MATHS

BOOKS - SAI MATHS (TELUGU ENGLISH)

STRAIGHT LINE

Exercise Problems

1. An equation of a line whose segment between the coordinates axes is divided by the point $\left(\frac{1}{2}, \frac{1}{3}\right)$ in the ratio $2:3$ is

A. $6x + 9y = 5$

B. $9x + 6y = 5$

C. $4x + 9y = 5$

D. $9x + 4y = 5$

Answer: C

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2. The value of $K > 0$ such that the angle between the lines $4x - y + 7 = 0$ and $kx - 5y - 9 = 0$ is 45°, is

A. $\frac{25}{3}$

B. $\frac{5}{3}$

C. 3

D. 5

Answer: C

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3. The locus of the point P which is equidistant from $3x + 4y + 5 = 0$ and $9x + 12y + 7 = 0$

A. a hyperbola

B. an ellipse

C. a parabola

D. a straight line

Answer: D

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4. If the equation to the locus of points equidistant from the points $(-2, 3), (6, -5)$ is $ax + by + c = 0$ where $a < 0$ then, the ascending order of a, b, c is

A. a, b, c

B. c, b, a

C. b, c, a

D. a, c, b

Answer: B

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5. If the straight lines $2x + 3y - 1 = 0, x + 2y - 1 = 0, andax + by - 1 = 0$ form a triangle with the origin as orthocentre, then (a, b) is given by $(6, 4)$ (b) $(- 3, 3)$ $(- 8, 8)$ (d) $(0, 7)$

A. $(6, 4)$

B. $(- 3, 3)$

C. $(- 8, 8)$

D. $(0, 7)$

Answer: C

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6. The point on the line $4x - y - 2 = 0$ which is equidistant from the points $(-5, 6)$ and $(3, 2)$ is

A. $(2, 6)$

B. $(4, 14)$

C. $(1, 2)$

D. $(3, 10)$

Answer: B

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7. If the lines $x + 2ay + a = 0, x + 3by + b = 0$ and $x + 4cy + c = 0$ are concurrent then a, b, c are in

A. Arithmetic progression

B. Geometric progression

C. Harmonic progression

D. Arithmetic-geometric progression

Answer: C

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8. The equation of a straight line, perpendicular to $3x - 4y = 6$ and forming a triangle of area 6 sq. units with coordinates axes, is

A. $x - 2y = 6$

B. $4x + 3y = 12$

C. $4x + 3y + 24 = 0$

D. $3x + 4y = 12$

Answer: B

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9. If the image of $(-7/5, -6/5)$ in a line is (1, 2), then the equation of the line is

A. $4x + 3y = 1$

B. $3x - y = 0$

C. $4x - y = 0$

D. $3x + 4y = 1$

Answer: D

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10. If a line I passes through $(k, 2k), (3k, 3k)$ and $(3, 1), k \neq 0$, then the distance from the origin to the line I is

A. $\frac{1}{\sqrt{5}}$

B. $\frac{4}{\sqrt{5}}$

C. $\frac{3}{\sqrt{5}}$

D. $\frac{2}{\sqrt{5}}$

Answer: A

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11. If p and q are the perpendicular distances from the origin to the straight lines $x\sec\theta - y\cos ec\theta = a$ and $x\cos\theta + y\sin\theta = a\cos 2\theta$, then

A. $4p^2 + q^2 = a^2$

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

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

D. $4p^2 + q^2 = 2a^2$

Answer: A

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12. If $2x + 3y = 5$ is the perpendicular bisector of the line segment joining the points A $\left(1, \frac{1}{3}\right)$ and B, then B is equal to

A. $\left(\frac{21}{13}, \frac{49}{39}\right)$

B. $\left(\frac{17}{13}, \frac{31}{39}\right)$

C. $\left(\frac{7}{13}, \frac{49}{39}\right)$

D. $\left(\frac{21}{13}, \frac{31}{39}\right)$

Answer: A

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13. Find the set of values of a if the points $(1, 2)$ and $(3, 4)$ lie to the same side of the straight line $3x - 5y + a = 0$

A. $[7, 11]$

B. $R - [7, 11]$

C. $[7, \infty]$

D. $[-\infty, 11]$

Answer: B

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14. The perpendicular distance from the point $(1, \pi)$ to the line joining $(1, 0^\circ)$ and $\left(1, \frac{\pi}{2}\right)$, (in polar

coordinates) is

A. 2

B. $\sqrt{3}$

C. 1

D. $\sqrt{2}$

Answer: D

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15. The equation of a straight line passing through the point (1, 2) and inclined at 45° to the line $y = 2x + 1$ is

A. $5x + y = 7$

B. $3x + y = 5$

C. $\pi + y = 3$

D. $x - y + 1 = 0$

Answer: B

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16. A point moves in the xy-plane such that the sum of its distances from two mutually perpendicular lines is always equal to 5 units. The are (in square units) enclosed by the locus of the point, is

A. $\frac{25}{4}$

B. 25

C. 50

D. 100

Answer: C

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17. The number of points P(x, y) with natural numbers as coordinates that lie inside the quadrilateral formed by the lines $2x + y = 2, x = 0, y = 0$ and $x + y = 5$ is

A. 12

B. 10

C. 6

D. 4

Answer: C

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18. The image of the point (3, 8) in the line $x + 3y = 7$ is

A. $(1, 4)$

B. $(4, 1)$

C. $(-1, -4)$

D. $(-4, -1)$

Answer: C

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19. The line joining the points $A(2, 0)$ and $B(3, 1)$ is rotated through an angle of 45°, about A in the anti-clockwise direction. The coordinates of B in the new position

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

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

C. $(2, 2)$

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

Answer: A

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20. The polar equation of the line perpendicular to the line $\sin\theta - \cos\theta = \frac{1}{r}$ and passing through the point $\left(2, \frac{\pi}{6}\right)$ is

A. $\sin\theta + \cos\theta = \frac{\sqrt{3}+1}{r}$

B. $\sin\theta - \cos\theta = \frac{\sqrt{3}+1}{r}$

C. $\sin\theta + \cos\theta = \frac{\sqrt{3}-1}{r}$

D. $\cos\theta - \sin\theta = \frac{\sqrt{3}}{r}$

Answer: A

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21. If a straight line L is perpendicular to the line $4x - 2y = 1$ and forms a triangle of area 4 square units with the coordinate axes, then an equation of the line L is

A. $2x + 4y + 7 = 0$

B. $2x - 4y + 8 = 0$

C. $2x + 4y + 8 = 0$

D. $4x - 2y - 8 = 0$

Answer: C

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22. The image of the point (4, -13) with respect to the line $5x + y + 6 = 0$ is :

A. $(-1, -14)$

B. $(3, 4)$

C. $(1, 2)$

D. $(-4, 13)$

Answer: A

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23. The image of the line $x + y - 2 = 0$ in the y-axis is

A. $x - y + 2 = 0$

B. $y - x + 2 = 0$

C. $x + y + 2 = 0$

D. $x + y - 2 = 0$

Answer: A

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24. A straight line which makes equal positive intercepts on X and Y axes and which is at a distance 1 unit from the origin intersects the straight line $y = 2x + 3 + \sqrt{2}$ at (x_0, y_0). Then $2x_0 + y_0$ is equal to

A. $3 + \sqrt{2}$

B. $\sqrt{2} - 1$

C. 1

D. 0

Answer: B

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25. The area (in square unit) of the circle which touches the lines $4x + 3y = 15$ and $4x + 3y = 5$ is

A. 4π

B. 3π

C. 2π

D. π

Answer: D

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26. The point on the line $3x + 4y = 5$ which is equidistant from (1, 2) and (3, 4) is :

A. $(7, -4)$

B. $(15, -10)$

C. $(1/7, 8/7)$

D. $(0, 5/4)$

Answer: B

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27. The equation of the straight line perpendicular to the straight line $3x + 2y = 0$ and passing through the point of intersection of the lines $x + 3y - 1 = 0$ and $x - 2y + 4 = 0$ is

A. $2x - 3y + 1 = 0$

B. $2x - 3y + 3 = 0$

C. $2x - 3y + 5 = 0$

D. $2x - 3y + 7 = 0$

Answer: D

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28. If the sum of the distance of a point P from two perpendicular lines in a plane is 1, then the locus of P is a

A. Rhombus

B. Circle

C. Straight line

D. Pair of straight lines

Answer: C

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29. If 1, m, n are in arithmetic progression, then the straight line $lx + my + n = 0$ will pass through the

point.

A. $(-1, 2)$

B. $(1, -2)$

C. $(1, 2)$

D. $(2, 1)$

Answer: B

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30. The value of k such that the lines $2x - 3y + k = 0, 3x - 4y - 13 = 0$ and $8x - 11y - 33 = 0$ are concurrent, is

A. 20

B. -7

C. 7

D. -20

Answer: B

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31. The angle between the line joining the points $(1, -2), (3, 2)$ and the line $x + 2y - 7 = 0$, is

A. π

B. $\pi/2$

C. $\pi/3$

D. $\pi/6$

Answer: B

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32. If $A(2, -1)$ and $B(6, 5)$ are two points. The ratio in which the foot of the perpendicular from $(4, 1)$ to AB divides it, is

A. $8:15$

B. $5:8$

C. $-5:8$

D. $-8:5$

Answer: B

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33. The lines $x - y - 2 = 0, x + y - 4 = 0$ and $x + 3y = 6$ meet at the common point

A. $(1, 2)$

B. $(2, 2)$

C. $(3, 1)$

D. $(1, 1)$

Answer: C

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34. The equation of the line passing through the point of intersection of the lines $x - 3y + 2 = 0$ and $2x + 5y - 7 = 0$ and perpendicular to the line $3x + 2y + 5 = 0$, is

A. $2x - 3y + 1 = 0$

B. $6x - 9y + 11 = 0$

C. $2x - 3y + 5 = 0$

D. $2x - 2y + 1 = 0$

Answer: A

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35. If PM is the perpendicular from $P(2, 3)$ onto the line $x + y = 3$, then the coordinates of M are

A. $(2, 1)$

B. $(-1, 4)$

C. $(1, 2)$

D. $(4, -1)$

Answer: C

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36. The equation of the straight line perpendicular to 5x-2y=7 and passing through the point of intersection of the

lines 2x + 3y =1 and 3x +4y =6 is

A. $2x + 5y + 17 = 0$

B. $2x + 5y - 17 = 0$

C. $2x - 5y + 17 = 0$

D. $2x - 5y = 17$

Answer: A

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37. Suppose A,B are two points on $2x - y + 3 = 0$ and $P(1, 2)$ is such that $PA = PB$. Then, the mid-point of AB is

A. $\left(\frac{-1}{5}, \frac{13}{5}\right)$

B. $\left(\frac{-7}{5}, \frac{9}{5}\right)$

C. $\left(\frac{7}{5}, \frac{-9}{5}\right)$

D. $\left(\frac{-7}{5}, \frac{-9}{5}\right)$

Answer: A

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38. The polar equation $\cos\theta + 7\sin\theta = \frac{1}{r}$ represents a

A. circle

B. parabola

C. Straight line

D. hyperbola

Answer: C

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39. If the lines $3y + 4x = 1, y = x + 5$ and $5y + bx = 3$ are concurrent the n $b =$

A. 4

B. 5

C. 6

D. 7

Answer: C

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40. The 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. $5 = 2\sqrt{3}r\sin\theta + 4r\cos\theta$

Answer: A

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41. If a straight line perpendicular to $2x - 3y + 7 = 0$ forms a triangle with the coordinates axes whose area is 3 sq unit, then the equation of the straight line is

A. $3x + 2y = \pm 2$

B. $3x + 2y = \pm 6$

C. $3x + 2y = \pm 4$

D. $3x + 2y = \pm 8$

Answer: B

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42. If (-2,6) is the image of the point (4,2) with respect to line L=0, then L is:

A. $6x - 4y - 7 = 0$

B. $2x + 3y - 5 = 0$

C. $3x - 2y + 5 = 0$

D. $3x - 2y + 10 = 0$

Answer: C

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43. For all the values of 'a' and 'b', the lines $(a + 2b)x + (a - b)y + (a + 5b) = 0$ passes through

the point

A. $(-1, 2)$

B. $(2, -1)$

C. $(-2, 1)$

D. $(1, -2)$

Answer: C

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44. The line $2x + 3y = 6, 2x + 3y - 8$ cut the X-axis at A,B respectively. A line $L = 0$ drawn through the point $(2, 2)$ meets the X-axis at C in such a way that abscissa of

A,B,C are in arithmetic Progression. then the equation of the line L is

A. $2x + 3y = 10$

B. $8x + 2y = 10$

C. $2x - 3y = 10$

D. $8x - 2y = 10$

Answer: A

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45. Incentre of the triangle formed by the lines $x + y = 1, x = 1, y = 1$ is

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

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

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

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

Answer: C

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