MATHS

BOOKS - OBJECTIVE RD SHARMA ENGLISH

CARTESIAN CO-ORDINATE SYSTEM

Illustration

1. If the point (x,y) be equidistant from the points $(a+b, b-a)$ and $(a-b, a+b)$, then

A. $ax = by$

B. $bx = ay$

C. $ax + by = 0$

D. $bx + ay = 0$

Answer: B

Watch Video Solution

2. If P and Q are two points whose coordinates are $(at^2, 2at) and \left(\frac{a}{t^2}, \frac{2a}{t}\right)$ respectively and S is the point (a,0). Show that $\frac{1}{SP} + \frac{1}{sQ}$ is independent of t.

A. a

B. 4a

C. 2a

D. $\frac{2}{a}$

Answer: C

Watch Video Solution

3. A triangle with vertices (4,0) ,(-1,-1) (3,5) is

A. isoceles and right angles

B. isoscles but not right angled

C. right angled but not isosceles

D. neither right angeld nor isosceles

Answer: A

Watch Video Solution

4. If the coordinates of midpoints of AB and $ACof\Delta$ A B C` are (3,5) and (-3,-3) respectively, then write the length of side BC.

A. 10

B. 15

C. 20

D. 30

Answer: C

Watch Video Solution

5. If the line segment joining the points $P(x_1, y_1) and\, Q(x_2, y_2)$ subtends an angle α at the origin O, prove that : $OP\dot{O}Q \cos\alpha = x_1x_2 + y_1y_2$.

A. $x_1x_2 + y_1y_2$

B. $x_1y_2 + x_2y_1$

C. $|x_1y_2 - x_2y_1|$

D. none of these

Answer: A

Watch Video Solution

6. If points $O(0, 0) A\left(3, \sqrt{3}\right)$ and $B(3, a)$ are the vertices of an equilaterla triangle then a=

A. 2

B. -3

C. -4

D. none of these

Answer: D

Watch Video Solution

7. Prove that the points $A(1, 1), B(-1, -1)$ and $C(\sqrt{3}, -\sqrt{3})$ are the vertices of an equilateral triangle.

A. right-angled

B. isoscles but not right angled

C. equilateral

D. name of these

Answer: D

Watch Video Solution

8. If O is the origin and $P(x_1, y_1), Q(x_2, y_2)$ are two points then $OPxOQ\sin\angle POQ =$

A. $x_1y_2 + x_1y_2$

B. $x_1y_2 + x_2y_1$

C. $|x_1y_2 - x_2y_1|$

D. none of these

Answer: C

Watch Video Solution

9. If the coordinates of two points A and B are (3, 4) and $(5, -2)$, respectively, find the coordinates of any point P if $PA = PB$. Area of PAB is 10 sq. units.

A. (2,7)

B. (7,2)

C. (1,0)

D. (0,1)

Answer: B

Watch Video Solution

10. Find the area of the quadrilateral whose vertices are $(-3, 2), (5, 4), (7, -6)$ and $(-5, -4)$

A. $\frac{3}{2}$ sq. unirts

B. $\frac{11}{2}$ sq. unirts

C. $\frac{1}{2}$ sq. unirts

D. none of these

Answer: B

Watch Video Solution

11. If two vertices of an equilateral triangle have integral coordinates, then the third vertex will have:

A. integral coodinates which are rtional

B. coordinates which are rational

C. at least one coordinate irrational

D. coordinates which are irrational

Answer: C

Watch Video Solution

12. If points $(a^2, 0), (0, b^2)$ and $(1, 1)$ are collinear, then

A. $\frac{1}{a^2} + \frac{1}{b^2} = 1$

B. $\frac{1}{a} + \frac{1}{b} = 1$

C. $a^2 + b^2 = 1$

D. none of these

Answer: A

Watch Video Solution

13. If the points $A(\lambda, 2\lambda), B(3\lambda, 3\lambda)$ and $C(3, 1)$ are collinear, then $\lambda =$

A. $1/3$

B. $-1/3$

C. $2/3$

D. $2/3$

Answer: B

Watch Video Solution

14. If area of the triangle formed by $(0, 0), \left(a^{x^2}, 0\right), \left(0, a^{6x}\right)$ is $\frac{1}{2a^5}$ sq. units then $x =$

A. 1,5

B. $-1, 5$

C. $1, \ -5$

D. $-1, \ -5$

Answer: D

Watch Video Solution

15. Write the area of the triangle having vertices at $(a, b + c), \ (b, c + a), \ (c, a + b)$.

A. 0

B. $a + b + c$

C. $ab + bc + ca$

D. none of these

Answer: A

Watch Video Solution

16. Let A(h, k), B(1, 1) and C(2, 1) be the vertices of a right angled triangle with AC as its hypotenuse. If the area of the triangle is 1, then the set of values which 'k' can take is given by

A. $\{1, 3\}$

B. $\{0, 2\}$

C. $\{-1, 3\}$

D. $\{-3, -2\}$

Answer: C

Watch Video Solution

17. If the point $x_1 + t(x_2 - x_1), y_1 + t(y_2 - y_1)$ divides the join of (x_1, y_1) and $(x_2, y - 2)$ internally then

A. $t < 0$

B. $0 < t < 1$

C. $t < 1$

D. $t = 1$

Answer: B

Watch Video Solution

18. If $P(1, 2)Q(4, 6), R(5, 7),$ and $S(a, b)$ are the vertices of a parallelogram $PQRS,$ then (a)$a = 2, b = 4$ (b) $a = 3, b = 4$ (c) $a = 2, b = 3$ (d) $a = 1, b = -1$

A. $a = 2, b = 4$

B. $a = 3, b = 4$

C. $a = 2, b = 4$

D. $a = 3, b = 5$

Answer: C

Watch Video Solution

19. If $(1, a), (2, b), (c^2, -3)$ are vertices of a triangle then the condition for its centroid to lie on x-axis is

A. a=3

B. b=3

C. $a + b = 3$

D. $a - b = 3$

Answer: C

Watch Video Solution

20. If the vertices of a triangle are at $O(0, 0), A(a, 0)$ and $B(0, b)$. Then, the distance between its circumcentre and orthocentre is

A. $\sqrt{a^2 + b^2}$

B. $\frac{1}{2}\sqrt{a^2 + b^2}$

C. $\sqrt{\frac{a^2 + b^2}{2}}$

D. $\frac{1}{4}\sqrt{a^2 + b^2}$

Answer: B

Watch Video Solution

21. Find the incentre of the triangle with vertices $A91, \sqrt{3}), B(0, 0)$ and $C(2, 0)$.

A. $(1, \sqrt{3}/2)$

B. $(2/3, 1, \sqrt{3})$

C. $(2/3, \sqrt{3}/2)$

D. $\left(1/1, \sqrt{3}\right)$

Answer: D

Watch Video Solution

22. If the centrroid and circumentre of a triangle are (3,3) and (6,2) respectively, then the orthocentre, is

A. (-3,5)

B. (-3,1)

C. (3,-1)

D. (9,5)

Answer: A

Watch Video Solution

23. Write the coordinates of the incentre of the triangle having its vertices at (0,0), (5,0) and (0,12).

A. (3,3)

B. (2,2)

C. (7,7)

D. (9,9)

Answer: B

Watch Video Solution

24. The circumcentre of the triangle formed by $(0, 0), (2, -1)$ and $(-1, 3)$ is $\left(\frac{5}{2}, \frac{5}{2}\right)$. Then the orthocentre is

A. (-4,-3)

B. (4,3)

C. (-4,3)

D. none of these

Answer: A

Watch Video Solution

25. Orthocentre of triangle whose vertices are $(0, 0), (3, 4), (4, 0)$ is

A. (3,5/2)

B. (3,12)

C. (3,3/4)

D. (3,9)

Answer: C

Watch Video Solution

26. At what point should the origin be shifted if the coordinates of a point $(4, 5)$ become $(-3, 9)$?

A. (-7,4)

B. (7,-4)

C. (1,14)

D. (-4,7)

Answer: B

Watch Video Solution

27. Shift the origin to a suitable point so that the equation $y^2 + 4y + 8x - 2 = 0$ will not contain a term in y and the constant term.

A. $\left(\frac{3}{4}, -2\right)$

B. $\left(-\frac{3}{4}, 2\right)$

C. $\left(2, -\frac{3}{4}\right)$

D. $\left(-2, \frac{3}{4}\right)$

Answer:

Watch Video Solution

28. The coordinates of the point where origin is shifted is (-1,2) so that the equation $2x^2 + y^2 - 4x + 4y = 0$ become?

A. $X^2 + 2Y^2 = 6$

B. $2X^2 + Y^2 = 6$

C. $2X^2 + Y^2 = 4$

D. $X^2 + 2Y^2 = 4$

Answer: B

Watch Video Solution

29. If the axes be turned through an angle $\tan^{-1} 2$ (in anticlockwise direction), what does the equatio $4xy - 3x^2 = a^2$ become ?

A. $X^2 + 4Y^2 = a^2$

B. $X^2 - 4Y^2 = 4a^2$

C. $X^2 - 4Y^2 = a^2$

D. $X^2 + 4Y^2 = 4a^2$

Answer: C

Watch Video Solution

30. If (x,y) and (X,Y) be the coordinates of the same point referred to two sets of rectangular axes with the same origin and if ax+by becomes pX+qY, where a,b are independent of x,y, then

A. $a^2 - b^2 = p^2 - q^2$

B. $a^2 + b^2 = p^2 + q^2$

C. $a^2 + p^2 = b^2 + q^2$

D. $a^2b^2 = p^2q^2$

Answer: B

Watch Video Solution

31. The angle through which the axes must be rotated, without translation, in anit-closwise sence so that the exprssion $ax^2 + hxy - by^2 + 2gx + 2fy + c$ does not contain the mixed product xy, is given by

A. $\tan^{-1}\left(\frac{2h}{a-b}\right)$

B. $\frac{1}{2}\tan^{-1}\left(\frac{2h}{b-a}\right)$

C. $\frac{1}{2}\tan^{-1}\left(\frac{2h}{a-b}\right)$

D. $\frac{1}{2}\tan^{-1}\left(\frac{h}{a-b}\right)$

Answer: C

Watch Video Solution

Section I Solved Mcqs

1. If t_1, t_2 and t_3 are distinct, the points $\left(t_1 2at_1 + at_1^3\right), \left(t_2, 2\text{at}_2 + at_2^3\right)$ and $\left(t_3, 2at_3 + at_3^3\right)$

A. $t_1 t_2 t_3 = 1$

B. $t_1 + t_2 + t_3 = t_1 t_2 t_3$

C. $t_1 + t_2 + t_3 = 0$

D. $t_1 + t_2 + t_3 = -1$

Answer: C

Watch Video Solution

2. about to only mathematics

A. centroid

B. incentre

C. circumentre

D. orthoentre

Answer: B

Watch Video Solution

3. If all the vertices of a triangle have integral coordinates, then the triangle may be (a) right-angle (b) equilateral (c) isosceles (d) none of these

A. right-angled

B. equilateral

C. isoosceles

D. none of these

Answer: B

Watch Video Solution

4. If a vertex of a triangle is (1, 1) and the mid-points of two side through this vertex are (-1, 2) and (3, 2), then centroid of the triangle is

A. $\left(\frac{1}{3}, \frac{7}{3}\right)$

B. $\left(2, \frac{7}{3}\right)$

C. $\left(-\frac{1}{3}, \frac{7}{3}\right)$

D. $\left(-1, \frac{7}{3}\right)$

Answer: B

Watch Video Solution

5. One possible condition for the three points (a,b), (b,a) and $\left(a^2, -b^2\right)$ to be collinear is

A. $a - b = 2$

B. $a + b = 2$

C. $a = 1 + b$

D. $a = 1 - b$

Answer: C

Watch Video Solution

6. Let A (a,b) be a fixed point and O be the origin of coordionates. If A_1 is the mid-point of OA, A_2 is the mid- poind of AA_1, A_3 is the mid-point of AA_2 and so on. Then the coordinates of A_n are

A. $\left(a\left(1 - 2^{-n}\right), b\left(1 - 2^{-n}\right)\right)$

B. $\left(a\left(2^{n-1} - 1\right), b\left(2^{-n} - 1\right)\right)$

C. $\left(a\left(1 - 2^{(n-1)}\right), b\left(1 - 2^{(n-1)}\right)\right)$

D. none of these

Answer: A

Watch Video Solution

7. The points $A(0, 0), B(\cos\alpha, \sin\alpha)$ and $C(\cos\beta, \sin\beta)$ are the vertices of a right angled triangle if :

A. $\frac{1}{2}$

B. $\frac{1}{\sqrt{2}}$

C. $\frac{1}{\sqrt{3}}$

D. none of these

Answer: B

Watch Video Solution

8. If O is the orthocentre of triangle ABC whose vertices are at $A\left(at_1^2, 2at_1\right), B\left(at_2^2, 2at_2\right)$ and $C\left(at_3^2, 2at_3\right)$ then the coordinates of the orthocentreof $\Delta O'BC$ are

A. $\left(a\left(t_1^2+t_2^2+t_3^2\right), 2a(t_1+t_2+t_3)\right)$

B. $(-a, 0)$

C. $\left(at_1^2, 2at_1\right)$

D. $(0, a)$

Answer: C

Watch Video Solution

9. If Δ_1 is the area of the triangle formed by the centroid and two vertices of a triangle Δ_2 is the area of the triangle formed by the mid- point of the sides of the same triangle, then $\Delta_1 : \Delta_2$=

A. $3:4$

B. $4:1$

C. $4:3$

D. $2:1$

Answer: C

Watch Video Solution

10. The number of point equidistant to three given distinct non-collinear points, is

A. 0

B. 1

C. 2

D. Infinite

Answer: B

Watch Video Solution

11. The area of the triangle formed by theorigin, the point $P(x, y)$ and its reflection in X-axis is

A. xy

B. $2|xy|$

C. $\frac{1}{2}|xy|$

D. $|xy|$

Answer: D

Watch Video Solution

12. Q,R and S are the points on line joining the points $P(a, x)$ and $T(b, y)$ such that $PQ = QR = RS = ST$ then $\left(\frac{5a + 3b}{8}, \frac{5x + 3y}{8}\right)$ is the mid point of

A. PQ

B. QR

C. RS

D. ST

Answer: B

Watch Video Solution

13. The angle through which the coordinates axes be rotated so that xy-term in the equation $5x^2 + 4\sqrt{3}xy + 9y^2 = 0$ may beb missing, is

A. $\pi/6$

B. $\pi/4$

C. $\pi/3$

D. $2\pi/3$

Answer: C

Watch Video Solution

14. If the axes are rotated through an angle of 30° in the anti clockwise direction, then coordinates of point $\left(4, -2\sqrt{3}\right)$ with respect to new

axes are

A. $(2, \sqrt{3})$

B. $(\sqrt{3}, 2)$

C. $(\sqrt{3}, -5)$

D. (2,3)

Answer: C

Watch Video Solution

15. If the axes are rotated through an angle of 45° in the clockwise direction, the coordinates of a point in the new systeme are (0,-2) then its original coordinates are

A. $(\sqrt{2}, \sqrt{2})$

B. $(-\sqrt{2}, \sqrt{2})$

C. $(\sqrt{2}, -\sqrt{2})$

D. $\left(-\sqrt{2},\ -\sqrt{2} \right)$

Answer: D

Watch Video Solution

16. To remvoe the first dgree terms in the equation $4x^2 + 9y^2 - 8x + 36y + 4 = 0$, the origin in shifted to the point

A. (1,2)

B. (1,-2)

C. (2,1)

D. (-2,1)

Answer: B

View Text Solution

17. By shifting origin to $(-1, 2)$ the equation $y^2 + 8x - 4y + 12 = 0$ changes as $Y^2 = 4aX$ then $a =$

A. 1

B. 2

C. -2

D. -1

Answer: C

Watch Video Solution

18. If $\alpha, \beta\gamma$ are the real roots of the equation $x^3 - 3px^2 + 3qx - 1 = 0$, then find the centroid of the triangle whose vertices are $\left(\alpha, \frac{1}{\alpha}\right), \left(\beta, \frac{1}{\beta}\right)$ and $\left(\gamma, \frac{1}{\gamma}\right)$.

A. (a,b)

B. (a/3,b/3)

C. (a+b,a-b)

D. (3a,3b)

Answer: A

Watch Video Solution

19. The line joining $A(b\cos\alpha, b\sin\alpha)$ and $B(a\cos\beta, a\sin\beta)$ is produced to the point $M(x, y)$ so that AM and BM are in the ratio $b: a$. Then $x\cos\left(\frac{\alpha+\beta}{2}\right)+y\sin\left(\frac{\alpha+\beta}{2}\right)$

A. (-1)

B. 0

C. 1

D. a^2+b^2

Answer: B

Watch Video Solution

20. Find the incentre of the triangle with vertices $A91, \sqrt{3}), B(0, 0)$ and $C(2, 0)$.

A. $\left(1, \frac{\sqrt{3}}{2}\right)$

B. $\left(\frac{2}{3}, \frac{1}{\sqrt{3}}\right)$

C. $\left(\frac{2}{3}, \frac{\sqrt{3}}{2}\right)$

D. $\left(1, \frac{1}{\sqrt{3}}\right)$

Answer: D

Watch Video Solution

21. If the circumcenter of an acute-angled triangle lies at the origin and the centroid is the middle point of the line joining the points $\left(a^2 + 1, a^2 + 1\right)$ and $(2a, -2a)$, then find the orthocentre.

A. $y = \left(a^2 + 1\right)x$

B. $y = 2ax$

C. $x = y = 0$

D. $(a-1)^2 x - (a+1)^2 y = 0$

Answer: D

Watch Video Solution

22. The x-coordinate of the incentre of the triangle that has the coordinates of mid points of its sides as (0, 1), (1, 1) and (1, 0) is

A. $2 + \sqrt{2}$

B. $1 + \sqrt{2}$

C. $2 - \sqrt{2}$

D. $1 - \sqrt{2}$

Answer: C

Watch Video Solution

23. OPQR is a square and M,N are the middle points of the sides of PQ nad QR, respectively,then the ratio of the area of the square to that of triangle OMN is

A. $4:1$

B. $2:1$

C. $8:3$

D. $4:3$

Answer: C

Watch Video Solution

24. Let $O(0,0), P(3,4),$ and $Q(6,0)$ be the vertices of triangle OPQ . The point R inside the triangle OPQ is such that the triangles OPR, PQR, OQR are of equal area. The coordinates of R are a. $\left(\frac{4}{3}, 3\right)$ b. $\left(3, \frac{2}{3}\right)$ c. $\left(3, \frac{4}{3}\right)$ d. $\left(\frac{4}{3}, \frac{2}{3}\right)$

A. (4/3,3)

B. (3,2/3)

C. (3,4/3)

D. (4/3,2/3)

Answer: C

Watch Video Solution

25. Consider three points $P = (-\sin(\beta-\alpha), -\cos\beta)$, $Q = (\cos(\beta-\alpha), \sin\beta)$, and $R = ((\cos(\beta-\alpha+\theta), \sin(\beta-\theta))$, where $0 < \alpha, \beta, \theta < \frac{\pi}{4}$ Then

A. P lies on the line segmennt RQ

B. Q lies on the line segmet PR

C. R lies on the line segment QP

D. P,Q,R are non-colinear

Answer: D

Watch Video Solution

26. A triangle are$(6, 0). (0, 6)$ and $(6, 6)$. If distance between circumcentre and orthocenter and distance between circumcentre and centroid are $\lambda$and u unit respectively, then (λ, u) lies on:

A. $2\sqrt{2}$

B. 2

C. $3\sqrt{3}$

D. 1

Answer: C

Watch Video Solution

27. The x-coordinate of the incentre of the triangle that has the coordinates of mid points of its sides as (0, 1), (1, 1) and (1, 0) is

A. $2+\sqrt{2}$

B. $2-\sqrt{2}$

C. $1+\sqrt{2}$

D. $1-\sqrt{2}$

Answer: B

Watch Video Solution

28. Let $A(5, 12), B(-13\cos\theta, 13\sin\theta)$ and $C(13\sin\theta, -13\cos\theta)$ are angular points of ABC where $\theta \in R$. The locus of orthocentre of DeltaABC is

A. x-y=7

B. x-y+7=0

C. x+y-7=0

D. x+y+7=0

Answer: A

Watch Video Solution

29. Let k be an integer such that the triangle with vertices $(k, -3k), (5, k)$ and $(-k, 2)$ has area $28 sq.$ units. Then the orthocentre of this triangle is at the point : (1) $\left(1, -\frac{3}{4}\right)$ (2) $\left(2, \frac{1}{2}\right)$ (3) $\left(2, -\frac{1}{2}\right)$ (4) $\left(1, \frac{3}{4}\right)$

A. (2,-1/2)

B. (1,3/4)

C. (1,-3/4)

D. (2,1/2)

Answer: D

Watch Video Solution

Section Ii Assertion Reason Type

1. Statement-1 : The points a(3,4), B(2,7) ,C(4,4) dn D(3,5) are such that are of them lies inside the triangle formed by other the points

Statement-2 : Centroid of a triangle always lies inside the triangle

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2 is True, Statement-2 not a correct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True

Answer: A

Watch Video Solution

2. Statement-1: The orthocentre of the triangle having its verticews at A(2,0), B(4,0) and C(4,6) is at the point o(4,0)

Statement-2 : Orthocentre of a right triangle is at the vertex forming a right angle

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2 is True, Statement-2 not a correct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True

Answer: A

Watch Video Solution

3. Statement-1: Let x_1, x_2, x_3, y_1, y_2 and y_3 be integers and $A(x_1, y_1), B(x_2, y_2)$ and $C(x_3, y_3)$ be three non-collinear points. Then ΔABC is not equilateral.

Statement-2: Area of an equlateral trinalge is $\frac{\sqrt{3}}{4}(\text{Side})^2$

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2 is True, Statement-2 not a correct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True

Answer: A

Watch Video Solution

4. Statement-1: If the circumcentre of a triangle lies at origin and centroid is the middle point of the line joining the points (2,3) and (4,7), then its orthocentre satisfies the relation $5x - 3y = 0$

Statement-2: The circumcentre, centroid and the orthocentre of a triangle is on the same line and centroid divides the lines segment joining circumcentre in the ratio $1:2$

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2 is True, Statement-2 not a correct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True

Answer: A

Watch Video Solution

5. Statement-1 : The points A(-2,2), B(2,-2) and C(1,1) are the vertices of an obtuse angled isoscles triangle.

Statement-2: Every obtuse angle triangle is isosceles.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2 is True, Statement-2 not a correct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True

Answer: C

Watch Video Solution

6. Statement-1: The quadrilateral whose vertices (in order) are A(1,0), B(0,3) , C(-2,0) and D(0,2) cannot be convex.

Statement-2: A quadrilateral ABCD (in order is) is convex if when any

diagonal is taken then the remaining vertices must be on the opposite sides of it.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2 is True, Statement-2 not a correct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True

Answer: A

Watch Video Solution

Exercise

1. If the vertices of a triangle are at $O(0, 0), A(a, 0)$ and $B(0, a)$. Then, the distance between its circumcentre and orthocentre is

A. $\frac{a}{2}$

B. $\frac{a}{\sqrt{2}}$

C. $\sqrt{2}a$

D. $\frac{a}{4}$

Answer: B

Watch Video Solution

2. The angles A, B and C of a ΔABC are in A.P. If $AB = 6$, $BC = 7$,then $AC =$

A. 5

B. 7

C. 8

D. none of these

Answer: D

Watch Video Solution

3. If the distance between the points $P(a\cos 48^\circ, 0)$ and $Q(0, a\cos 12^\circ)$ is d, then $d^2 - a^2 =$

A. $\frac{a^2}{4}(\sqrt{5}-1)$

B. $\frac{a^2}{4}(\sqrt{5}+1)$

C. $\frac{a^2}{8}(\sqrt{5}-1)$

D. $\frac{a^2}{8}(\sqrt{5}+1)$

Answer: D

Watch Video Solution

4. If the centroid of the triangle formed by the points (a, b), (b, c) and (c, a) is at the origin, then $a^3 + b^3 + c^3 = abc$ (b) 0 (c) $a + b + c$ (d) $3abc$

A. 0

B. abc

C. 3abc

D. $-3abc$

Answer: C

Watch Video Solution

5. Write the coordinates of the orthocentre of the triangle formed by points (8,0), (4,6) and (0,0)

A. (0,0)

B. (8,0)

C. (4,6)

D. none of these

Answer: A

Watch Video Solution

6. If O is the origin P(2,3) and Q(4,5) are two, points, then $OP \cdot OQ \cos \angle POQ =$

A. 8

B. 15

C. 22

D. 23

Answer: D

Watch Video Solution

7. If O is the origin and $P(x_1, y_1), Q(x_2, y_2)$ are two points then $OPxOQ \sin \angle POQ =$

A. $x_1x_2 + y_1 + y_2$

B. $x_1y_2 + x_2 + y_1$

C. $|x_1y_2 - x_2y_1|$

D. none of these

Answer: C

Watch Video Solution

8. If P(3,7) is a point on the line joining A(1,1) and B(6,16), then the harmonic conjugate Q of point P has the coordinates

A. (9,29)

B. (-9,29)

C. (9,-29)

D. (-9,-29)

Answer: D

Watch Video Solution

9. The coordinates of the centrid of a triangle having its circumcentre and orthocenrtre at (7/2,5/2) and (2,1) respectively, are

A. (3,2)

B. (13/6,3/2)

C. (5/2,3/2)

D. (3/2,5/2)

Answer: A

Watch Video Solution

10. The mid-point of the sides of a ΔABC are D(6,1) ,E(3,5) and F(-1,-2) then the coordinates of the vertex opposite to D are

A. (-4,2)

B. (-4,5)

C. (2,5)

D. (10,5)

Answer: A

Watch Video Solution

11. If the coordinates of orthocentre O' are centroid G of a ΔABC are (0,1) and (2,3) respectively, then the coordinates of the circumcentre are

A. (3,2)

B. (1,0)

C. (4,3)

D. (3,4)

Answer: D

Watch Video Solution

12. The ratio in which the y-axis divides the line segement joining $(4, 6), (2, -3)$ is

A. $2:1$

B. $1:2$

C. $3:4$

D. none of these

Answer: A

Watch Video Solution

13. If C and D are the points of internal and external division of line segment AB in the same ratio, then AC,AB, AD are in

A. AP

B. GP

C. HP

D. AGP

Answer: C

Watch Video Solution

14. If the centroid of a triangle is $(1, 4)$ and two of its vertices are $(4, -3)$ and $(-9, 7)$, then the area of the triangle is 183 sq. units (b) $\frac{183}{2}$ sq. units (c) 366 sq. units (d) $\frac{183}{4}$ sq. units

A. $\frac{138}{2}$

B. $\frac{319}{2}$

C. $\frac{183}{2}$

D. $\frac{381}{2}$

Answer: V

Watch Video Solution

15. A triangle with vertices $(4, 0), (-1, -1), (3, 5)$, is

A. isosceles and right angled

B. isoscles but not right angled

C. right angled but not isosceles

D. neither right angeld nor isosceles

Answer: A

Watch Video Solution

16. The angle through which the coordinates axes be rotated so that xy-term in the equation $5x^2 + 4\sqrt{3}xy + 9y^2 = 0$ may beb missing, is

A. $\pi/6$

B. $\pi/4$

C. $\pi/3$

D. $\pi/2$

Answer: V

Watch Video Solution

17. In order to make the first degree terms missing in the equation $2x^2 + 7y^2 + 8x - 14y + 15 = 0$, the origin should be shifted to the point

A. (-2,1)

B. (1,2)

C. (2,1)

D. (1,-2)

Answer: A

Watch Video Solution

18. When the origin is shifted to a suitable point, the equation $2x^2 + y^2 - 4x + 4y = 0$ transformed as 2x^2+y^2-8x +8y+ 18=0`. The point to which origin was shifted is

A. (1,2)

B. (1,-2)

C. (-1,2)

D. (-1,-2)

Answer: D

Watch Video Solution

19. If by shifting the origin at (1,1) the coordinates of a point P become $(\cos\theta, \cos\phi)$ then the original coordinates of P were

A. $\left(2\cos^2\theta/2, 2\cos^2\phi/2\right)$

B. $\left(2\sin^2\theta/2, 2\sin^2\phi/2\right)$

C. $(2\cos\theta/2, 2\cos\phi/2)$

D. $(2\sin\theta/2, 2\sin\phi/2)$

Answer: A

Watch Video Solution

20. By rotating the coordinates axes through 30° in anticlockwise sense the eqution $x^2 + 2\sqrt{3}xy - y^2 = 2a^2$ change to

A. $X^2 - Y^2 = 3a^2$

B. $X^2 - Y^2 = a^2$

C. $X^2 - Y^2 = 2a^2$

D. none of these

Answer: B

Watch Video Solution

21. In ΔABC, the sides $BC = 5, CA = 4$ and $AB = 3$. If $A \equiv (0, 0)$ and the internal bisector of angle A meets BC in $D\left(\frac{12}{7}, \frac{12}{7}\right)$ then incentre of ΔABC is.

A. (2,2)

B. (2,3)

C. (3,2)

D. (1,1)

Answer: D

Watch Video Solution

22. The harmonic conjugate of (4,-2) with respect to (2,-4) and (7,1) is

A. (-8,-14)

B. (2,3)

C. (-2,-3)

D. (1,1)

Answer: A

Watch Video Solution

23. If the coordinates of the centroid and a vertex oc an equilaterqal triangle are (1,1) and (1,2) respectively, then the coordinates of another vertex, are

A. $\left(\frac{2-\sqrt{3}}{2}, -\frac{1}{2}\right)$

B. $\left(\frac{2+3\sqrt{3}}{2}, -\frac{1}{2}\right)$

C. $\left(\frac{2+\sqrt{3}}{2}, -\frac{1}{2}\right)$

D. none of these

Answer: C

Watch Video Solution

24. The transformed equation of $3x^2 + 3y^2 + 2xy - 2 = 0$ when the coordinats axes are rotated through an angle of 45°, is

A. $X^2 + 2Y^2 = 1$

B. $2X^2 + Y^2 = 1$

C. $X^2 + Y^2 = 1$

D. $X^2 + 3Y^2 = 1$

Answer: B

Watch Video Solution

25. The transformed equation of $x^2 + 6xy + 8y^2 = 10$ when the axes are rotated through an angled $\pi/4$ is

A. $15x^2 - 14xy + 3y^2 = 20$

B. $15x^2 + 14xy - 3y^2 = 20$

C. $15x^2 + 14xy + 3y^2 = 20$

D. $15x^2 - 14xy - 3y^2 = 20$

Answer: C

Watch Video Solution

26. Let $0 \leq \theta \leq \frac{\pi}{2}$ and $x = X\cos\theta + Y\sin\theta, y = X\sin\theta Y\cos\theta$ such that $x^2 + 2xy + y^2 = aX^2 = bY^2$, where a and b are constant then

A. $a = -1, b = 3, \theta = \frac{\pi}{4}$

B. $a = 1, b = -3, \theta = \frac{\pi}{3}$

C. $a = 3, b = -1, \theta = \frac{\pi}{4}$

D. $a = 3, b = -1, \theta = \frac{\pi}{3}$

Answer: C

Watch Video Solution

27. If

$X = x\cos\theta - y\sin\theta, Y = x\sin\theta + y\cos\theta$ and $X^2 + 4XY + Y^2 = Ax^2 -$

, then :

(where A and B are constants)

A. $\theta = \frac{\pi}{6}$

B. $\theta = \frac{\pi}{4}$

C. $A = -6$

D. $B = 1$

Answer: B

Watch Video Solution