Straight Lines

Subjects : Maths **Previous Year Questions**

Maths - Section A (MCQ)

1. If two sides of a square lie on the lines $2x + y - 3 = 0$ and $4x + 2y + 5 = 0$, then what is the area of the square in square units?

A) 6.05 **B)** 6.15 **C)** 6.25 **D)** 6.35

2. What is the equation to the straight line passing through the point $(-\sin\theta, \cos\theta)$ and perpendicular to the line $x\cos\theta + y\sin\theta = 9$?

A) $x\sin\theta - y\cos\theta - 1 = 0$ **B)** $x\sin\theta - y\cos\theta + 1 = 0$ **C)** $x\sin\theta - y\cos\theta = 0$ **D)** $x\cos\theta - y\sin\theta + 1 = 0$

3. ABC is a triangle with $\mathrm{A}(3, 5)$. The mid-points of sides AB, AC are at $(-1, 2), (6, 4)$ respectively. What are the coordinates of centroid of the triangle ABC ?

A) $(\frac{8}{3}, \frac{11}{3})$ **B)** $(\frac{7}{3}, \frac{7}{3})$ **C)** $(2, \frac{8}{3})$ **D)** $(\frac{8}{3}, 2)$

4. If $\mathrm{P}(2, 4), \mathrm{Q}(8, 12), \mathrm{R}(10, 14)$ and $\mathrm{S}(x, y)$ are vertices of a parallelogram, then what is $(x + y)$ equal to?

A) 8 **B)** 10 **C)** 12 **D)** 14

5. If the variable line passes through the point of intersection of the lines $x + 2y - 1 = 0$ and $2x - y - 1 = 0$ and meets the coordinate axes in A and B , then what is the locus of the mid-point of AB ?

A) $3x + y = 10xy$ **B)** $x + 3y = 10xy$ **C)** $3x + y = 10$ **D)** $x + 3y = 10$

6. The number of points represented by the equation $x = 5$ on the xy-plane is:

A) Zero **B)** One **C)** Two **D)** Infinitely many

7. ABC is an acute angled isosceles triangle. Two equal sides AB and AC lie on the lines $7x - y - 3 = 0$ and $x + y - 5 = 0$. If θ is one of the equal angles, then what is $\cot\theta$ equal to?

A) $\frac{1}{3}$ **B)** $\frac{1}{2}$ **C)** $\frac{2}{3}$ **D)** 2

8. The diagonals of a quadrilateral ABCD are along the lines $x - 2y = 1$ and $4x + 2y = 3$. The quadrilateral ABCD may be a

A) rectangle **B)** cyclic quadrilateral **C)** parallelogram **D)** rhombus

9. The points $(-a, -b), (0, 0), (a, b)$ and (a^2, ab) are:

A) lying on the same circle **B)** vertices of a square

C) vertices of a parallelogram that is not a square **D)** collinear

10. The line $x + y = 4$ cuts the line joining $P(-1, 1)$ and $\mathrm{Q}(5, 7)$ at R . What is PR : RQ equal to ?

A) $1:1$ **B)** $1:2$ **C)** $2:1$ **D)** $1:3$

11. For what value of k is the line $(k-3)x-(5-k^2)\,y+k^2-7k+6=0$ parallel to the line $x+y=1$?

A) – 1, 1 **B)** – 1, 2 **C)** 1, – 2 **D)** 2, – 2

12. What is the sum of the intercepts of the line whose perpendicular distance from origin is 4 units and the angle which the normal makes with positive DIRECTIONS of x-axis is 15° ?

A) 8 **B)** $4\sqrt{6}$ **C)** $8\sqrt{6}$ **D)** 16

13. If the points with coordinates $(-5,0),(5p^2,10p)$ and $(5q^2,10q)$ are collinear, then what is the value of pq where $p\neq q$?

A) -2 **B)** -1 **C)** 1 **D)** 2

14. What is the equation of the locus of the mid-point of the line segment obtained by cutting the line $x+y=p$, (where p is a real number) by the coordinate axes?

A) $x-y=0$ **B)** $x+y=0$ **C)** $x-y=p$ **D)** $x+y=p$

15. What is the equation of the straight line which passes through the point $(1,-2)$ and cuts off equal intercepts from the axes?

A) $x+y-1=0$ **B)** $x-y-1=0$ **C)** $x+y+1=0$ **D)** $x-y-2=0$

16. A straight line passes through the point of intersection of $x+2y+2=0$ and $2x-3y-3=0$. It cuts equal intercepts in the fourth quadrant. What is the sum of the absolute values of the intercepts?

A) 2 **B)** 3 **C)** 4 **D)** 6

17. If $P(3,4)$ is the mid-point of a line segment between the axes, then what is the equation of the line?

A) $3x+4y-25=0$ **B)** $4x+3y-24=0$ **C)** $4x-3y=0$ **D)** $3x-4y+7=0$

18. The base AB of an equilateral triangle ABC with side 8 cm lies along the y-axis such that the mid-point of AB is at the origin and B lies above the origin. What is the equation of line passing through $(8,0)$ and parallel to the side AC ?

A) $x-\sqrt{3}y-8=0$ **B)** $x+\sqrt{3}y-8=0$ **C)** $\sqrt{3}x+y-8\sqrt{3}=0$ **D)** $\sqrt{3}x-y-8\sqrt{3}=0$

19. If the image of the point $(-4,2)$ by a line mirror is $(4,-2)$, then what is the equation of the line mirror?

A) $y=x$ **B)** $y=2x$ **C)** $4y=x$ **D)** $y=4x$

20. What is the interior angle of a regular octagon of side length 2 cm ?

A) $\frac{\pi}{2}$ **B)** $\frac{3\pi}{4}$ **C)** $\frac{3\pi}{5}$ **D)** $\frac{3\pi}{8}$

21. A parallelogram has three consecutive vertices $(-3,4)$, $(0,-4)$ and $(5,2)$. The fourth vertex is

A) $(2,10)$ **B)** $(2,9)$ **C)** $(3,9)$ **D)** $(4,10)$

22. The two vertices of an equilateral triangle are $(0,0)$ and $(2,2)$.
The difference of coordinates of the third vertex is

A) 0 **B)** $\sqrt{3}$ **C)** $2\sqrt{2}$ **D)** $2\sqrt{3}$

23. The coordinates of three consecutive vertices of a parallelogram $ABCD$ are $A(1,3),B(-1,2)$ and $C(3,5)$.
What is the equation of the diagonal BD?

A) $2x-3y+2=0$ **B)** $3x-2y+5=0$ **C)** $2x-3y+8=0$ **D)** $3x-2y-5=0$

24. If the lines $y+px=1$ and $y-qx=2$ are perpendicular, then which one of the following is correct?

A) $pq+1=0$ **B)** $p+q+1=0$ **C)** $pq-1=0$ **D)** $p-q+1=0$

25. Under which condition, are the points $(a,b),(c,d)$ and $(a-c,b-d)$ collinear?

A) $ab = cd$ B) $ac = bd$ C) $ad = bc$ D) $abc = d$

26. If the foot of the perpendicular drawn from the point $(0, k)$ to the line $3x - 4y - 5 = 0$ is $(3, 1)$, then what is the value of k ?

A) 3 B) 4 C) 5 D) 6

27. If the circumcentre of the triangle formed by the lines $x + 2 = 0, y + 2 = 0$ and $kx + y + 2 = 0$ is $(-1, -1)$, then what is the value of k ?

A) -1 B) -2 C) 1 D) 2

28. A straight line cuts off an intercept of 2 units on the positive direction of x-axis and passes through the point $(-3, 5)$. What is the foot of the perpendicular drawn from the point $(3, 3)$ on this line?

A) $(1, 3)$ B) $(2, 0)$ C) $(0, 2)$ D) $(1, 1)$

29. A straight line intersects x and y yxes at P and Q respectively. If $(3, 5)$ is the middle point of PQ, then what is the area of thetriangle OPQ?

A) 12 square units B) 15 square units C) 20 square units D) 30 square units

30. The angle between the lines $x + y - 3 = 0$ and $x - y + 3 = 0$ is α and the acute angle between the lines $x - \sqrt{3}y + 2\sqrt{3} = 0$ and $\sqrt{3}x - y + 1 = 0$ is β. Which one of the following is correct?

A) $\alpha = \beta$ B) $\alpha > \beta$ C) $\alpha < \beta$ D) $\alpha = 2\beta$

31. What is the acute angle between the pair of straight lines $\sqrt{2}x + \sqrt{3}y = 1$ and $\sqrt{3}x + \sqrt{2}y = 2$?

A) $\tan^{-1}\left(\frac{1}{2\sqrt{6}}\right)$ B) $\tan^{-1}\left(\frac{1}{\sqrt{2}}\right)$

C) $\tan^{-1}(3)$ D) $\tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$

32. The equation of the line passing through the point $(2, 3)$ and the point of intersection of lines $2x - 3y + 7 = 0$ and $7x + 4y + 2 = 0$ is

A) $21\mathrm{x} + 46\mathrm{y} - 180 = 0$ B) $21x - 46y + 96 = 0$ C) $46x + 21y + 155 = 0$ D) $46x - 21y - 29 = 0$

33. The equation of a straight line which cuts off an intercept of 5 units on negative direction of y-axis and makes an angle 120° with positive direction of x -axis is

A) $\mathrm{y} + \sqrt{3}\mathrm{x} + 5 = 0$ B) $y - \sqrt{3}x + 5 = 0$ C) $y + \sqrt{3}x - 5 = 0$ D) $y - \sqrt{3}x - 5 = 0$

34. If the centroid of a triangle formed by $(7, x), (y, -6)$ and $(9, 10)$ is $(6, 3)$, then the values of x and y are respectively

A) 5,2 B) 2,5 C) 1,0 D) 0,0

35. The incentre of the triangle with vertices $\mathrm{A}(1, \sqrt{3}), \mathrm{B}(0, 0)$ and $C(2, 0)$ 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) $\left(1, \frac{1}{\sqrt{3}}\right)$

36. If a vertex of a triangle is $(1, 1)$ and the midpoints of two sides of the triangle through this vertex are $(-1, 2)$ and $(3, 2)$, then the centroid of the triangle is

A) $(-\frac{1}{3}, \frac{7}{3})$ B) $(-\frac{1}{3}, \frac{7}{3})$

C) $(\frac{1}{3}, \frac{7}{3})$ D) $(1, \frac{7}{3})$

37. The distance of the point $(1, 3)$ from the line $2x + 3y = 6$, measured parallel to the line $4x + y = 4$, is

A) $\frac{5}{\sqrt{13}}$ units B) $\frac{3}{\sqrt{17}}$ unit C) $\sqrt{17}$ units D) $\frac{\sqrt{17}}{2}$ units

38. If the point (x, y) is equidistant from the points $(2a, 0)$ and $(0, 3a)$ where $a > 0$, then which one of the following is correct?

A) $2x - 3y = 0$ **B)** $3x - 2y = 0$ **C)** $4x - 6y + 5a = 0$ **D)** $4x - 6y - 5a = 0$

39. Under which one of the following conditions are the lines $ax + by + c = 0$ and $bx + ay + c = 0$ parallel $(a \neq 0, b \neq 0)$?

A) $a - b = 0$ only **B)** $a + b = 0$ only **C)** $a^2 - b^2 = 0$ **D)** $ab + 1 = 0$

40. If A, B and C are in AP , then the straight line $Ax + 2By + C = 0$ will always pass through a fixed point. The fixed point is

A) $(0, 0)$ **B)** $(-1, 1)$ **C)** $(1, -2)$ **D)** $(1, -1)$

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1 - A	2 - B	3 - B	4 - B	5 - B	6 - D	7 - B	8 - D	9 - D	10 - B
11 - B	12 - C	13 - C	14 - A	15 - C	16 - A	17 - B	18 - A	19 - B	20 - B
21 - A	22 - D	23 - C	24 - C	25 - C	26 - C	27 - C	28 - D	29 - D	30 - B
31 - A	32 - B	33 - A	34 - A	35 - D	36 - D	37 - D	38 - C	39 - C	40 - D