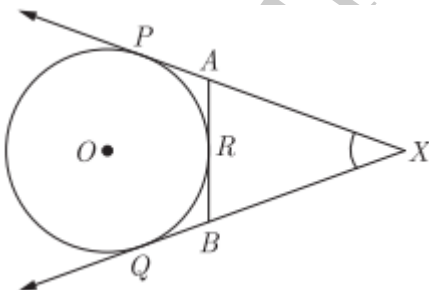
a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

72. **Assertion (A):** In the given figure, $XA + AR = XB + BR$, where XP, XQ and AB are tangents.



Reason (R): A tangent to the circle can be drawn from a point inside the circle.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

Section R

73. **Assertion (A):** If the value of mode and mean is 60 and 66 respectively, then the value of median is 64.

Reason (R): Median = (mode + 2 mean)

- a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false. d) A is false but R is true.

74. **Assertion (A):** The mean, mode and median of a grouped data wise always be same.

Reason (R): mean = $\frac{\text{sum of all observation}}{\text{number of observation}}$.

- a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false. d) A is false but R is true.

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