

1. The polar coordinates of the vertices of a triangle are $(0, 0)$, $(3, \pi/2)$ and $(3, \pi/6)$. Then the triangle is
 (a) right angled (b) isosceles (c) equilateral (d) none of these
2. The points $(a, b + c)$, $(b, c + a)$, $(c, a + b)$ are
 (a) vertices of an equilateral triangle (b) collinear
 (c) concyclic (d) none of these
3. In the ΔABC , the coordinates of B are $(0, 0)$, $AB = 2$, $\angle ABC = \pi/3$ and the middle point of BC has the coordinates $(2, 0)$. The centroid of the triangle is
 (a) $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$ (b) $\left(\frac{5}{\sqrt{3}}, \frac{1}{\sqrt{3}}\right)$ (c) $\left(\frac{4 + \sqrt{3}}{3}, \frac{1}{3}\right)$ (d) none of these
4. A point moves in the x-y plane such that the sum of its distances from two mutually perpendicular lines is always equal to 3. The area enclosed by the locus of the point is
 (a) 18 unit^2 (b) $9/2 \text{ unit}^2$ (c) 9 unit^2 (d) none of these
5. The equation of the straight line which bisects the intercepts made by the axes on the lines $x + y = 2$ and $2x + 3y = 6$ is
 (a) $2x = 3$ (b) $y = 1$ (c) $2y = 3$ (d) $x = 1$
6. The graph of the function $\cos x \cdot \cos(x + 2) - \cos^2(x + 1)$ is a
 (a) straight line passing through the point $(0, -\sin^2 1)$ with slope 2
 (b) straight line passing through the origin
 (c) parabola with vertex $(1, -\sin^2 1)$
 (d) straight line passing through the point $(\pi/2, -\sin^2 1)$ and parallel to the x-axis
7. The point $(1, 1)$, $(-1, -1)$ and $(-\sqrt{3}, \sqrt{3})$ are the angular points of a triangle, then the triangle is
 (a) right angled (b) isosceles (c*) equilateral (d) none of these
8. The points $(0, 8/3)$, $(1, 3)$ and $(82, 30)$ are the vertices of
 (a) an obtuse angled triangle (b) an acute angled triangle
 (c) a right angled triangle (d) an isosceles triangle (e*) none of these
9. The triangle joining the points $A(2, 7)$, $B(4, -1)$, $C(-2, 6)$ is
 (a) equilateral (b*) right angled (c) isosceles
10. Points $(-2, 3)$, $(3, 8)$, $(4, 1)$ are the vertices of
 (a*) an isosceles triangle (b) a scalene triangle
 (c) an equilateral triangle (d) none of these
11. The points $(-a, -b)$, $(0, 0)$, (a, b) and (a^2, ab) are
 (a*) collinear (b) vertices of a parallelogram
 (c) vertices of a rectangle (d) none of these
12. Points $(1, -2)$, $(3, 0)$, $(1, 2)$, $(-1, 0)$ are the vertices of a
 (a) rectangle (b*) square (c) quadrilateral (d) none of these

13. If A and B are the points $(-3, 4)$ and $(2, 1)$. Then the co-ordinates of the point C on AB produced such that $AC = 2BC$ are
 (a) $(2, 4)$ (b) $(3, 7)$ (c*) $(7, -2)$ (d) $(-1/2, 5/2)$
14. A, B, C are the points $(-2, -1)$, $(0, 3)$, $(4, 0)$. Then the co-ordinates of the point D such that ABCD is a parallelogram is
 (a*) $(2, -4)$ (b) $(-2, 4)$ (c) $(2, 4)$ (d) $(4, 2)$
15. P and Q are points on the line joining $A(-2, 5)$ and $B(3, 1)$ such that $AP = PQ = QB$. Then the mid point of PQ is
 (a*) $(1/2, 3)$ (b) $(-1/2, 4)$ (c) $(2, 3)$ (d) $(1, 4)$
16. The area of the triangle with vertices at $(-4, -1)$, $(1, 2)$, $(4, -3)$ is
 (a*) 17 (b) 16 (c) 15 (d) none of these
17. Two vertices of a triangle are $(-4, 3)$ and $(2, 6)$. Its centroid is $(0, 0)$, the third vertex is
 (a*) $(2, -9)$ (b) $(-9, 2)$ (c) $(9, 2)$ (d) $(2, 9)$
18. The area of the triangle formed by joining the points $(0, 1)$, $(1, 2)$ and $(-2, -1)$ is
 (a) 40 (b) 10 (c*) 0 (d) 8
19. The area of triangle with the vertices at the point $(a, b+c)$, $(b, c+a)$, $(c, a+b)$ is
 (a*) 0 (b) $a + b + c$ (c) $ab + bc + ca$ (d) none of these
20. If a and b are real numbers between 0 and 1 such that the points $(a, 1)$, $(1, b)$ and $(0, 0)$ form an equilateral triangle then
 (a*) $(a = 2 - \sqrt{3})$, $(b = 2 - \sqrt{3})$ (b) $(a = 2 + \sqrt{3})$, $(b = 2 + \sqrt{3})$
 (c) $(a = \sqrt{3} + 2)$, $(b = \sqrt{3} + 2)$ (d) $(a = \sqrt{3} - 2)$, $(b = \sqrt{3} - 2)$
21. The point $(4, 1)$ undergoes the following two transformations successively
 I. reflection about the line $y = x$
 II. translation through a distance 2 units along the positive direction of x-axis.
 (a*) $(3, 4)$ (b) $(4, 3)$ (c) $(-4, 3)$ (d) $(-3, 4)$
22. The co-ordinates of the points of trisection of the join of the points $(-2, 3)$, $(3, -1)$ nearer to $(-2, 3)$ is
 (a*) $\left(-\frac{1}{3}, \frac{5}{3}\right)$ (b) $\left(\frac{4}{3}, \frac{1}{3}\right)$ (c) $\left(-\frac{1}{3}, 2\right)$ (d) $\left(\frac{1}{3}, \frac{5}{3}\right)$
23. The three vertices of a parallelogram are $(a + b, a - b)$, $(2a + b, 2a - b)$ and $(a - b, a + b)$, the fourth vertex is
 (a*) (b, b) (b) $(-b, -b)$ (c) (b, a) (d) none of these
24. The equation of the straight line which passes through the point $(1, -2)$ and cuts of equal intercepts from axes will be
 (a) $x + y = 1$ (b) $x - y = 1$ (c*) $x + y + 1 = 0$ (d) $x - y - 2 = 0$

25. The angle between the lines $2x + 3 = 0$ and $3y = 5$ is
 (a) 0° (b) 30° (c) 60° (d*) 90°
26. If the lines $lx + my + n = 0$ and $px + qy + r = 0$ are perpendicular, then
 (a) $lp - mq = 0$ (b*) $lp + mp = 0$ (c) $lm = pq$ (d) $lm + pq = 0$
27. If the lines $3x - 4y + 7 = 0$ and $ax + 6y + 1 = 0$ are perpendicular, then a is equal to
 (a) 4 (b) 5 (c) 10 (d*) 8
28. The equation of the line passing through (1, 2) and perpendicular to the line $x + y + 4 = 0$ is
 (a) $y - x + 1 = 0$ (b*) $y - x - 1 = 0$
 (c) $y - x + 2 = 0$ (d) $y - x - 2 = 0$
29. The equation of the straight line which is perpendicular to $y = x$ and passes through (3, 2) will be given by
 (a) $x - y = 5$ (b*) $x + y = 5$ (c) $x + y = 1$ (d) $x - y = 1$
30. The equation of the straight line through (4, 0) and parallel to line $2x - 2y - 3 = 0$ is
 (a) $2x - 2y = 10$ (b*) $2x - 2y - 8 = 0$
 (c) $2x - 2y + 2 = 0$ (d) $x - y = 4$

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