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

(a) $ax+by=0$ (b) $ax-by=0$

(c) $bx+ay=0$ (d) $bx-ay=0$

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

(a) Isosceles and right angled

(b) Isosceles but not right angled

(c) Right angled but not isosceles

(d) Neither right angled nor isosceles

3. Each vertex of a right angled triangle is reflected in the opposite side. The ratio of the area of the line triangle thus formed and the original triangle is

(a) 2 (b) 3 (c) 4 (d) None of these

4. If A(6, 3), B(-3, 5), C (4, -2) and D(x, 3x) are four points. If the ratio of area of ΔDBC and ΔABC is 1 : 2, then the value of x, will be-

(a) $\frac{11}{8}$ (b) $\frac{8}{11}$ (c) 3 (d) None of these

5. If the three vertices of a rectangle taken in order are the points (2, -2), (8, 4) and (5, 7). The coordinates of the fourth vertex is-

(a) (1, 1) (b) (1, - 1) (c) (-1, 1) (d) None of these

6. The extremities of a diagonal of a parallelogram are the points (3, - 4) and (-6, 5). If third vertex is (-2, 1), then fourth vertex is:

(a) (1, 0) (b) (- 1, 0) (c) (1, 1) (d) None of these

7. Area of a triangle is 5. Its two vertices are (2, 1) and (3, -2). Third vertex is on line y = x + 3. That vertex will be-

(a) $\left(\frac{7}{2}, \frac{13}{2}\right)$ (b) (8, 14)

(c) $\left(\frac{8}{3}, \frac{5}{3}\right)$ (d) $\left(\frac{7}{3}, \frac{9}{7}\right)$

8. The distance between the orthocenter and circumcentre of the triangle with vertices (1, 0), $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$ and $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ is

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{1}{3}$ (d) 0

9. Two vertices of a triangle are (5, -1) and (-2, 3). If orthocentre of the triangle is the origin then coordinates of third vertex, are

(a) (-4, -7) (b) (-4, 7) (c) (4, 7) (d) (4, -7)

10. A (3, 1), B (6, 5) and C (x, y) are three points such that angle ACB is a right angle and the area of triangle ABC = 7sq. unit. then the number of such points C is-

(a) 0 (b) 1 (c) 2 (d) 3

11. The area of the pentagon whose vertices are (4, 1) (3, 6) (-5, 1) (-3, - 3) and (-3, 0) is

(a) 30 unit^2 (b) 60 unit^2 (c) 120 unit^2 (d) None

12. The equation $\sqrt{(x-2)^2+(y-1)^2} + \sqrt{(x+2)^2+(y-4)^2} = 5$ represents.

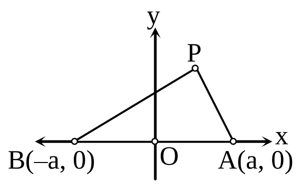
(a) Circle (b) Ellipse

(c) Line segment (d) None

13. Let A(2, 4), B(-3, -8) and C(x, y) are three points such that ∠ACB is a right angle and the area of ΔABC = (41/2) units. The number of such points C is

(a) 0 (b) 2 (c) 4 (d) Infinite

14. If AB = 2a, given the base of ΔABP, where P is a variable such that tanA + tanB = λ (constant), then the locus of P is-



(a) A circle (b) A parabola
(c) A hyperbola (d) None

15. A ray of light coming from the point (1, 2) is reflected at a point A on the x-axis and then passes through the point (5, 3). The coordinates of the point A are-

(a) $\left(\frac{13}{5}, 0\right)$ (b) $\left(\frac{5}{13}, 0\right)$
(c) (-7, 0) (d) None of these

16. If two vertices of an equilateral triangle have integral coordinates then the third vertex will have
(a) Integral coordinates
(b) Rational coordinates(c) At least one irrational coordinate
(d) Irrational coordinates

17. The area of the triangle with vertices at the points (a,b + c), (b, c + a), (c, a + b) is-
(a) 0 (b) a + b + c
(c) ab + bc + ca (d) None

18. The incentre of the triangle with vertices (1, $\sqrt{3}$), (0, 0) (2, 0) is-

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

19. The cartesian co-ordinates of $\left(-1, -\frac{\pi}{3}\right)$ is-

(a) $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ (b) $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$
(c) $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$ (d) $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

20. The line x + y = 4 divides the line joining the points (-1, 1) and (5, 7) in the ratio
(a) 2 : 1 (b) 1 : 2 (c) 1 : 2 externally (d) None

1. The equation of line passing through $\left(-1, \frac{\pi}{2}\right)$ and perpendicular to $\sqrt{3}\sin\theta + 2\cos\theta = \frac{4}{r}$ is

(a) $2 = \sqrt{3}\, r\cos\theta - 2r\sin\theta$ (b) $5 = -2\sqrt{3}\, r\sin\theta + 4r\cos\theta$

(c) $2 = \sqrt{3}\, r\cos\theta + 2r\sin\theta$ (d) $5 = 2\sqrt{3}\, r\sin\theta + 4r\cos\theta$

2. If the lines x = a + m, y = -2 and y = mx are concurrent, the least value of |a| is

(a) 0 (b) √2 (c) 2√2 (d) None of these

3. If the line passing through (4, 3) and (2, k) is perpendicular to y = 2x + 3, then k=

(a) -1 (b) 1 (c) -4 (d) 4

4. The equation of the base of an equilateral triangle ABC is x + y = 2 and the vertex is (2, -1). The area of the triangle ABC is

(a) $\frac{\sqrt{2}}{6}$ (b) $\frac{\sqrt{3}}{6}$ (c) $\frac{\sqrt{3}}{8}$ (d) None

5. If a point P moves such that its distance from line y = $\sqrt{3}$ x -7 is same as its distance from (2$\sqrt{3}$, -1), then area of curve described by P, enclosed between coordinate axes is-

(a) $\frac{\sqrt{3}}{2}$ (b) 2$\sqrt{3}$

(c) 6 (d) None of these

6. The circum-center of the triangle formed by the lines xy + 2x + 2y + 4 = 0 and x + y + 2 = 0 is -

(a) (-2, -2) (b) (0, 0)

(c) (-1, -2) (d) (-1, -1)

7. Equation of line inclined at an angle of 45º with positive x-axis and dividing the line joining the points (3, -1) and (8, 9) in the ratio 2 : 3 internally is-

(a) x - y - 2 = 0 (b) 3x - 3y + 1 = 0

(c) $\sqrt{3}$ x - $\sqrt{3}$ y + 2 = 0 (d) None of these

8. The straight lines represented by $(y - mx)^2 = a^2 (1 + m^2)$ and $(y - nx)^2 = a^2 (1 + n^2)$ form a-

(a) Rectangle (b) Trapezium

(c) Rhombus (d) None of these

9. A line which is parallel to the line common to pair of lines given by $6x^2 - xy - 12y^2 = 0$ and $15x^2 + 14xy - 8y^2 = 0$ and makes intercepts on axes whose sum of length is 7,is

(a) 2x - 3y = 42 (b) 3x + 4y = 12

(c) 5x - 2y = 10 (d) None of these

10. The point $(a^2, a + 1)$ lies in the angle between the lines 3x - y + 1 = 0 and x + 2y - 5 = 0 containing the origin, if-

(a) a∈ (-3, 0) ∪ $\left(\frac{1}{3}, 1\right)$ (b) a ∈ (-∞, 3) ∪ $\left(\frac{1}{3}, 1\right)$

(c) a∈ $\left(-3, \frac{1}{3}\right)$ (d) a ∈ $\left(\frac{1}{3}, \infty\right)$

11. For how many integral values of m do the lines y + mx - 1 = 0 and 3x + 4y = 9 intersect in points having integral coordinates -

(a) 0 (b) 1 (c) 2 (d) Infinite

12. Consider the locus of a moving point P(x, y) in the plane which satisfies the condition $2x^2 = r^2 + r^4$, where $r^2 = x^2 + y^2$

Then, only one of the following statement is true-

(a) For every 0 < r < 1, there are exactly four points on the curve

(b) For every 0 < r ≤ 1, there are exactly four points on the curve

(c) The locus is a pair of straight lines

(d) None of these

13. A (a, 0), B (b, 0), C (c, 0) and D(d, 0) are four given points. If $\frac{CA}{CB} + \frac{DA}{DB} = 0$, then-

(a) $\frac{1}{a} + \frac{1}{b} = \frac{1}{c} + \frac{1}{d}$ (b) (a + b) (c + d) = 2 (ab + cd)

(c) (a + b) ab = (c + d) cd (d) None of these

14. Number of lines drawn from the point (4, -5) so that its distance from (-2, 3) will be equal to 12 are-

(a) 2 (b) 1

(c) 4 (d) None of these

15. The equation of the lines which passes through the point (3, - 2) and are inclined at 60^0 to the line $\sqrt{3}x + y = 1$

(a) y + 2 = 0, $\sqrt{3}x - y - 2 - 3\sqrt{3} = 0$

(b) x - 2 = 0, $\sqrt{3}x - y + 2 + 3\sqrt{3} = 0$

(c) $\sqrt{3}x - y - 2 - 3\sqrt{3} = 0$

(d) None of these

16. If $\frac{1}{ab'} + \frac{1}{ba'} = 0$, then lines $\frac{x}{a} + \frac{y}{b} = 1$ and $\frac{x}{b'} + \frac{y}{a'} = 1$ are

(a) Parallel

(b) Inclined at 60^0 to each other

(c) Perpendicular to each other

(d) Inclined at 30^0 to each other

17. The distance between 4x + 3y = 11 and 8x + 6y = 15, is

(a) 7/2 (b) 4 (c) 7/10 (d) None of these

18. The straight lines $y = m_1 x + c_1$ and $y = m_2x + c_2$ will meet the co-ordinate axis in concyclic points if -

(a) $m_1 m_2 = 2$ (b) $c_1 c_2 = 2$

(c) $m_1 m_2 = 1$ (d) $c_1 c_2 = 1$

19. A line segment of length (a + b) moves in such a way that its ends are always on two fixed perpendicular straight lines. Then the locus of the point on this line which divide it into portions of lengths a and b is-

(a) A parabola (b) A circle

(c) An ellipse (d) None of these

20. If the algebraic sum of distances of points (2,1), (3,2) and (-4, 7) from the line y = mx + c is zero, then this line will always pass through a fixed point whose co-ordinate is-

(a) (1, 3) (b) (1, 10)

(c) (1, 6) (d) $\left(\frac{1}{3}, \frac{10}{3}\right)$

1. Let $f(x,y)=0$ be the equation of a circle. If $f(0,\lambda)=0$ has equal roots $\lambda=2,2$ and $f(\lambda,0)=0$ has roots $\lambda=\frac{4}{5},5,$ then the centre of the circle is

(a) $\left(2,\frac{29}{10}\right)$ (b) $\left(\frac{29}{10},2\right)$ (c) $\left(-2,\frac{29}{10}\right)$ (d) None

2. The polar of the point $\left(5,-\frac{1}{2}\right)$ with respect to circle $(x-2)^2+y^2=4$ is

(a) $5x-10y+2=0$ (b) $6x-y-20=0$

(c) $10x-y-10=0$ (d) $x-10y-2=0$

3. If circles $x^2+y^2+2ax+c=0$ and $x^2+y^2+2by+c=0$ touch each other, then

(a) $\frac{1}{a}+\frac{1}{b}=\frac{1}{c}$ (b) $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{c^2}$

(c) $\frac{1}{a}+\frac{1}{b}=c^2$ (d) $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{c}$

4. The common chord of $x^2+y^2-4x-4y=0$ and $x^2+y^2=16$ subtends at the origin an angle equal to

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{2}$

5. If the tangent at the point P on the circle $x^2+y^2+6x+6y=2$ meets the straight line $5x-2y+6=0$ at a point on the y-axis, then the length of PQ is

(a) 4 (b) $2\sqrt{5}$ (c) 5 (d) $3\sqrt{5}$

6. If length of common chord of two circles

$x^2+y^2+8x+1=0$ and $x^2+y^2+2\mu y-1=0$ is $2\sqrt{6}$, then value of μ are

(a) ± 2 (b) ± 3

(c) ± 4 (d) None of these

7. The range of parameter 'a' for which the variable line $y=2x+a$ lies between the circle $x^2+y^2-2x-2y+1=0$ and $x^2+y^2-16x-2y+61=0$ without intersecting or touching either circle, is -

(a) $(-15+2\sqrt{5}, -\sqrt{5}-1)$ (b) $(15+2\sqrt{5}, \sqrt{5}-1)$

(c) $(-15-2\sqrt{5}, -\sqrt{5}+1$ (d) $(-15+2\sqrt{5}, \sqrt{5}-1)$

8. If equation $(a+1)x^2+(b-1)y^2+(a-2b)xy-6x+9y-3=0$ represent a circle then its radius is

(a) 3/2 (b) 2/3

(c) 1 (d) $\sqrt{a^2+b^2}$

9. If a circle of constant radius 3k passes through the origin and meets the axes at A and B, the locus of centroid of ΔOAB is-

(a) $x^2+y^2=k^2$ (b) $x^2+y^2=2k^2$

(c) $x^2+y^2=3k^2$ (d) $x^2+y^2=4k^2$

10. If the circle $x^2+y^2-4x-6y+\lambda=0$ touches x- axis then the value of λ is

(a) -4 (b) 4 (c) -8 (d) 8

11. The equation of the line parallel to the line $3x+4y=0$ and touching the circle $x^2+y^2=9$ in the first quadrant is -

(a) $3x+4y=9$ (b) $3x+4y=45$

(c) $3x+4y=15$ (d) None of these

12. The locus of the centre of a circle which touches externally the circle $x^2+y^2-6x-6y+14=0$ and also touches the y-axis is given by the equation -

(a) $x^2-6x-10y+14=0$ (b) $x^2-10x-6y+14=0$

(c) $y^2 - 6x - 10y + 14 = 0$ (d) $y^2 - 10x - 6y + 14 = 0$

13. The circle $x^2 + y^2 - 6x - 10y + p = 0$ does not touch nor intersect the coordinate axes if the point (1, 4) lies inside the circle then -
(a) $0 < p < 29$ (b) $25 < p < 29$
(c) $25 < p < 35$ (d) None of these

14. The equation of the diameter of the circle
$x^2 + y^2 - 6x + 2y - 8 = 0$ is given by
(a) $x + 3y = 0$ (b) $x - 3y = 0$
(c) $x - 2y = 0$ (d) $x + 2y = 0$

15. If the chord $y = mx + 1$ of the circle $x^2 + y^2 = 1$ subtends an angle of measure 45° at the major segment of the circle then value of *m* is
(a) 2 (b) - 2 (c) ± 1 (d) None of these

16. If the distances from the origin to the centres of three circles $x^2 + y^2 + 2\lambda_i x - c^2 = 0\ (i = 1, 2, 3)$ are in *G.P.* then the lengths of the tangents drawn to them from any point on the circle $x^2 + y^2 = c^2$ are in
(a)*A.P.* (b)*G.P.* (c)*H.P.* (d) None of these

17. A foot of the normal from the point (4, 3) to a circle is (2, 1) and a diameter of the circle has the equation $2x - y = 2.$ Then the equation of the circle is
(a) $x^2 + y^2 + 2x - 1 = 0$ (b) $x^2 + y^2 - 2x - 1 = 0$
(c) $x^2 + y^2 - 2y - 1 = 0$ (d) None of these

18. The number of integral value of λ for which $x^2 + y^2 + 2\lambda x + 2(1 - \lambda)y - 1 = 0$ is the equation of a circle whose radius can not exceed 3
(a) 3 (b) 4 (c) 5 (d) None

19. In a triangle ABC, $r^2 + r_1^2 + r_2^2 + r_3^2 + a^2 + b^2 + c^2$ is equal to -
(a) $4R^2$ (b) $8R^2$ (c) $12R^2$ (d) $16R^2$

20. The area of the circle and the area of a regular polygon of n sides, and of perimeter equal to that of the circle are in the ratio of

(a) $\tan\left(\frac{\pi}{3}\right) : \frac{\pi}{n}$ (b) $\cot\left(\frac{\pi}{n}\right) : \frac{\pi}{n}$
(c) $\sin\left(\frac{\pi}{n}\right) : \frac{\pi}{n}$ (d) $\cos\left(\frac{\pi}{n}\right) : \frac{\pi}{n}$