1. Line L has intercepts a and b on the coordinate axes. When the axes are rotated through a given angle; keeping the origin fixed, the same line has intercepts p and q. Then (a*b*c*)

(a*) $a^2 + b^2 = p^2 + q^2$ (b*) $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{p^2}+\frac{1}{q^2}$

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

2. The point P (1, 1) is translated parallel to 2x = y in the first quadrant through a unit distance. The coordinates of the new position of P are (b*d*)

(a) $\left(1\pm\frac{2}{\sqrt{5}},1\pm\frac{1}{\sqrt{5}}\right)$ (b*) $\left(1\pm\frac{1}{\sqrt{5}},1\pm\frac{2}{\sqrt{5}}\right)$

(c) $\left(\frac{1}{\sqrt{5}},\frac{2}{\sqrt{5}}\right)$ (d) $\left(\frac{2}{\sqrt{5}},\frac{1}{\sqrt{5}}\right)$

3. Points on the line x + y = 4 that lie at a unit distance from the line 4x + 3y – 10 = 0 are
(a) (3, 1) and (– 7, 11) (b) (– 3, 7) and (2, 2)
(c) (– 3, 7) and (– 7, 11) (d*) none of these

4. One vertex of the equilateral triangle with centroid at the origin and one side as x + y – 2 = 0 is
(a) (– 1, – 1) (b) (2, 2) (c) (– 2, – 2) (d*) none of these

5. The distance of the line x + y – 8 = 0 from (4, 1) measured along the direction whose slope is – 2 is
(a*) 3 √5 (b) 6 √5 (c) 2 √5 (d) none of these

6. The area enclosed within the curve | x | + | y | = 1, is
(a) 1 sq. units (b) 2 sq. units
(c*) 3 sq. units (d) 4 sq. units

7. The orthocentre of the triangle formed by the lines x + y = 1, 2x + 3y = 6 and 4x – y + 4 = 0 lies in
(a*) I quadrant (b) II quadrant
(c*) III quadrant (d) IV quadrant

8. 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

9. The area of the figure formed by the lines ax ± by ± c = 0 is

(a*) $\frac{c^2}{ab}$ (b) $\frac{2c^2}{ab}$ (c) $\frac{c^2}{2ab}$ (d*) none of these

10. The incentre of the triangle formed by the lines x = 0, y = 0 and 3x + 4y = 12 is at

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

11. The point (1, 1), (– 1, – 1) and (– √3, √3) are the angular points of a triangle, then the triangle is

(a) right angled (b) isosceles (c) equilateral (d) none of these

12. 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

13. The triangle joining the points A(2, 7), B(4, – 1), C(– 2, 6) is

(a) equilateral (b) right angled (c) isosceles

14. 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

15. 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

16. Points (1, – 2), (3, 0), (1, 2), (– 1, 0) are the vertices of a

(a) rectangle (b) square (c) quadrilateral (d) none of these

17. 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)

18. 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)

19. 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)

20. 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

21. 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)

22. 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

23. 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)

24. 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) $\left(\frac{1}{3},\frac{5}{3}\right)$

25. 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

26. 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

27. The angle between the lines 2x + 3 = 0 and 3y = 5 is

(a) 0° (b) 30° (c) 60° (d) 90°

28. 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

29. 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

30. 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