MATHS

BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

STRAIGHT LINES

Solved Examples

1. A straight line meets the coordinates axes at A and B, so that the centroid of the triangle OAB is (1, 2). Then the equation of the line AB is

A. $x + y = 6$

B. $2x + y = 6$

C. $x + 2y = 6$

D. $3xI + y = 6$

Answer: B

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2. The equation of the line passing through (2, 2) and having intercepts whose sum is -1 is

A. $x - y + 1 = 0$

B. $x - y + 7 = 0$

C. $x - 2y + 2 = 0$ or $2x - y - 2 = 0$

D. $2x + 3y = 1$ or $5x - 3y = 12$

Answer: C

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3. The slope of a straight line passing through A(-2, 3) is $-4/3$. The points on the line that are 10 unit away from A are

A. (-8, 11), (4, -5)

B. (-7, 9), (17, -1)

C. (7, 5), (-1, -1)

D. (6, 10), (3, 5)

Answer: A

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4. If the lines $14x + 7y = 44, 9x + 7y = 23, 8x + 14y = \lambda$ are concurrent, then $\lambda =$

A. -1

B. -2

C. -7

D. 4

Answer: D

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

A. $3x + 4y - 2 = 0$

B. $4x - 3y + 11 = 0$

C. $4x - 3y - 11 = 0$

D. $3x + 4y + 2 = 0$

Answer: B

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6. The foot of the perpendicular from (3, 4) to the line $3x - 4y = 18$ is

A. (4, 4)

B. (2, -3)

C. (-4, 4)

D. (6, 0)

Answer: D

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7. The equation of the line which is at 10 units from the origin and the normal from the origin to it makes as angle $\frac{\pi}{4}$ with the X-axis in the negative direction is

A. $x + y + 10\sqrt{2} = 0$

B. $x - y - 10\sqrt{2} = 0$

C. $x + y - 10\sqrt{2} = 0$

D. $x - y + 10\sqrt{2} = 0$

Answer: D

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8. The equations of the two sides of a square whose area is 25 sq. Units are $3x - 4y = 0$ and $4x + 3y = 0$. The equations of the other two sides of the square are

A. $3x - 4y \pm 25 = 0, 4x + 3y \pm 25 = 0$

B. $3x - 4y \pm 5 = 0, 4x + 3y \pm 5 = 0$

C. $3x - 4y \pm 15 = 0, 4x + 3y \pm 15 = 0$

D. $3x - 4y \pm 10 = 0, 4x + 3y \pm 10 = 0$

Answer: A

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9. Find the number of integer values of m for which the x-coordinate of the point of intersection of the lines $3x + 4y = 9$ and $y = mx + 1$ is also an integer.

A. 2

B. 0

C. 4

D. 1

Answer: A

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10. The vertical straight line passing through the point of intersection of the straight lines $x - 3y + 1 = 0, 2x + 5y - 9 = 0$ and at a distance of 2 units from the origin has the equation

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

B. $x = 2$

C. $y = 1$

D. $3x + 4y = 10$

Answer: B

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11. The foot of the perpendicular from (-1, 3) on the straight line $5x - y - 18 = 0$ is (α, β) then the quadratic equation in x whose roots are α and β is

A. $x^2 + 6x - 8 = 0$

B. $x^2 + 6x + 8 = 0$

C. $x^2 - 6x - 8 = 0$

D. $x^2 - 6x + 8 = 0$

Answer: D

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Exercise 1 A

1. The equation of the line passing through the point (2, -3) and parallel to the line joining the point (1, 2) and (-1, 5) is

A. $3x + 2y = 0$

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

C. $x - 3y + 6 = 0$

D. $x + 3y + 12 = 0$

Answer: 1

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2. The equation of the line passing through the point $\left(a\cos^3\theta, a\sin^3\theta\right)$ and parallel to $x\cos\theta - y\sin\theta = a$ is

A. $x\cos\theta + y\sin\theta = a\cos 2\theta$

B. $x\cos\theta - y\sin\theta = a\cos 2\theta$

C. $x\sin\theta + y\sin\theta = a\cos 2\theta$

D. none

Answer: 1

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3. The equation of the line perpendicular to the line x = 3 and passing through (-4, 2) is

A. y=2

B. $4x + 5y - 38 = 0$

C. $3x - 2y = 0$

D. $3x - 2y - 1 = 0$

Answer: 1

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4. The equation of the line perpendicular to the line $2x + 3y - 5 = 0$ and passing through (3, -4) is

A. $3x + 2y - 17 = 0$

B. $3x - 2y + 17 = 0$

C. $3x + 2y + 17 = 0$

D. $3x - 2y - 17 = 0$

Answer: 4

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5. If (1, 2), (4, 3), (6, 4) are the midpoints of the sides $\overline{BC}, \overline{CA}, \overline{AB}$ of ΔABC, then the equation of AB is

A. $2x - 3y - 13 = 0$

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

C. $x - 3y + 6 = 0$

D. $x + 3y + 12 = 0$

Answer: 3

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6. If (2, 1), (-1, -2), (3, 3) are midpoints of sides BC, CA, AB of ΔABC, then the equation of AB is

A. $x - y = 1/2$

B. $x + y = 1$

C. $x - y = 9$

D. $x = y$

Answer: 4

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7. Let PS be the median of the triangle with vertices P(2, 2), Q(6, -1) and R(7, 3). The equation of the line passing through (1, -1) and parallel to PS is

A. $4x + 7y + 3 = 0$

B. $2x - 9y - 11 = 0$

C. $4x - 7y - 11 = 0$

D. $2x + 9y + 7 = 0$

Answer: 4

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8. The area of a triangle is 5 square unit. Two of its vertices are (2, 1), (3, -2) and the third vertex lies on the line $y = x + 3$. The third vertex can be

A. $(7/2, 13/2)$

B. $(3/2, 3/2)$

C. $(7/2, -13/2)$

D. $(3/2, -3/2)$

Answer: 1

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9. If t_1, t_2 and t_3 are distinct, the points $\left(t_1, 2at_1 + at_1^3\right), \left(t_2, 2at_2 + at_2^3\right)$ and $\left(t_3, 2at_3 + at_3^3\right)$ are collinear if

A. $t_1t_2t_3 = 1$

B. $t_1 + t_2 + t_3 = t_1t_2t_3$

C. $t_1 + t_2 + t_3 = 0$

D. $t_1 + t_2 + t_3 = -1$

Answer: 3

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10. The medians AD and BE of the triangle with vertices A(0, b), B(0, 0) and C(a, 0) are mutually perpendicular if

A. $b = \sqrt{2}a$

B. $a = \sqrt{2}b$

C. $b = -\sqrt{2}a$

D. $a = -\sqrt{b}$

Answer: 2

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11. If x_1, x_2, x_3 as well as y_1, y_2, y_3 are in G.P with same common ratio, then the points $P(x_1, y_1), Q(x_2, y_2)$ and $R(x_3, y_3)$

A. lie on a straight line

B. lie on an ellipse

C. lie on a circle

D. are vartices of a triangle

Answer: 1

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12. The equation of the line having slope $-4/3$ and x-intercept $-2/5$ is

A. $3x - 4y + 20 = 0$

B. $2x - 3y - 14 = 0$

C. $8x + 12y - 9 = 0$

D. $20x + 15y + 8 = 0$

Answer: D

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13. The equation of the line having slope $-2/3$ and y-intercept $3/4$ is

A. $3x - 4y + 20 = 0$

B. $2x - 3y - 14 = 0$

C. $8x + 12y - 9 = 0$

D. $20x + 15y + 8 = 0$

Answer: 3

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14. The equation of the straight line making an intercept of 3 unit of the y-axis and inclined at 45° to the x-axis is

A. $y = x - 1$

B. $y = x + 3$

C. $y = 45x + 3$

D. $y = x + 45$

Answer: 2

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15. The equation of the line having inclination 120° and y-intercept -3 is

A. $x + y - 5 = 0$

B. $\sqrt{3}x + y + 3 = 0$

C. $x + y - 2 = 0$

D. $x - y - 5 = 0$

Answer: 2

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16. The slope of the line $4x - 5y - 1 = 0$ is

A. $3/2$

B. $-3/2$

C. $-3/4$

D. $4/5$

Answer: 4

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17. The inclination of the line $x - y + 2 = 0$ is

A. $\pi/4$

B. $3\pi/4$

C. $\pi/2$

D. $\pi/3$

Answer: 1

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18. Reduce the equation of the line $8x + 6y - 15 = 0$ into slope intercept form

A. $y = 3x + \frac{5}{3}$

B. $y = \frac{3}{4}x + 2$

C. $y = \frac{5}{2}x + 5$

D. $y = -\frac{4}{3}x + \frac{5}{2}$

Answer: 4

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19. The equation of the line having x-intercept $-3/2$, y-intercept $3/4$ is

A. $3x + 2y - 6 = 0$

B. $2x - 4y + 3 = 0$

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

D. $4x - 3y - 12 = 0$

Answer: 2

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20. The intercepts of the line $3y - 5x + 7 = 0$ are

A. $-2, 3/2$

B. $7/5, \ -7/3$

C. $21/5, 7/2$

D. $2, 4/3$

Answer: 2

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21. The intercepts of line joining the points (4, -7), (1, -5) are

A. $5, 5/3$

B. $7/5, \ -7/3$

C. $5, 7/2$

D. $-13/2, \ -13/3$

Answer: 4

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22. Reduce the equation of the line $2x + 3y - 5 = 0$ into intercepts form

A. $\frac{x}{7} + \frac{y}{7} = 1$

B. $\frac{x}{-7/4} + \frac{y}{7/5} = 1$

C. $\frac{x}{5/2} + \frac{y}{5/3} = 1$

D. $\frac{x}{-3\sqrt{2}} + \frac{y}{-3\sqrt{2}} = 1$

Answer: 3

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23. Reduce the equation of the line $x\cos\alpha + y\sin\alpha - p = 0$ into intercepts form

A. $\frac{x}{p/\sin\alpha} + \frac{y}{p/\cos\alpha} = 1$

B. $\frac{x}{p/\cos\alpha} + \frac{y}{p/\sin\alpha} = 1$

C. $\frac{x}{p/\tan\alpha} + \frac{y}{p/\cot\alpha} = 1$

D. $\frac{x}{p/\cot\alpha}+\frac{y}{p/\tan\alpha}=1$

Answer: 2

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24. The area of the triangle formed by the line $3x+2y+7=0$ with the coordinateaxes is

A. $25/16$ sq. unit

B. $49/8$ sq. unit

C. 12 sq. unit

D. $49/12$ sq. unit

Answer: 4

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25. The area (in square units) of the triangle formed by the lines $x = 0, y = 0$ and $3x + 4y = 12$ is

A. 3

B. 4

C. 6

D. 12

Answer: 3

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26. The area of the triangle formed by the line $x/4 + y/6 = 1$ with the coordinate axes is

A. $25/16$ sq. unit

B. $49/8$ sq. unit

C. 12 sq. unit

D. $49/12$ sq. unit

Answer: 3

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27. The area of the triangle formed by the line $x\cos\alpha + y\sin\alpha = p$ with the coordinate axes is

A. $p^2|\sin 2\alpha|$

B. $p^2|\cos 2\alpha|$

C. $p^2|\sec 2\alpha|$

D. $p^2|\text{cosec}2\alpha|$

Answer: 4

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28. The area of the triangle formed by the line passing through the points (5, -3), (2, 6) with the coordinate axes is

A. 24 sq. unit

B. $49/8$ sq. unit

C. $1/2$ sq. unit

D. $49/12$ sq. unit

Answer: 1

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29. The area of the triangle formed by the axes and the line $\cos h\alpha - \sin h\alpha)x + (\cos h\alpha) + \sin h\alpha) = 2$ in sq. unit, is

A. 4

B. 3

C. 2

D. 1

Answer: 3

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30. If the area of the triangle formed by the lines $x = 0, y = 0, 3x + 4y = a(a > 0)$ is 1, then

A. $\sqrt{6}$

B. $2\sqrt{6}$

C. $4\sqrt{6}$

D. $6\sqrt{2}$

Answer: 2

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31. The sum of the reciprocals of intercepts made by the line $ax + by = a + b$ on the coordinate axes is

A. 2

B. -1

C. $\frac{a-b}{a+b}$

D. 1

Answer: 4

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32. The equation of the line having intercepts a, b on the axes such that $a + b = 5, ab = 6$ is

A. $x + y = 5$

B. $3x + 2y - 6 = 0, 2x + 3y - 6 = 0$

C. $x - 3y - 3 = 0, 3x - y + 3 = 0$

D. $2x + 10y - 5 = 0, 10x + 2y - 5 = 0$

Answer: 2

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33. A line makes intercepts whose sum is 9 and product is 20. If the x-intercept is greater, then the equation of the line is

A. $4x + 5y = 20$

B. $5x + 4y = 20$

C. $5x - 4y = 20$

D. $5x + 4y = -20$

Answer: 1

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34. The equation of the line passing through (2, -1) and having equal intercepts is

A. $x + y - 1 = 0$

B. $x - y + 7 = 0$

C. $x + y + 1 = 0$ or $x + 4y - 2 = 0$

D. $2x + 10y - 5 = 0, 10x + 2y - 5 = 0$

Answer: 1

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35. The equatioin of the line passing through (-4, 3) and having intercepts equal in magnitude but opposite in sign is

A. $x - y - 5 = 0$

B. $x - y + 5 = 0$

C. $x + y - 1 = 0$

D. $x - y + 7 = 0$

Answer: 4

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36. The equation of the straight line passing through the point (4, 3) and making intercepts on the co-ordinate axes whose sum is -1 is

A. $\frac{x}{2} + \frac{y}{3} = -1$ and $\frac{x}{-2} + \frac{y}{1} = -1$

B. $\frac{x}{2} - \frac{y}{3} = 1$ and $\frac{x}{-2} + \frac{y}{1} = 1$

C. $\frac{x}{2} + \frac{y}{3} = 1$ and $\frac{x}{2} + \frac{y}{1} = 1$

D. $\frac{x}{2} - \frac{y}{3} = -1$ and $\frac{x}{-2} + \frac{y}{1} = -1$

Answer: 2

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37. The equation of the line passing through (-2, 1) and having intercepts whose product is 1 is

A. $x + y - 1 = 0$

B. $x - y + 7 = 0$

C. $x + y + 1 = 0$ or $x + 4y - 2 = 0$

D. $2x + 3y = 1$ or $9x - 10y = 75$

Answer: 3

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38. The equation of the line passing through (2, 0) and having intercepts whose ratio is m : n is

A. $nx + my = m$

B. $nx + my = 2n$

C. $nx + my = n$

D. $nx + my = 2m$

Answer: 2

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39. The equation of the line passing through (-4, 3) and having intercepts whose ratio is $5:3$ is

A. $9x + 20y - 96 = 0$

B. $3x + 5y = 3$

C. $9x + 20y + 96 = 0$

D. $9x - 20y - 96 = 0$

Answer: 2

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40. The equation of the line passing through the point P(1, 2) such that P bisects the part intercepted between the axes is

A. $x + 2y = 5$

B. $x - y + 1 = 0$

C. $x + y - 31 = 0$

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

Answer: 4

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41. A straight line through the point A(3, 4) is such that its intercept between the axes is bisected at A. Its equation is

A. $4x + 3y = 24$

B. $3x + 4y = 25$

C. $x + y = 7$

D. $3x - 4y + 7 = 0$

Answer: 1

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42. The portion of a line intercepted between the coordinate axes is bisected by the point (x_1, y_1). The equation of the line is

A. $\frac{x}{x_1} + \frac{y}{y_1} = 0$

B. $\frac{x}{x_1} - \frac{y}{y_1} = 0$

C. $\frac{x}{x_1} + \frac{y}{y_1} = 2$

D. $\frac{x}{x_1} - \frac{y}{y_1} = 2$

Answer: 3

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43. The portion of a line intercepted between the coordinate axes is divided by the point $(2, -1)$ in the ratio $3:2$. The equation of the line is

A. $5x - 2y - 20 = 0$

B. $2x - y + 7 = 0$

C. $3x - 4y - 10 = 0$

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

Answer: 3

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44. The equation of the line whose x-intercept is $2/5$ and which is parallel to $2x - 3y + 5 = 0$ is

A. $2x - 5y + 4 = 0$

B. $10x - 15y - 4 = 0$

C. $28x - 21y + 12 = 0$

D. $20x + 12y + 9 = 0$

Answer: 2

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45. The equation of the line whsoe y-intercept is $-3/4$ and which is parallel to $5x + 3y - 7 = 0$ is

A. $2x - 5y + 4 = 0$

B. $10x - 15y - 4 = 0$

C. $28x - 21y + 12 = 0$

D. $20x + 12y + 9 = 0$

Answer: 4

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46. The equation of the line whose x-intercept is $-3/7$ and which is perpendicular to $3x + 4y - 10 = 0$ is

A. $2x - 5y + 4 = 0$

B. $10x - 15y - 4 = 0$

C. $28x - 21y + 12 = 0$

D. $20x + 12y + 9 = 0$

Answer: 3

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47. The distance between the parallel lines 5x+2y+7=0 and $5x + 2y + 4 = 0$ is

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48. The coordinate axes are roted about the origin O in the counterclockwise direction through an angle 60°. If p and q are the intercepts made on the new axes by a straight line whose equation refered to the original axes is $x + y = 1$ then $1/p^2 + 1/q^2 =$

A. 2

B. 4

C. 6

D. 8

Answer: 1

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49. The sides of a triangle are $3x + 2y - 6 = 0, 2x - 3y + 6 = 0, x + 2y + 2 = 0$. P(0,b) is a point on y-axis. If P lies on the triangle or inside the triangle then the range of b is

A. [-1, 3]

B. [2, 3]

C. [-1, 2]

D. [-2, 2]

Answer: 3

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50. A straight line through the point (2, 2) intersects the lines $\sqrt{3}x + y = 0$ and $\sqrt{3}x - y = 0$ at the points A and B. The equation to the line AB so that the triangle OAB is equilateral is

A. $x - 2 = 0$

B. $y - 2 = 0$

C. $x + y - 4 = 0$

D. none

Answer: 2

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51. A straight line L is perpendicular to the line $5x - y = 1$. The area of the triangle formed by the line L and coordinate axes is 5. The equation of the line L is

A. $x + 5y = \pm 5\sqrt{2}$

B. $x + 5y = \pm 2\sqrt{5}$

C. $5x - y = \pm 5\sqrt{2}$

D. $5x - y = \pm 2\sqrt{5}$

Answer: 1

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52. Each sides of a square is of lemgth 4 units. The centre of the square is $(3, 7)$ and one of its diagonals is parallel to $y = x$. Find the co-ordinates of its vertices.

A. (1, 5), (1, 9), (5, 9), (5, 5)

B. (2, 5), (2, 7), (4, 7), (4, 4)

C. (2, 5), (2, 6), (3, 5), (3, 6)

D. none

Answer: 1

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53. A(-1, 1), B(5, 3) are opposite vertices of a square. The equation of the other diagonal (not passing through A, B) of the square is

A. $2x - 3y + 4 = 0$

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

C. $y + 3x - 8 = 0$

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

Answer: 3

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54. $(-4, 5)$ is a vertex of a square and one of its diagonals is $7x - y + 8 = 0$. Find the equation of a the other diagonal.

A. $x + 7y - 31 = 0$

B. $x + 7y - 15 = 0$

C. $x + 7y + 8 = 0$

D. $7x - y - 31 = 0$

Answer: 1

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55. If $A(1, 1), B(\sqrt{3}+1, 2)$ and $C(\sqrt{3}, \sqrt{3}+2)$ be three vertices of a square, then the diagonal through B is

A. $y = (\sqrt{3}-2)x + (3-\sqrt{3})$

B. $y = 0$

C. $y = x$

D. $y = (\sqrt{3}-2)x + \sqrt{3} + 1$

Answer: 4

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56. In a rhombus ABCD the diagonals AC and BD intersect at the point (3, 4). If the point A is (1, 2) the diagonal BD has the equation

A. $x - y - 1 = 0$

B. $x + y - 1 = 0$

C. $x - y + 1 = 0$

D. $x + y - 7 = 0$

Answer: 4

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57. Points A(1, 3) and C(5, 1) are oppsite vertices of a rectangle ABCD. If the slope of BD is 2, then its equation is

A. $2x - y = 4$

B. $2x + y = 4$

C. $2x + y - 7 = 0$

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

Answer: 1

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58. If the straight lines $y = 4 - 3x, ay = x + 10, 2y + bx + 9 = 0$ represent the three consecutive sides of a rectangle then ab =

A. 18

B. -3

C. $1/2$

D. $-1/3$

Answer: 1

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59. If the lines $y = 4 - 3x, ay = x + 10, 2y + bx + 9 = 0$ form three sides of the rectangle in order and the fourth side passes through (1, -2) then its equation is

A. $x - 3y - 7 = 0$

B. $x - 3y + 7 = 0$

C. $x + 3y - 7 = 0$

D. none

Answer: 1

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60. One side of a rectangle lies along the line $4x + 7y + 5 = 0$. Two of its vertices are (-3, 1) and (1, 1). Then the equations of the other sides are

A. $7x - 4y + 25 = 0, 4x + 7y - 11 = 0, 7x - 4y - 3 = 0$

B. $7x - 4y + 11 = 0, 4x + 7y - 25 = 0, 7x - 4y + 3 = 0$

C. $7x - 4y + 2 = 0, 4x + 7y - 12 = 0, 7x - 4y - 13 = 0$

D. none

Answer: 1

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61. The points (1, 3) and (5, 1) are two opposite vertices of a rectangle. The other two vertices lie on the line $y = 2x + c$. The remaining vertices are

A. (2, 0), (4, 4)

B. (-2, 0), (3, 4)

C. (2, 0), (3, 4)

D. (-2, 0), (4, 4)

Answer: 1

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62. The points (1, 6) and (12, 9) are two opposite vertices of a parallelogram. The other two vertices lie on the line $3y = 11x + k$. Then k =

A. 35

B. 49

C. -35

D. -49

Answer: 4

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63. 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: 3

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64. Let A(2, -3) and B(-2, 1) be vertices of a triangle ABC. If the centroid of this triangle moves on the line $2x + 3y = 1$, then the locus of the vertex C is the line

A. $2x + 3y = 9$

B. $3x - 2y = 3$

C. $3x + 2y = 5$

D. $2x - 3y = 7$

Answer: 1

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65. A(2, 3), B(3, -5) are two vertices of ΔABC. C is a point the line $L \equiv 3x + 4y - 5 = 0$. Then the locus of the centroid of ΔABC is a line parallel to

A. AB

B. BC

C. AC

D. $L = 0$

Answer: 4

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66. The equation of the line dividing the line segment joining the points (1, 1), (2, 4) in the ratio $1:2$ and parallel to $3x - 4y + 5 = 0$ is

A. $x + 2y - 12 = 0$

B. $5x - 2y - 10 = 0$

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

D. $3x - 4y + 4 = 0$

Answer: 4

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67. The equation of the line dividing the line segment joining the points (2, 5), (6, 3) in the ratio $3:4$ externally and parallel to $x+2y+7=0$ is

A. $x+2y-12=0$

B. $5x-2y-10=0$

C. $x+2y-24=0$

D. $3x-4y+4=0$

Answer: 1

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68. The equation of the line dividing the line segment joining the points (2, -3), (1, 2) in the ratio $2:3$ and perpendicular to $2x+5y-1=0$ is

A. $x+2y-12=0$

B. $5x-2y-10=0$

C. $3x - 2y - 24 = 0$

D. $5x - 2y + 4 = 0$

Answer: 2

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69. The equation of the line dividing the line segment joining the points (5, 3), (3, -3) in the ratio $5:3$ externally and perpendicular to $2x + 3y - 5 = 0$ is

A. $x + 2y - 12 = 0$

B. $5x - 2y - 10 = 0$

C. $3x - 2y - 24 = 0$

D. $5x - 2y + 4 = 0$

Answer: 3

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70. The equation of the line dividing the line segments joining two pairs of points (0, 0), (-4, 7) and (2, 3), (4, -5) in the ratio $1:2$ and $5:3$ respectively is

A. $52x + 55y - 59 = 0$

B. $52x - 55y + 59 = 0$

C. $52x + 55y + 59 = 0$

D. $52x - 55y - 59 = 0$

Answer: 1

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71. 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: 3

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72. The equation to the line parallel to $2x + 3y - 5 = 0$ and forming an area $4/3$ sq. unit with the coordinate axes is

A. $2x + 3y \pm 4 = 0$

B. $3x + 2y - 4 = 0$

C. $3x + 2y \pm 4 = 0$

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

Answer: 1

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73. If a straight line perpendicular to $2x - 3y + 7 = 0$ forms a triangle with the coordinate axes whose area is 3 sq. units, then the equation of the straight line(s) is

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

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

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

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

Answer: 2

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

A. $4x + 3y = 12$

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

C. $3x + 4y = 12$

D. $x - 2y = 6$

Answer: 1

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75. The line $4x + 3y + 1 = 0$ cuts the axes at A and B. The equation to the perpendicular bisector of AB is

A. $27x + 63y = 2$

B. $32x - 24y = 5$

C. $24x + 32y = 0$

D. $72x - 96y = 7$

Answer: 4

Watch Video Solution

76. The perpendicular bisector of the line segment joining P(1, 4) and Q(k, 3) has y-intercept -4. Then a possible value of k is

A. 2

B. -2

C. -4

D. 1

Answer: 3

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77. The variable line $x/a + y/b = 1$ is such that $a + b = 10$. The locus of the midpoint of the portion of the line intercepted between theaxes is

A. $x + y = 10$

B. $10x + 5y = 1$

C. $x + y = 5$

D. $5x + 10y = 1$

Answer: 3

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78. The ends of a rod of length l move on two mutually perpendicular lines. The locus of the point on the rod which divides it in the ratio 1 : 2 is

A. $36x^2 + 9y^2 = 4l^2$

B. $36x^2 + 9y^2 = l^2$

C. $9x^2 + 36y^2 = 4l^2$

D. $9x^2 + 36y^2 = l^2$

Answer: 3

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79. If one vertex of an equilateral triangle of side a lies at the origin and the other lies on the line $x = \sqrt{3}y$ then the third vertex is

A. (a, 0)

B. (-a, 0)

C. (0, a)

D. (a, a)

Answer: 3

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80. Two equal sides of isosceles triangle are given by equation $7x - y + 3 = 0$ and $x + y - 3 = 0$. The slope of the thrid side is

A. $-3, 1/3$

B. $3, \ -1/3$

C. $3, 1/3$

D. $-3, \ -1/3$

Answer: 1

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81. Two equal sides of an isoceles triangle are given by 7x-y+3=0 and x+y-3=0 and the third side passes through the point (1,10) then slope m of the third side is given by

A. $3x + y + 7 = 0$

B. $x - 3y + 29 = 0$

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

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

Answer: 4

Watch Video Solution

82. Two equal sides of an isoceles triangle are given by 7x-y+3=0 and x+y-3=0 and the third side passes through the point (1,10) then slope m of the third side is given by

A. $3x + y + 7 = 0$

B. $x - 3y + 29 = 0$

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

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

Answer: 1

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83. The perpendicular form of the line $3x + 4y - 5 = 0$ is

A. $x\cos\alpha + y\sin\alpha = 1$ where $\cos\alpha = 3/5, \sin\alpha = 4/5$

B. $x\cos\alpha - y\sin\alpha = 1$ where $\cos\alpha = 3/5, \sin\alpha = 4/5$

C. $x\cos\alpha + y\sin\alpha = 1$ where $\cos\alpha = 4/5, \sin\alpha = 3/5$

D. $x\cos\alpha - y\sin\alpha = 1$ where $\cos\alpha = 4/5, \sin\alpha = 3/5$

Answer: 1

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84. The locus of the midpoint of the protion of the line $x\cos\alpha + y\sin\alpha = p$ where p is a constant, intercepted between the axes is

A. $p^2\left(x^2 + y^2\right) - 4x^2y^2$

B. $p^2\left(x^2 + y^2\right) - 2x^2y^2$

C. $4\left(x^2 + y^2\right) = p^2x^2y^2$

D. $2\left(x^2 + y^2\right) = p^2x^2y^2$

Answer: 1

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85. The algebraic sum of the perpendicular distances from A, B, C to a variable line is 0. Then the line passes through

A. orthocentre of ΔABC

B. centroid of ΔABC

C. circumcentre of ΔABC

D. incentre of ΔABC

Answer: 2

Watch Video Solution

86. If the algebraic sum of the perpendicular distances from the points (2,0),(0,2),(4,4) to a variable line is equal to zero. Then the line passes through the point.

A. (1, 1)

B. (2, 1)

C. (1, 2)

D. (-1, -1)

Answer: 1

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87. A square of side "a" lies above the x-axis and has one vertex at the origin. The side passing through the origin makes an angle $\alpha \quad \text{where} \quad o < \alpha < \frac{\pi}{4}$ with the positive direction of x-axis, the equation of its diagonal not passing through the origin is

A. $y(\cos\alpha - \sin\alpha) - x(\sin\alpha - \cos\alpha) = a$

B. $y(\cos\alpha + \sin\alpha) + x(\sin\alpha - \cos\alpha) = a$

C. $y(\cos\alpha + \sin\alpha) + x(\sin\alpha + \sin\alpha) = a$

D. $y(\cos\alpha + \sin\alpha) + x(\cos\alpha - \sin\alpha) = a$

Answer: 4

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88. The distance of the point (2,3) from the line $2x - 3y + 9 = 0$ measured along a line $x - y + 1 = 0$ is

A. $\sqrt{2}$

B. 2

C. $2\sqrt{2}$

D. $4\sqrt{2}$

Answer: 4

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89. The distance of the line $3x - y = 0$ from the point (4,1) measured along a line making an angle 135° wih the x-axis is

A. 0

B. $13\sqrt{2}/2$

C. $11\sqrt{2}/4$

D. $7\sqrt{2}/5$

Answer: 3

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90. A line through (2, 3) makes and angle $\pi/4$ with the positive direction of x-axis. The length of the line segment between (2, 3) and the line $x + y - 7 = 0$ is

A. 1

B. 2

C. $\sqrt{2}$

D. $2\sqrt{2}$

Answer: 3

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91. If the straight line through the point P(3,4) makes an angle $\pi/6$ with the x-axis in the positive direction and meets the line $3x + 5y + 1 = 0$ at Q the length PQ is

A. 30

B. $30\left(\sqrt{3} - 1\right)$

C. $\sqrt{3} - 1$

D. $15\left(3\sqrt{30} - 5\sqrt{10}\right)$

Answer: 4

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92. The distance between the parallel lines $4x + 3y + 7 = 0, 12x + 9y + 1 = 0$ is

A. $\frac{2}{3}$

B. $\frac{4}{3}$

C. $\frac{29}{4\sqrt{13}}$

D. $\frac{9}{2\sqrt{5}}$

Answer: 2

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93. The distance between the parallel lines $2x - y + 3 = 0, 2x - y - 4 = 0$ is

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94. The line L given by $\frac{x}{5} + \frac{y}{b} = 1$ passes through the point (13,32). The line K is parallel to L and has the equation $\frac{x}{c} + \frac{y}{3} = 1$. Then the distance between L and K is

A. $\frac{23}{\sqrt{15}}$

B. $\frac{c}{\sqrt{17}}$

C. $\frac{17}{\sqrt{15}}$

D. $\frac{23}{\sqrt{17}}$

Answer: 4

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

A. 4π

B. 3π

C. 2π

D. π

Answer: 4

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96. The lines $x + 2y - 3 = 0, x + 2y + 7 = 0, 2x - y - 4 = 0$ form three sides of two squares. The equation of the fourth side is

A. $2x - y - 14 = 0$ or $2x - y + 6 = 0$

B. $2x - y - 8 = 0$ or $2x - y + 16 = 0$

C. $x - 2y - 14 = 0$ or $x - 2y + 6 = 0$

D. $x + 2y - 14 = 0$ or $x + 2y + 6 = 0$

Answer: 1

View Text Solution

97. The vetices of a triangle are O(0, 0), B(-3, -1), C(-1, -3). The equation of the line parallel to BC and intersecting the sides OB and OC whose perpendicular distance from O is $1/2$ is

A. $x + y = 1/\sqrt{2}$

B. $x + y = -1/\sqrt{2}$

C. $x + y = -1/2$

D. $x + y = 1/2$

Answer: 2

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98. The point on the line $x + y + 3 = 0$ whose distance from $x + 2y + 2 = 0$ is $\sqrt{5}$ is

A. (6, 9)

B. (-6, 9)

C. (9, 6)

D. (-9, 6)

Answer: 4

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99. If p_1, p_2 are the perpendicular distance from the origin to the two perpendicular to each other, then the locus of the point of intersection of the perpendicular lines is

A. $x^2 + y^2 = p_1^2 + p_2^2$

B. $x + y = p_1 + p_2$

C. $x^2 - y^2 = p_1^2 - p_2^2$

D. $x - y = p_1 - p_2$

Answer: 1

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100. The slope of a straight line passing through A(5, 4) is $-5/12$. The points on the line that are 13 unit away from A are

A. (-8, 11), (4, -5)

B. (-7, 9), (17, -1)

C. (7, 5), (-1, 1)

D. (6, 10), (3, 5)

Answer: 2

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101. A line passing through A(1, -2) has slope 1. The points on the line at a distance of $4\sqrt{2}$ unit from A are

A. (3, -6)(5, 2)

B. (-3, -6), (5, -2)

C. (-3, -6), (5, 2)

D. (3, 6), (-5, 2)

Answer: 3

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102. A line is drawn through P(3, 4) inclined at an angle $3\frac{\pi}{4}$ with x-axis. The points on the line on opposite sides of P at distance $\sqrt{2}$ from, it are

A. (2, 5), (4, 3)

B. (-2, -5), (-4, -3)

C. (2, 5), (-4, -3)

D. none

Answer: 1

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103. A line which makes an acute angle θ with the positive dirction of the x-axis is drown through the point P(3,4) to meet the line x=6 at R and y=8 at S. Then.

A. $r^2 \sin^2 \theta + 4r(2 \sin \theta + \cos \theta) + 4 = 0$

B. $r^2 \sin^2 \theta + 4r(2 \sin \theta - \cos \theta) + 4 = 0$

C. $r^2 \sin^2 \theta - 4r(2 \sin \theta + \cos \theta) + 4 = 0$

D. $r^2 \sin^2 \theta - 4r(2 \sin \theta - \cos \theta) + 4 = 0$

Answer: 2

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104. The ratio in which the line y = x divides the segment joining (2, 3) and (8, 6) is

A. $1:2$

B. $1:-2$

C. $1:3$

D. $1:-3$

Answer: 1

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105. The ratio in which the line $3x - 4y + 5 = 0$ divides the line segment joining the points (2, -4), (-3, 1) is

A. $26:9$

B. $27:8$

C. $24:7$

D. $22:6$

Answer: 2

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106. The ratio in which the line joining the points A(-1, -1) and B(2, 1) divides the line joining C(3, 4) and D(1, 2) is

A. $7:5$ internally

B. $7:5$ externally

C. $7:11$ internally

D. $7:11$ externally

Answer: 2

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107. 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: 2

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108. Let $2x - 3y + 1 = 0$ be a line. The points (3, 4), (1, 2) lie in

A. same side of the line

B. origin side of the line

C. opposite sides of the line

D. none

Answer: 1

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109. If the line $3x + 4y = 8$ is denoted by L, then the points (3, -5), (-5, 2)

A. lie on L

B. lie on the same side of L

C. lie on opposite sides of L

D. are equidistant from L

Answer: 2

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110. Which of the following sets of points lie on the negative side, and on the positive side respectively of the line $x - \sqrt{3}y + 1 = 0$?

A. $(3, \sqrt{3}), (3, 3\sqrt{3})$

B. $(3\sqrt{3}, 3), (3, \sqrt{3})$

C. $(3, \sqrt{3}), (\sqrt{3}, \sqrt{3})$

D. $(3, 3\sqrt{3}), (3, \sqrt{3})$

Answer: 4

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111. Let O be the origin A(3, -2), B(1, 2) and C(1, 1). The pair of points which are on different sides of the line $2x + 3y = 5$ are

A. A, B

B. A, C

C. B, C

D. none

Answer: 1

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112. If the points (1, 2) and (3, 4) were to be on the same side of the line $3x - 5y + a = 0$ then

A. $7 < a < 11$

B. $a = 7$

C. $a = 11$

D. $a < 7 \text{ or } a > 11$

Answer: 4

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113. The range of θ in $(0, \pi)$ such that the point (3, 5) and $(\sin\theta, \cos\theta)$ lie on the same side of the line $x + y - 1 = 0$ is

A. $(0, \pi/4)$

B. $(0, \pi/2)$

C. $(\pi/4, 3\pi/4)$

D. $(\pi/2, 3\pi/4)$

Answer: 2

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114. The line segment joining the points (1, 2) and (k, 1) is divided by the line $3x + 4y - 7 = 0$ in the ratio $4:9$, then k is

A. 2

B. -2

C. 3

D. -3

Answer: 2

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115. If the line $2x + y = k$ passes through the point which divides the line segment joining the points (1, 1) and (2, 4) in the ratio $3:2$ then k equals

A. 6

B. $\frac{11}{5}$

C. $29/5$

D. 5

Answer: 1

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116. The vertices of a triangle are (2, 4), (4, -2), (-3, -6). Then the origin lies

A. inside the triangle

B. outside the triangle

C. on one of the triangle

D. none

Answer: 3

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117. Let ABC be a triangle. If P is a point such that AP divides BC in the ratio $2:3$, BP divides CA in the ratio $3:5$ then the ratio in which CP divides AB is

A. $2:5$

B. $2:-5$

C. $5:2$

D. $5:-2$

Answer: 3

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118. A line L cuts the sides AB, BC of ΔABC in the ratio $2:5, 7:4$ respectively then the line L cuts CA in the ratio

A. $7:10$

B. $7:-10$

C. $10:7$

D. $10:-7$

Answer: 4

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119. A straight line through the origin O meets the parallel lines $4x + 2y = 9$ and $2x + y + 6 = 0$ at points P and Q respectively. Then the point O divides the segment PQ in the ratio

A. $1:2$

B. $3:4$

C. $2:1$

D. $4:3$

Answer: 2

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Exercise 1 B

1. The point of intersection of the straight lines $2x + 3y + 4 = 0, 6x - y + 12 = 0$ is

A. (2, -3)

B. (-2, 0)

C. (-2, -1)

D. (-2, 1)

Answer: B

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2. The point of intersection of the diagonals of the quadrilateral with vertices (1, 2), (3, -4), (2, 1), (-1, -2) is

A. $(7/5, 8/5)$

B. $(5/7, 5/8)$

C. $(-7/5, 8/5)$

D. $(-5/7, -8/7)$

Answer: A

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3. If a,b,c form a GP with common ratio r, the sum of the ordinates of the points of intersection of the line ax+by+c=0 and the curve $x + 2y^2 = 0$ is

A. $-\frac{r^2}{2}$

B. $-\frac{r}{2}$

C. $\frac{r}{2}$

D. r

Answer: C

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4. If the lines $7x + 2y - 8 = 0, 2x + y - 1 = 0, 3x + 4y + 6 = 0$ are concurrent, then the point of concurrence is

A. (2, -3)

B. (6, 11)

C. $(78/47, \ -181/47)$

D. $(-13/5, 2/5)$

Answer: A

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

A. (1, 2)

B. (2, 2)

C. (3, 1)

D. (1, 1)

Answer: C

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6. The lines $2x + y - 1 = 0, ax + 3y - 3 = 0, 3x + 2y - 2 = 0$ are cuncurrent

A. for all a

B. for a = 4 only

C. for $-1 \leq a \leq 3$

D. for $a > 0$ only

Answer: A

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7. If the lines $3x + y + 2 = 0, 2x - y + 3 = 0, 2x + ay - 6 = 0$ are concurrent then a =

A. 2

B. 4

C. 6

D. 8

Answer: D

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8. If the lines $4x + 3y - 1 = 0, x - y + 5 = 0$ and $kx + 5y - 3 = 0$ are concurrent, then k =

A. 4

B. 5

C. 6

D. 7

Answer: C

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9. 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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10. The condition that the lines $ax + hy + g = 0, hx + by + f = 0, gx + fy + c = 0$ to be con-current is

A. $a + b + c = 0, f + g + h = 0$

B. $a + b + c = f + g + h$

C. $abc + 2fgh - af^2 - bg^2 - ch^2 = 0$

D. $(a + b + c)(f + g + h) = 0$

Answer: C

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11. The condition that the three different lines $ax + by + c = 0, bx + cy + a = 0, cx + ay + b = 0$ to be concurrent is

A. $a = b = c$

B. $a + b + c = 0$

C. $a + b + c = 0, a = b = c$

D. $a + b + c = 0$ or $a = b = c$

Answer: B

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12. If $a \neq b \neq c$ and if $ax + by + c = 0, bx + cy + a = 0, cx + ay + b = 0$ are concurrent then $2^{a^2b^{-1}c^{-1}}.2^{b^2c^{-1}a^{-1}}2^{c^2a^{-1}b^{-1}} =$

A. 8

B. 0

C. 2

D. none

Answer: A

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13. The condition that the lines $y = m_1x + c_1, y = m_2x + c_2, y = m_3x + c_3$ are concurrent is

A. $m_1(c_2 - c_3) + m_2(c_3 - c_1) + m_3(c_1 - c_2) = 0$

B. $m_1 + m_2 + m_3 = 0$

C. $m_1c_2 - m_2c_3 + c_2m_3 = 0$

D. none

Answer: C

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14. If $t_1 \neq t_2 \neq t_3$ and the lines $t_1x + y = 2at_1 + at_1^3, t_2x + y = 2at_2 + at_2^3, t_3x + y = 2at_3 + at_3^3$ are concurrent then $t_1 + t_2 + t_3$ is

A. 0

B. -1

C. 1

D. none

Answer: A

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15. The equation

$(b-c)x+(c-a)y+a-b=0(b^3-c^3)x+(c^3-a^3)y+a^3-b^3=0$

will represent the same line if

A. $a=b=c$

B. $a+b+c=0$

C. $a/b=c/a$

D. none

Answer: B

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16. If the straight lines $ax+by+c=0$ and $x\cos\alpha+y\sin\alpha=c$, enclose an angle $\pi/4$ between them and meet the straight line $x\sin\alpha-y\cos\alpha=0$ in the same point, then

A. $a^2+b^2=c^2$

B. $a^2 + b^2 = 2$

C. $a^2 + b^2 = 2c^2$

D. $a^2 + b^2 = 4$

Answer: B

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17. If the point of intersection of $kx + 4y + 2 = 0, x - 3y + 5 = 0$ lies on $2x + 7y - 3 = 0$ then k =

A. 2

B. 3

C. -2

D. -3

Answer: B

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

A. A.P

B. G.P

C. H.P

D. A.G.P

Answer: C

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19. If the lines $2x - ay + 1 = 0, 3x - by + 1 = 0, 4x - cy + 1 = 0$ are concurrent, then a, b, c are in

A. A.P

B. G.P

C. H.P

D. A.G.P

Answer: A

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20. If the lines $x + ay = a = 0, bx + y + b = 0, cx + cy + 1 = 0$ (a,b,c being distinct and $\neq 1$) are concurrent, then the value of $\left(\frac{a}{a-1} + \frac{b}{b-1} + \frac{c}{c-1}\right)$ is

A. -1

B. 0

C. 1

D. none

Answer: C

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21. The straight lines $x + 2y - 9 = 0, 3x + 5y - 5 = 0, ax + by + 1 = 0$ are concurrent if the line $22x - 35y + 1 = 0$ passes through the point

A. (a, b)

B. (b, a)

C. (-a, b)

D. (a, -b)

Answer: B

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22. The equation of the line passing through the point of intersection of the lines $2x + 3y - 4 = 0, 3x - y + 5 = 0$ and the origin is

A. $2x + y = 0$

B. $2x + 3y - 4 = 0$

C. $x + 2y + 1 = 0$

D. $2x + y - 12 = 0$

Answer: A

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23. The equation of the line passing through the point of intersection of the lines $2x + y + 1 = 0, x - y - 7 = 0$ and the point (3, -2) is

A. $3x + y = 0$

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

C. $5x + 2y = 0$

D. $3x - y - 11 = 0$

Answer: D

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24. The equation of the line passing through the point of intersection of $2x + 3y = 1, 3x + 4y = 6$ and parallel to $5x - 2y = 7$ is

A. $5x - 2y - 88 = 0$

B. $4x + 3y + 3 = 0$

C. $x - 2y = 0$

D. $2x + y - 5 = 0$

Answer: A

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25. The equation of the line passing through the point of intersection of $5x - 2y = 12, 4x - 7y - 15 = 0$ and parallel to $3x - 2y + 5 = 0$ is

A. $3x + 2y - 8 = 0$

B. $3x - 2y + 8 = 0$

C. $3x - 2y - 8 = 0$

D. $3x + 2y + 8 = 0$

Answer: C

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

A. $x + y = 0$

B. $x + y = 2$

C. $x + y + 2 = 0$

D. $x + y + 1 = 0$

Answer: C

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27. 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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28. 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. $3x + 2y + 1 = 0$

Answer: A

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29. 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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30. The equation of the line passing through the point of the intersection of the lines $x + y - 5 = 0, 2x - y + 4 = 0$ and having intercepts numerically equal is

A. $x + y - 5 = 0$ or $3x - 3y + 13 = 0$

B. $x - y - 5 = 0$ or $3x - 3y + 13 = 0$

C. $x + y - 5 = 0$ or $3x + 3y + 13 = 0$

D. $x + y + 5 = 0$ or $3x - 3y - 13 = 0$

Answer: A

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31. The equation of the straight line passing through the intersection of $x + 2y - 19 = 0, x - 2y - 3 = 0$ and at a distance of 5 unit from (-2, 4) is

A. $5x - 12y - 7 = 0$

B. $5x + 12y + 103 = 0$

C. $5x - 12y + 7 = 0$

D. $12x - 5y + 7 = 0$

Answer: A

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32. The perpendicular distance of the straight line $7x + 24y = 15$ from the point of intersection of the lines $3x + 2y + 4 = 0, 2x + 5y - 1 = 0$ is

A. $1/2$ unit

B. $1/5$ unit

C. $2/3$ unit

D. $3/4$ unit

Answer: B

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33. The vertical straight line passing through the point of intersection of the straight lines $x - 3y + 1 = 0, 2x + 5y - 9 = 0$ and at a distance of 2 units from the origin has the equation

A. $x = 2$

B. $3x + 4y - 10 = 0$

C. $y = 1$

D. none

Answer: B

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34. The locus of the point of intersection of the lines $x\cos\alpha + y\sin\alpha = a$ and $x\sin\alpha - y\cos\alpha = b$, where α is a parameter is

A. $x^2 - y^2 = a^2 + b^2$

B. $x^2 + y^2 = a^2 + b^2$

C. $x^2 + y^2 = a^2 - b^2$

D. $x^2 - y^2 = a^2 - b^2$

Answer: B

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35. A variable line drawn throgh the point of intersection of the lines $\frac{x}{a} + \frac{y}{b} = 1, \frac{x}{b} + \frac{y}{a} = 1$ meets the coordinate axes in A and B. Then the locus of midpoint of AB is

A. $2xy(a+b) = ab(x+y)$

B. $xy(a+b) = ab(x+y)$

C. $2xy(a+b) = ab(x-y)$

D. $xy(a+b) = ab(x-y)$

Answer: A

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36. Let a and be nonzero reals such that $a \neq b$. Then the equation of the line passing through the origin and the point of intersection of $x/a + y/b = 1$ and $x/b + y/a = 1$ is

A. $ax + by = 0$

B. $bx + ay = 0$

C. $y - x = 0$

D. $x + y = 0$

Answer: C

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37. The equation to the line passing through the intersection of $\frac{x}{b}+\frac{y}{b}=1, \frac{x}{b}+\frac{y}{a}=1$ where $ab=a+b$ and (1, 2) is

A. x = 1

B. x = 2

C. y = 1

D. y = 2

Answer: A

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

A. $3 + \sqrt{2}$

B. $\sqrt{2} - 1$

C. 1

D. 0

Answer: B

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39. The point of concurrence of the lines $(3k + 1)x - (2k + 3)y + (9 - k) = 0$ is

A. (1, 1)

B. (1, -1)

C. (3, 4)

D. (-2, 1)

Answer: C

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40. The point of concurrence of the lines $(a+2b)x+(a-b)y+(a+5b)=0$ is

A. (-1, 2)

B. (2, -1)

C. (-2, 1)

D. (1, -2)

Answer: C

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41. The point of concurrence of the lines $(2a+5b)x+(3a-2b)y-5a-3b=0$ is

A. $(1, 1)$

B. (1, -1)

C. (2, 2)

D. (-2, 2)

Answer: A

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42. If $'\theta'$ is the parameter, then the family of lines $(2\cos\theta + 3\sin\theta)x + (3\cos\theta - 5\sin\theta)y - (5\cos\theta - 2\sin\theta) = 0$ pass through the fixed point

A. (0, 0)

B. (1, 1)

C. (0, 1)

D. (1, 0)

Answer: B

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43. If a, b, c are in A.P, the lines $ax + by + c = 0$ pass through the fixed point

A. (1, 2)

B. (-1, 2)

C. (1, -2)

D. (-1, -2)

Answer: C

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44. If a, b, c are in A.P, then the lines $ax + by + c = 0$

A. pass through a fixed point

B. form an equilateral triangle

C. form a rhombus

D. form a square

Answer: A

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45. If $3a + 2b + 4c = 0$ then the lines $ax + by + c = 0$ pass through the fixed point

A. $(3/4, 1/2)$

B. $(-3/4, 1/2)$

C. $(3/4, -1/2)$

D. $(-3/4, -1/2)$

Answer: A

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46. If $4a^2 + 9b^2 - c^2 + 12ab = 0$, then the set of lines $ax + by + c = 0$ pass through the fixed point

A. (1, 2), (-1, -2)

B. (2, 3), (-2, -3)

C. (2, -3), (-2, 3)

D. (1, -2), (-1, 2)

Answer: B

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47. k is a nonzero constant. If $k = \frac{a+b}{ab}$ then the straight line $\frac{x}{a} + \frac{y}{b} = 1$ passes through the point

A. (k, k)

B. $(1/k, 1/k)$

C. (1, 1)

D. $(k, 1/k)$

Answer: B

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48. The equations of the sides $\overline{BC}, \overline{CA}, \overline{AB}$ of a triangle ABC are $u_1 = a_1x + b_1y + c_1 = 0, u_2 = a_2x + b_2y + c_2 = 0$ and $u_3 = a_3x + b_3y + c_3 = 0$ respectively. The equation of the line parallel to $\overline{BC}$ and passing through A is

A. $(a_3b + a_1b_3)u_2 = (a_2b_1 - a_1b_2)u_3$

B. $(a_3b_1 - a_1b_3)u_2 = (a_2b_1 + a_1b_2)u_3$

C. $(a_3b_1 + a_1b_3)u_2 = (a_2b_1 + a_1b_2)u_3$

D. $(a_3b_1 - a_1b_3)u_2 = (a_2b_1 - a_1b_2)u_3$

Answer: D

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49. The lines $2x + 3y = 6, 2x + 3y = 8$ cut the X-axis at A, B respectively. A line l drawn through the point (2, 2) meets the X-axis at C in such a way that abscissae of A, B and C are in arithmetic progression. Then the equation of the line l is

A. $2x + 3y = 10$

B. $3x + 2y = 10$

C. $2x - 3y = 10$

D. $3x - 2y = 10$

Answer: A

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50. The number of lines that can be drawn through the point (-3, 4) at a distance of 5 units from the point (2, -8) is

A. 0

B. 1

C. 2

D. infinite

Answer: C

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51. The number of lines that can be drawn through the point (5,2) at a distance of 5 units from the pont (2,-2) is

A. 0

B. 1

C. 2

D. infinite

Answer: B

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52. The number of lines that can be drawn through the point $\left(4, \sqrt{13}\right)$ at a distance of 3 units from the point (-2, 0) is

A. 0

B. 1

C. 2

D. infinite

Answer: C

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53. The number of lines that can be drawn through the point (4, -5) at a distance of 10 units from the point (1, 3) is

A. 0

B. 1

C. 2

D. infinite

Answer: A

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54. The centroid of the triangle formed by the lines $x + y - 1 = 0, x - y - 1 = 0, x - 3y + 3 = 0$ is

A. $(4/3, 1)$

B. $(-4/3, 1)$

C. $(8/3, 3)$

D. $(-8/3, 3)$

Answer: A

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

A. (-2, 2)

B. (4, 1)

C. (1, -1)

D. (4, 6)

Answer: B

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56. 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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57. Let a, b, c and d be non-zero numbers. If the point of intersection of the lines $4ax + 2ay + c = 0$ and $5bx + 2by + d = 0$ lies in the fourth quadrant and is equidistant from the two axes then

A. $3bc - 2ad = 0$

B. $3bc + 2ad = 0$

C. $2bc - 3ad = 0$

D. $2bc + 3ad = 0$

Answer: A

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58. The circumcentre of a triangle with vertices (-2, 3), (2, -1), (4, 0) is

A. $\left(\frac{3}{2}, \frac{5}{2}\right)$

B. $\left(\frac{3}{2}, -\frac{5}{2}\right)$

C. $\left(-\frac{3}{2}, \frac{5}{2}\right)$

D. $\left(-\frac{3}{2}, -\frac{5}{2}\right)$

Answer: A

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59. The circumcentre of the triangle passing through $(1, \sqrt{3}), (1, -\sqrt{3}), (3, -\sqrt{3})$ is

A. (2, 0)

B. (1, 0)

C. $(2, \sqrt{3})$

D. (0, 2)

Answer: A

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60. Find the circumcentre of the triangle whose sides are $3x - y - 5 = 0, x + 2y - 4 = 0$ and $5x + 3y + 1 = 0$.

A. $\left(\frac{6}{7}, \frac{2}{7}\right)$

B. $\left(\frac{6}{7}, -\frac{2}{7}\right)$

C. $\left(-\frac{6}{7}, \frac{2}{7}\right)$

D. $\left(-\frac{6}{7}, -\frac{2}{7}\right)$

Answer: C

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61. The circumcentre of the triangle formed by the lines $3x - y - 5 = 0, x + 3y - 5 = 0, x = y$ is

A. $(2, 1)$

B. $(5/2, 5/2)$

C. $(5/4, 5/4)$

D. $(15/8, 15/8)$

Answer: D

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62. The incentre and excentres of the triangle formed by the lines $x = 0, y = 0, 3x + 4y = 2$ are

A. $(0, 2), (-2\sqrt{3}, 0), (0, 6), (2\sqrt{3}, 0)$

B. $(1, 8), (15, 120), (40, -5), (-24, 3)$

C. $(1, 1), (3, -3), (6, 6), (-2, 2)$

D. $(-2, 2), (1, 8), (0, 6), (2\sqrt{3}, 0)$

Answer: C

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63. The incentre and excentres of the triangle formed by the lines $3x + 4y = 0, 5x - 12y = 0, y = 15$ are

A. $(0, 2), (-2\sqrt{3}, 0), (0, 6), (2\sqrt{3}, 0)$

B. $(1, 8), (15, 120), (40, -5), (-24, 3)$

C. $(1, 1), (3, -3), (6, 6), (-2, 2)$

D. $(-2, 2), (1, 8), (0, 6), (2\sqrt{3}, 0)$

Answer: B

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64. The 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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65. The point equidistant to the lines $4x+3y+10=0, 5x-12y+26=0, 7x+24y-50=10$ is

A. (1, -1)

B. (1, 1)

C. (0, 0)

D. (0, 1)

Answer: C

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66. The orthocentre of the triangle formed by (1, 0), (2, -4), (-5, -2) is

A. $\left(\frac{11}{13}, \frac{7}{13}\right)$

B. $\left(\frac{11}{13}, -\frac{7}{13}\right)$

C. $\left(-\frac{11}{13}, \frac{7}{13}\right)$

D. $\left(-\frac{11}{13}, -\frac{7}{13}\right)$

Answer: B

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67. The orthocentre of the triangle formed by (0, 0), (3, 1), (1, 3) is

A. $(3/2, 3/2)$

B. $(2/5, 3/5)$

C. $(4, 8/3)$

D. $(24, -26)$

Answer: A

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68. The orthocentre of the triangle formed by (1,-3),(6,1),(4,-1) is

A. $(3/2, 3/2)$

B. (-3, 2)

C. $(4, 8/3)$

D. (24, -26)

Answer: D

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69. The orthocentre of the triangle formed by $(2, -1/2), (1/2, -1/2)$ and $\left(2, \left(\sqrt{3}-1\right)/2\right)$ is

A. $\left(\frac{3}{2}, \frac{\sqrt{3}-3}{6}\right)$

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

C. $\left(\frac{5}{4}, \frac{\sqrt{3}-2}{4}\right)$

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

Answer: B

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70. The orthocentre of the triangle formed by the lines $x-2y+9=0, x+y-9=0, 2x-y-9=0$ is

A. (5, 5)

B. (5, -5)

C. (-5, 5)

D. (-5, -5)

Answer: A

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71. The orthocentre of the triangle formed by the lines $x + y = 6, 2x + y = 4, x + 2y = 5$ is

A. (11, 10)

B. (11, -10)

C. (-11, 10)

D. (-11, -10)

Answer: D

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72. Find the orthocentre of the triangle whose sides are

$4x - 7y + 10 = 0, x + y = 6$ and $7x + 4y = 15$

A. (1, 2)

B. (1, -2)

C. (-1, 2)

D. (-1, -2)

Answer: A

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73. The coordinates of the orthocentre formed by the lines $y = m_i x + \frac{a}{m_i}, i = 1, 2, 3$ are

A. (-a, 0)

B. (0, -a)

C. $\left(-a, a\left[\frac{1}{m_1} + \frac{1}{m_2} + \frac{1}{m_3} + \frac{1}{m_1 m_2 m_3} \right] \right)$

D. none

Answer: C

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74. The equations to the sides of a triangle are $x - 3y = 0, 4x + 3y + 5, 3x + y = 0$. The line $3x - 4y = 0$ passes throuth

A. the incentre

B. the centroid

C. the circumcentre

D. the orthocentre of the triangle

Answer: D

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

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76. If P, Q, R lie on $xy = c^2$, then the orthocentre of ΔPQR lies on

A. $x + y = 0$

B. $2x + 3y = c$

C. $xy = c^2$

D. none

Answer: C

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77. If the orthocentre of the triangle formed by the lines $2x + 3y - 1 = 0, x + 2y - 1 = 0, ax + by - 1 = 0$ is at the origin,

then (a, b) is given by

A. (6, 4)

B. (-3, 3)

C. (-8, 8)

D. (0, 7)

Answer: C

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78. Let $P(-1, 0), Q(0, 0)$ and $R(3, 3\sqrt{3})$ be three points. The equation of the bisector of the angle PQR is

A. $\sqrt{3} + y = 0$

B. $x + \frac{\sqrt{3}}{2}y = 0$

C. $\frac{\sqrt{3}}{2}x + y = 0$

D. $x + \sqrt{3}y = 0$

Answer: A

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79. The base of an equilateral triangle x + y = 2 = 0 and opposite vertex is (2 , - 1). Find the equations of the remaining sides .

A. $y+1=\left(2\pm\sqrt{3}\right)(x+2)$

B. $y-1=\left(2\pm\sqrt{3}\right)(x-2)$

C. $y+1=\left(2\pm\sqrt{3}\right)(x-2)$

D. $y+1=\left(\sqrt{3}\pm1\right)(x-2)$

Answer: C

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80. The ends of the base of an isoceles triangle are at (2a, 0) and (0, a). The equation of one side is $x=2a$. The equation of the other side is

A. $x + y = a$

B. $x + 2y = a$

C. $x + 2y = 2a$

D. $2x + y = 2a$

Answer: C

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81. The area of the triangle formed by the lines $2x + y - 4 = 0, 3x + 2y - 5 = 0, x + y + 1 = 0$ is

A. 2

B. 4

C. 6

D. 8

Answer: A

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82. The line 3x+2y=24 meets the y-axis at A and the x-axis at B. The perpendicular bisector of AB meets the line through (0,-1) parallel to the x-axis at C. If the area of triangle ABC is A, then the Value of $A/13$ is

---

A. 85

B. 87

C. 90

D. 91

Answer: D

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83. The line 3x+2y=24 meets the y-axis at A and the x-axis at B. The perpendicular bisector of AB meets the line through (0,-1) parallel to the

x-axis at C. If the area of triangle ABC is A, then the Value of $A/13$ is

---

A. 81

B. 91

C. 71

D. 61

Answer: B

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84. The are of the triangle formed by the y-axis, the line L passing through the point (1, 1) and (2, 0) and the straight line perpendicular to the line L and passing through $(1/2, 0)$ is

A. $25/19$

B. $25/16$

C. $23/16$

D. $23/19$

Answer: B

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85. A line meets the coordinate axes at A and B such that the centroid of ΔOAB is (1, 2) . The equation of the line AB is

A. $x + y = 6$

B. $2x + y = 6$

C. $x + 2y = 6$

D. none

Answer: B

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86. Let $P(-1, 0), Q(0, 0)$ and $R(3, 3\sqrt{3})$ be three points. The equation of the bisector of the angle PQR is

A. $\sqrt{3}x + 2y = 0$

B. $x + \sqrt{3}y = 0$

C. $\sqrt{3}x + y = 0$

D. $2x + \sqrt{3}y = 0$

Answer: C

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87. In ΔABC, if B = (1, 2), C = (5, 6) and the internal bisector of the angle at A cuts BC at D(4, 5) then $AB : AC =$

A. $2:1$

B. $3:1$

C. $1:3$

D. $1:2$

Answer: B

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88. In a triangle ABC, if A-=(1,2) and the internal angle bisectors through B and C are y=x and y=-2x, then the inradius r of ΔABC is

A. (7, 2), (4, 2)

B. (7, -2), (4, 3)

C. (5, 2), (4, 3)

D. none

Answer: B

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89. The base of a triangle lies along the line x=a and is of length a. The area of the triangle is a^2. The locus of the third vertex is

A. $x = 0$

B. $x = -a$

C. $x = a/2$

D. $x = a$

Answer: B

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90. A(1, 0), B(0, 1) are two points. If P(x, y) is a point such that $xy > 0$ and $x + y < 1$ then

A. P lies either inside ΔOAB or in third quadrant

B. P can not be inside ΔOAB

C. P lies inside the ΔOAB

D. none

Answer: A

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91. The quadrilateral formed by the lines $x + 8y + 37 = 0, 7x - 6y + 11 = 0, x + 8y - 87 = 0, 7x - 6y - 51 = 0$ is

A. parallelogram

B. rectangle

C. rhombus

D. square

Answer: A

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92. The lines $2x + y = 1, x + 2y = 1, 2x + y = 3, x + 2y = 3$ form

A. parallelogram

B. rectangle

C. rhombus

D. square

Answer: C

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93. The quadrilateral formed by the lines $x - y + 2 = 0, x + y = 0, x - y - 4 = 0, x + y - 12 = 0$ is

A. parallelogram

B. rectangle

C. rhombus

D. square

Answer: B

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94. The quadrilateral formed by the lines $x+y-3=0, x-y+3=0, x+y+1=0, x-y-1=0$ is

A. parallelogram

B. rectangle

C. rhombus

D. square

Answer: D

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95. The quadrilateral formed by the lines $\sqrt{3}x+y=0, \sqrt{3}y+x=0, \sqrt{3}x+y=1, \sqrt{3}y+x=1$ is

A. rectangle

B. square

C. rhombus

D. none

Answer: C

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96. The are of the quadrilateral formed by the lines $x - y + 2 = 0, x + y = 0, x - y - 4 = 0, x + y - 12 = 0$ is

A. 36

B. 52

C. 8

D. 124

Answer: A

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97. A : The area of the parallelogram formed by $4x - 7y - 13 = 0, 8x - y - 39 = 0, 4x - 7y + 39 = 0, 8x - y + 13 = 0$ is 52.

R : The area of the parallelogram formed by $a_1x + b_1y + c_1 = 0, a_1x + b_1y + d_1 = 0, a_2x + b_2y + c_2 = 0, a_2x + b_2y +$ is $\left|\frac{(c_1 - d_1)(c_2 - d_2)}{a_1b_2 - a_2b_1}\right|$

A. 36

B. 52

C. 8

D. 124

Answer: B

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98. The area of the quadrilateral formed by the lines $a|x| + b|y| + c = 0$ is

A. $\frac{2c^2}{ab^2}$

B. $\frac{2c^2}{ab}$

C. $\frac{2c}{a^2b}$

D. $\frac{2c}{ab^2}$

Answer: B

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99. Find the area enclosed with in the curve

$|x| + |y| = 1$

A. 2

B. $1/2$

C. 1

D. 4

Answer: A

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100. The area of the parallelogram formed by the lines $4y - 3x - a = 0, 3y - 4x + a = 0, 4y - 3x - 3a = 0, 3y - 4x + 2a = 0$ is

A. $a^2/5$

B. $a^2/7$

C. $2a^2/7$

D. $2a^2/9$

Answer: C

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101. P(2, 1), Q(4, -1), R(3, 2) are the vertices of a triangle and if through P and R lines parallel to opposites sides are drawn to intersect in S, then the area of PQRS is

A. 6

B. 4

C. 8

D. 12

Answer: B

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102. 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. $25/4$

B. 25

C. 50

D. 100

Answer: C

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103. The angle between the lines $4x - y + 9 = 0, 25x + 15y + 27 = 0$ is

A. $\pi / 2$

B. $\pi / 4$

C. 0

D. $\pi / 6$

Answer: B

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104. The angle between the lines $x\cos\alpha + y\sin\alpha = p_1$ and $x\cos\beta + y\sin\beta = p_2$ where $\alpha > \beta$ is

A. $\alpha + \beta$

B. $\alpha - \beta$

C. $\alpha\beta$

D. $2\alpha - \beta$

Answer: B

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105. The angle between the lines formed by joining the points (2, -3), (-5, 1) and (7, -1), (0, 3) is

A. $\pi/2$

B. $\pi/4$

C. 0

D. $\pi/6$

Answer: C

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106. Find the angle between the lines $ax + by = a + b, a(x - y) + b(x + y) = 2b$

A. $\pi/2$

B. $\pi/4$

C. 1

D. $\pi/6$

Answer: B

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107. If θ is the angle between the lines $x/a + y/b = 1, x/b + y/a = 1$, then $\cos\theta =$

A. $\frac{2ab}{a^2 + b^2}$

B. $\frac{ab}{a^2 + b^2}$

C. $\frac{a^2 + b^2}{2ab}$

D. $\frac{a^2 + b^2}{ab}$

Answer: A

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108. If θ is the angle between $y = 2x + 3, y = x + 1$, the value of $\tan\theta =$

A. $21/5$

B. $1/3$

C. $5/3$

D. -2

Answer: B

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109. 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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110. If the acute angle between the lines $4x - y + 7 = 0, kx + 5y - 9 = 0$ is 45°, then the value of k is

A. $-3, 25/3$

B. $1, \ -4$

C. 2 or $-1/2$

D. 5 or $2/3$

Answer: A

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111. If the acute angle between the lines $2x + 3y - 5 = 0, 5x + ky - 6 = 0$ is $\pi/4$, then k =

A. 1

B. 2

C. -1

D. -2

Answer: A

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112. If $2x + ky - 10 = 0, 5x + 2y - 7 = 0$ are parallel, then the value of k =

A. $4/3$

B. $4/5$

C. $5/3$

D. 6

Answer: B

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113. If $3x - ky - 2 = 0, 2x + y + 2 = 0$ are perpendicular, then the value of k =

A. $4/3$

B. $4/5$

C. $5/3$

D. 6

Answer: D

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114. A line passing through the points (a, 2a) and (-2, 3) is perpendicular to the line $4x + 3y + 5 = 0$, then the value of a is

A. $18/5$

B. 18

C. 5

D. 1

Answer: A

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115. The value of k such that the straight line $(2x + 3y + 5) + k(x - 7y + 6) = 0$ is parallel to x-axis is

A. $21/5$

B. $1/3$

C. $5/3$

D. -2

Answer: D

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116. The value of k such that the line $3x + 4y + 5 - k(x + y + 3) = 0$ is parallel to y-axis is

A. 1

B. 2

C. 3

D. 4

Answer: D

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117. The value of k such that the straight line $3x + 14y + 7 + k(5x + 7y + 6) = 0$ is perpendicular to x-axis is

A. $21/5$

B. $1/3$

C. $5/3$

D. -2

Answer: D

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118. The value of k such that the line $2x + 3y + 4 + k(6x - y + 12) = 0$ is perpendicular to the line $7x + 5y = c$ is

A. $29/37$

B. $-29/37$

C. $-27/37$

D. $-28/37$

Answer: B

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119. The lines $p(p^2+1)x - y + q = 0$ and $(p^2+1)^2 x + (p^2+1)y + 2q = 0$ are perpendicular to a common line for

A. exactly one value of p

B. exactly two values of p

C. more than two values of p

D. no value of p

Answer: A

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120. If the straight liine $a(x+y-1) + b(2x-3y+1) = 0$ for different values of a and b are parallel to y-axis then the relationship between a & b is

A. $b = 3a$

B. $a = 3b$

C. $a + 3b = 0$

D. $b + 3a = 0$

Answer: B

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121. The diagonals of the parallelogrma formed by the lines $a_1x + b_1y + c_1 = 0, a_1x + b_1y + c_1^1 = 0, a_2x + b_2y + c_1 = 0, a_2x + b_2 + c_1^1$ will be right angles if

A. $\frac{a_1}{a_2} = \frac{b_1}{b_2}$

B. $\frac{a_1^2}{b_1^2} = \frac{a_2^2}{b_2^2}$

C. $a_1^2 + b_1^2 + b_2^2$

D. none

Answer: D

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122. The diagonals of the parallelogram whose sides are $lx + my + n = 0, lx + my + n_1 = 0, mx + ly + n = 0, mx + ly = n_1 =$ include an angle

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

B. $\frac{\pi}{2}$

C. $\tan^{-1}\left(\frac{l^2 - m^2}{l^2 + m^2}\right)$

D. $\tan^{-1}\left(\frac{2lm}{l^2 + m^2}\right)$

Answer: B

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123. The angle between the diagonals of the parallelogram formed by the lines $\frac{x}{a} + \frac{y}{b} = 1, \frac{x}{b} + \frac{y}{a} = 1, \frac{x}{a} + \frac{y}{b} = 2, \frac{x}{b} + \frac{y}{a} = 2$ is

A. $\pi/6$

B. $\pi/4$

C. $\pi/3$

D. $\pi/2$

Answer: D

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124. The angles of the triangle formed by the lines $5x + 3y - 15 = 0, x + y - 4 = 0, 2x + y - 6 = 0$ is

A. $\cos^{-1}\left(\frac{4}{\sqrt{17}}\right), \cos^{-1}\left(\frac{13}{\sqrt{170}}\right), \pi + \cos^{-1}\left(\frac{3}{\sqrt{10}}\right)$

B. $\cos^{-1}\left(\frac{4}{\sqrt{17}}\right), \cos^{-1}\left(\frac{13}{\sqrt{170}}\right), \pi - \cos^{-1}\left(\frac{3}{\sqrt{10}}\right)$

C. $\cos^{-1}\left(\frac{2}{\sqrt{5}}\right), \frac{\pi}{2}, \frac{\pi}{2} - \cos^{-1}\left(\frac{2}{\sqrt{5}}\right)$

D. $\cos^{-1}\left(\frac{2}{\sqrt{5}}\right), \frac{\pi}{2}, \frac{\pi}{2} + \cos^{-1}\left(\frac{2}{\sqrt{5}}\right)$

Answer: B

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125. The lines $(a+b)x+(a-b)y=2ab$, $(a-b)x+(a+b)y=2ab$, and $x+y=0$ form an isosceles triangles whose vertical angle is

A. 0

B. $\pi/4$

C. $2\tan^{-1}(a/b)$

D. $2\tan^{-1}\left(2ab/\left(a^2-b^2\right)\right)$

Answer: C

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126. Show that the straight lines $(a-b)x+(b-c)y=c-a$, $(b-c)x+(c-a)y=a-b$ and $(c-a)x+(a-b)y=b-c$ are concurrent.

A. form an equilateral triangle

B. are concurrent

C. form an isosceles triangle

D. right angled triangle

Answer: B

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127. Show that the lines $x - 7y - 22 = 0, 3x + 4y + 9 = 0$ and $7x + y - 54 = 0$ form a right angled isosceles triangle.

A. form an equilateral triangle

B. are concurrent

C. form an isosceles triangle

D. form a right angled isosceles triangle

Answer: D

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128. The lines $2x - y - 1 = 0, 3x - y - 7 = 0, 3x - 2y + 4 = 0$

A. form an equilateral triangle

B. are concurrent

C. form an isosceles triangle

D. form a right angled isosceles triangle

Answer: B

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129. The straight lines $2x + 3y = 5$ and $6x - 4y + k = 0, k \in R$ are the sides of [if the third line is not parallel any of these two lines]

A. an equilateral triangle

B. right angled triangle

C. obtuse angled triangle

D. can not be the sides of a triangle

Answer: B

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130. The equation of the line passing through (1, 1) and makes an angle $\pi/4$ with the line $2x - y + 7 = 0$ is

A. $3x + y + 4 = 0$

B. $3x - y + 4 = 0$

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

D. $3x - y - 4 = 0$

Answer: C

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131. 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. $x + y = 3$

D. $x - y + 1 = 0$

Answer: B

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132. The equations of the lines passing through (-10, 4) and making an angle $\tan^{-1} 2$ with the line $2y = x - 10$ are

A. $3x + 4y + 14 = 0, x + 10 = 0$

B. $3x + 4y - 14 = 0, x + 10 = 0$

C. $3x - 4y + 14 = 0, x + 10 = 0$

D. $3x - 4y - 14 = 0, x + 10 = 0$

Answer: A

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133. The equation of the straight line through the origin, whose intercept between the lines $5x + 12y = 15$ and $5x + 12y = 30$ is equal to 3 is

A. x =10

B. y = 0

C. x = 3

D. y = 3

Answer: B

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134. The equation of a straight line passing through (1, 2) and having intercept of length 3 between the straight lines $3x + 4y = 24$ and $3x + 4y = 12$ is

A. $7x + 24y - 55 = 0$

B. $24x + 7y - 38 = 0$

C. $24x - 7y - 10 = 0$

D. $7x - 24y + 41 = 0$

Answer: D

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135. The equations of the lines passing through (4, 5) and making equal angles with the lines $3x = 4y + 7, 5y = 12x + 6$ are

A. $y + 2 = 0, \sqrt{3}x - y = 2 + 3\sqrt{3}$

B. $3x + y - 4 = 0, x - 3y + 2 = 0$

C. $9x - 7y = 1, 7x + 9y = 73$

D. none of these

Answer: C

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136. ABCD is a parallelogram. Equations of $\overleftrightarrow{AB}$ and $\overleftrightarrow{AD}$ are $4x + 5y = 0, 7x + 2y = 0$ and the equation of the diagonal $\overleftrightarrow{BD}$ is $11x + 7y = 9$. Then the equation of $\overleftrightarrow{AC}$ is

A. $x = y$

B. $x + y = 0$

C. $7x - 11y = 0$

D. $7x + 11y = 0$

Answer: A

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137. The equation to the diagonal through the origin of the quadrilateral formed by $x = 0, y = 0, x + y = 1$ and $6x + y = 3$ is

A. $x + 3y = 2$

B. $2x + 5y = 3$

C. $3x - 2y = 0$

D. $3x + 2y = 2$

Answer: C

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138. The points A(1,2),B(3,-4) are two vertices of the rectangle ABCD. The point P(3,8) lies on the CD produced then C=

A. $\left(\frac{33}{5}, \frac{14}{5}\right)$

B. $\left(-\frac{33}{5}, \frac{14}{5}\right)$

C. $\left(\frac{33}{5}, -\frac{14}{5}\right)$

D. $\left(-\frac{33}{5}, -\frac{14}{5}\right)$

Answer: C

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139. The diagonal of a square is 8x- 15y =0 and one vertex of the square is (1, 2). The equations to the sides of the square passing through this vertex are

A. $22x + 8y = 9, 22x - 8y = 52$

B. $23x + 7y = 9, 7x - 23y = 52$

C. $23x - 7y = 9, 7x + 23y = 53$

D. none

Answer: C

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140. If the opposite vertices of a square are (-2, 3) and (8, 5), then the equations of the sides of that square are

A.

$$3x - 2y + 12 = 0, 3x + 2y - 14 = 0, 2x - 3y + 51 = 0, 2x + 3y - 3$$

B.

$$3x - 2y + 12 = 0, 3x - 2y + 14 = 0, 2x + 3y - 51 = 0, 2x + 3y - 3$$

C.

$$3x - 2y + 12 = 0, 3x + 2y + 14 = 0, 2x - 3y + 51 = 0, 2x + 3y - 3$$

D.

$$3x - 2y + 12 = 0, 3x - 2y - 14 = 0, 2x + 3y - 5 = 0, 2x + 3y - 31$$

Answer: D

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141. The ends of the base of an isoceles triangle are at (2a, 0) and (0, a). The equation of one side is $x = 2a$. The equation of the other side is

A. $x + 2y - a = 0$

B. $x + 2y = 2a$

C. $3x + 4y - 4a = 0$

D. $3x - 4y + 4a = 0$

Answer: D

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142. The foot of the perpendicular of the point (3, -5) in y-axis is

A. (2, 0)

B. (0, -5)

C. (7, -4)

D. (-2, -3)

Answer: B

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143. The foot of the perpendicular of the point (-2, 5) in $y + 3 = 0$ is

A. (2, 0)

B. (0, -5)

C. (7, -4)

D. (-2, -3)

Answer: D

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144. If (2, -3) is the foot of the perpendicular from (-4, 5) on a line, then the equation of the line is

A. $3x + 4y = 18$

B. $3x - 4y = 18$

C. $3x + 4y = 20$

D. $3x - 4y = 20$

Answer: B

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145. If PM is the perpendicular from $P(2, 3)$ on to the lie $x + y = 3$ the M=

A. (2, 1)

B. (-1, 4)

C. (1, 2)

D. (4, -1)

Answer: C

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146. 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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147. A : The foot of the perpendicular from (3, 4) on the line $3x - 4y + 5 = 0$ is $(81/25, 92/25)$

R : If (h, k) is the foot of the perpendicular from (x_1, y_1) to the line $ax + by + c = 0$ then $\frac{h - x_1}{a} = \frac{h - k_1}{b} = \frac{-(ax_1 + by_1 + c)}{a^2 + b^2}$

A. $\left(\frac{81}{25}, \frac{92}{25}\right)$

B. $\left(\frac{92}{25}, \frac{81}{25}\right)$

C. $\left(\frac{46}{25}, \frac{54}{25}\right)$

D. $\left(\frac{-81}{25}, \frac{92}{25}\right)$

Answer: A

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148. The foot of the perpendicular from (0, 0) to the line $x\cos\alpha + y\sin\alpha = p$ is

A. $(\cos\alpha, \sin\alpha)$

B. $(p\cos\alpha, p\sin\alpha)$

C. $(p/\cos\alpha, p/\sin\alpha)$

D. $(p\sin\alpha, p\cos\alpha)$

Answer: B

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149. Prove that the feet of the perpendicular from the origin on the lines $x + y = 4, x + 5y = 26, 15x - 27y = 424$ are collinear.

A. $3x + y - 8 = 0$

B. $3x - 7 + 8 = 0$

C. $3x + y + 8 = 0$

D. $3x - y - 8 = 0$

Answer: A

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150. The image of the point (2, -1) w.r.t the point (1, -4) is

A. (1, 2)

B. (0, 5)

C. (0, -7)

D. (4, -3)

Answer: C

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151. The image of the point (2, 1) w.r.t the line $x + 1 = 0$ is

A. (2, 5)

B. (0, 5)

C. (-4, 1)

D. (-2, -3)

Answer: C

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152. The image of the point (3, 4) w.r.t the line $3x + 4y + 5 = 0$ is

A. $\left(\frac{21}{5}, \frac{28}{5}\right)$

B. $\left(\frac{21}{5}, -\frac{28}{5}\right)$

C. $\left(-\frac{21}{5}, \frac{28}{5}\right)$

D. $\left(-\frac{21}{5}, -\frac{28}{5}\right)$

Answer: D

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153. 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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154. The coordinate of the image of the orgin O with respect to the straight line $x + y + 1 = 0$ are

A. $(-1/2, -1/2)$

B. (-2, -2)

C. (1, 1)

D. (-1, -1)

Answer: D

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155. The reflection of the point (6, 8) in the line x = y is

A. (4, 2)

B. (-6, -8)

C. (-8, -10)

D. (8, 6)

Answer: D

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

A. $6x - 4y - 7$

B. $2x + 3y - 5$

C. $3x - 2y + 5$

D. $3x - 2y + 10$

Answer: C

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

A. $3x - y = 0$

B. $4x - y = 0$

C. $3x + 4y = 1$

D. $4x + 3y = 1$

Answer: C

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

A. (57/13, -168/13)

B. (3, 4)

C. (1, 2)

D. (-4, 13)

Answer: A

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160. If the point (1, 2) is reflected through the origin and then through the line $x = y$, then the new coordinates of the point are

A. (1, 2)

B. (2, -1)

C. (2, 1)

D. (-2, 1)

Answer: C

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161. A ray of light along $x + \sqrt{3}y = \sqrt{3}$ gets reflected upon reaching x-axis, the equation of the reflected ray is

A. $y = \sqrt{3}x - \sqrt{3}$

B. $\sqrt{3}y = x - 1$

C. $y = x + \sqrt{3}$

D. $\sqrt{3}y = x - \sqrt{3}$

Answer: D

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162. If $2x - 3y - 5 = 0$ is the perpendicular bisector of the line segment joining $(3, -4)$ and (α, β) then find $\alpha + \beta$.

A. $-81/13$

B. $-136/13$

C. $-135/13$

D. $-134/15$

Answer: A

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163. If $x + 3y = 16$ is the perpendicular bisector of $\overline{AB}$ and A(5, 7), then B is

A. (2, 1)

B. (3, 1)

C. (9, 1)

D. (-2, -3)

Answer: B

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164. 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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165. 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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166. The equation of perpendicular bisectors of AB and AC of a triangle ABC are x-y-5=0 and x+2y=0 respectively. If A=(1,-2) then the equation of $\overline{BC}$ is

A. $14x + 23y - 40 = 0$

B. $14x - 23y + 20 = 0$

C. $23x - 14y + 40 = 0$

D. $23x + 14y - 20 = 0$

Answer: A

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167. The image of $3x - 4y + 11 = 0$ with respect to $2x - y - 1 = 0$ is

A. $3x + 4y - 5 = 0$

B. $4x + 3y - 5 = 0$

C. $x = 3$

D. $5x + 12y - 2 = 0$

Answer: C

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168. The image line of $2x - y - 1 = 0$ w.r.t. $3x - 2y + 4 = 0$ is

A. $22x + 19y + 77 = 0$

B. $22x - 19y + 77 = 0$

C. $2x - y + 7 = 0$

D. $3x - 2y + 11 = 0$

Answer: B

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Exercise 2 Special Type Questions Set 1

1. The equation of the line perpendicular to the line $2x + 3y - 5 = 0$ and passing through (3, -4) is

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer: B

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2. If (-4,5) is one verted and $7x - y + 8 = 0$ is one diagonal of a square, then the equation of the second diagonal is

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer: C

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3. The normal form of line $\sqrt{3}x = y + 4 = 0$ is

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer: B

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4. The slope of a straight line passing through A(-2, 3) is $-4/3$. The points on the line that are 10 unit away from A are

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer: C

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

II : The point equidistant to the lines $4x + 3y + 10 = 0, 5x - 12y + 26 = 0, 7x + 24y - 50 = 0$ is (0, 0).

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer: C

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6. The circumcentre of the triangle passing through $(1, \sqrt{3}), (1, -\sqrt{3}), (3, -\sqrt{3})$ is

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer: C

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7. The quadrilateral formed by the lines $\sqrt{3}x + y = 0, \sqrt{3}y + x = 0, \sqrt{3}x + y = 1, \sqrt{3}y + x = 1$ is

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer: B

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8. I : The $2x + ky - 10 = 0, 5x + 2y - 7 = 0$ are parallel then k = 4.

II : If $2x + ky - 10 = 0, 5x + 2y - 7 = 0$ are perpendicular then k = 5.

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer: D

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9. I : The foot of the perpendicular of (3, -5) in y-axis is (-5, 3).

II. If (2, -3) is the foot of the perpendicular from (-4, 5) on a line then the equation of the line is $3x - 4y = 18$.

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer: B

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10. I : The image of the point (2, 1) with respect to the line $x + 1 = 0$ is (-4, 1).

II. If the point (1, 2) is reflected through origin and then through the line x = y then the new coordinates of the point are (-2, -1).

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer: C

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Exercise 2 Special Type Questions Set 2

1. The arrangement of the following straight lines in ascending order of their slopes

$(A)2y = \sqrt{3}x \quad (B)y = 2 \quad (C)y = x \quad (D)y = -x$

A. A,B, C, D

B. D, B, A, C

C. B, C, D, A

D. D, A, B, C

Answer: B

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2. If A, B, C are the x intercepts of the lines $2x + 3y = 4, 3y - 5x + 7 = 0, x + y + 1 = 0$ then the ascending order of A, B, C is

A. A,B, C

B. B, A, C

C. C, B, A

D. A, B, C

Answer: C

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3. The equation of the line passing through the point P(1, 2) such that P bisects the part intercepted between the axes is

A. a, b, c

B. c, a, b

C. b, c, a

D. c, b, a

Answer: D

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4. Write the ascending order of areas of the triangles formed with coordinate axes and the following lines

$(A)x + y + 3 = 0 \quad (B)x + y + 1 = 0 \quad (C)2x + y - 6 = 0 \quad (D)4x +$

A. A, B, C, D

B. B, A, D, C

C. C, A, B, D

D. D, C, A, B

Answer: B

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5. Write the ascending order of the distance between the parallel lines

(A) $2x + 3y + 1 = 0, 2x + 3y + 14 = 0$

(B) $3x + 4y + 10 = 0, 3x + 4y + 5 = 0$

(C) $x + y + 1 = 0, x + y + 3 = 0$

(D) $2x + y + 1 = 0, 2x + y + 6 = 0$

A. B, C, D, A

B. A, B, C, D

C. B, D, C, A

D. B, C, A, D

Answer: A

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6. Write the descending order of the perpendicular distance of the line $2x - y + 5 = 0$ from

$(A)(2, 1) \quad (B)(2, -1) \quad (C)(-2, 1) \quad (D)(-2, -1)$

A. A, B, C ,D

B. B, A, D, C

C. B, D, C, A

D. B, C, D, A

Answer: B

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7. The equation of the line passing through the point of intersection of the lines $2x + y + 1 = 0, x - y - 7 = 0$ and the point (3, -2) is

A. a, b, c

B. c, a, b

C. b, c, a

D. c, b, a

Answer: D

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Exercise 2 Special Type Questions Set 3

1. Match the following

Line	Slope
$I.\ 33x - 3y - 38 = 0$	$(a) - 2/3$
$II.\ 4x - y - 2 = 0$	$(b) 4$
$III.\ 2x + 3y - 6 = 0$	$(c) - 2/13$
$IV.\ 2x + 25y = 1$	$(d) 11$
	$(e) - 2/25$

A. a, b, c, d

B. d, b, a, e

C. b, d, e, c

D. b, d, c, a

Answer: B

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2. Match the following

I. The line passing through $(5, 4)$ with slope $-7/2$is — $(a) 2x - y$

II. The altitude through A of triangle ABC where A(1, 1), B(-3, 4), C(2, -5) is — $(b) 5x - 9y$

III. The perpendicular bisector of the line segment joining (1,2), (-3, 4) is — $(c) 7x + 2y$

IV. The line perpendicular to $2x + 3y - 4 = 0$ and passing through origin is — $(d) 3x - 2y$

A. d, b, a, e

B. d, c, b, e

C. d, e, b, c

D. c, b, a, d

Answer: D

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3. Match the following

Line	Area of the triangle formed with axes
$I.\ x + y = 10\sqrt{2}$	$(a)\sqrt{3}/2$
$II.\ 2x - 3y - 6 = 0$	$(b)72/\sqrt{3}$
$III.\ \sqrt{3}x + y - 12 = 0$	$(c)6$
$IV.\ 3x - 4y - 12 = 0$	$(d)100$
	$(e)3$

A. d, b, a, e

B. d, c, b, e

C. d, e, b, c

D. a, b, c, d

Answer: C

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4. Match the following

Line	Distance from origin
$I.\ x-2y+1=0$	$(a) 7/\sqrt{10}$
$II.\ x+\sqrt{3}y+2=0$	$(b) 4/\sqrt{5}$
$III.\ 3x-y+7=0$	$(c) 1/\sqrt{5}$
$IV.\ 2x-y-4=0$	$(d) 1$
	$(e) 7/10$

A. c, d, a, b

B. a, b, c, d

C. b, a, c, d

D. e, c, d, a

Answer: A

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5. Match the following

Line	Intercepts
$I.\ 3x + 4y = 6$	$(a) -13/2, -13/3$
$II.\ 5x - 2y + 10 = 0$	$(b) 5, 5/3$
$III.$ joining the points $(2, -1), (-1, 2)$	$(c) -2, 5$
$IV.$ Joining the points $(4, -7), (1, -5)$	$(d) 2, 3/2$

A. c, d, a, b

B. c, b, a, d

C. d, c, b, a

D. a, b, c, d

Answer: C

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6. Match the following

I. Line passing through (-4, 3) and having intercepts in the ratio $5:3$ $(a)2$

II. Line passing through P(2, -5) such that P bisects the part intercepted between the axes $(b)5$

III. Line parallel to $2x - 3y + 5 = 0$ with x-intercept $2/5$ is $(c)3$

IV. Line perpendicular to $5x + 2y + 7 = 0$ with x-intercept $4/5$ is $(d)1$

A. b,c, d, a

B. c, b, d, a

C. d, c, b, a

D. a, b, c, d

Answer: B

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7. Match the following

System of lines	Point of concurrence
$I.\ (3k-1)x-(2k+3)y+(9-k)=0$	$(a)(-2, 1)$
$II.\ (a+2b)x+(a-b)y+(a+5b)=0$	$(b)(3, 4)$
$III.\ (2x+3y+1)+k(3x-2y-5)=0$	$(c)(2, 2)$
$IV.\ a(x+y-4)+b(2x-y-2)=0$	$(d)(1, -1)$

A. b, c, d , a

B. b, a, d, c

C. d, c, b, a

D. a, b, c, d

Answer: B

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8. Match the following

I. Foot of the perpendicular from $(3, 4)$ to the line $3x-4y=18$	$(a)(-7/5$
II. Image of $(-3, 4)$ with respect to the origin	$(b)(-1, -$
III. Image of $(1, 2)$ with respect to $3x+4y-1=0$	$(c)(6,0)$
IV. The reflection of $(4, -13)$ in the line $5x+y+6=0$	$(d)(3, -4$

A. c, d, a, b

B. c, b, d, a

C. d, c, b, a

D. a, b, c, d

Answer: A

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Exercise 2 Special Type Questions Set 4

1. A : The equation of the line passing through (1, 2) with slope $2/5$ is $2x - 5y + 8 = 0$

R : The equation of the line passing through (x_1, y_1) with slope m is $y - y_1 = m(x - x_1)$

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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2. A : Equation of the line passing through (-2, 3) and parallel to $3x - 4y + 7 = 0$ is $3x - 4y + 18 = 0$.

R : Equation of the line passing through (x_1, y_1) and parallel to $ax + by + c = 0$ is $a(x - x_1) + b(y - y_1) = 0$

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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3. A : Equation of the line passing through (3, -4) and perpendicular to $2x + 3y + 7 = 0$ is $3x - 2y - 17 = 0$.

R : Equation of the line passing through (x_1, y_1) and perpendicular to $ax + by + c = 0$ is $b(x - x_1) - a(y - y_1) = 0$

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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4. A : The distance between the straight lines $2x - y + 3 = 0, y = 2x + 4$ is $1/\sqrt{5}$.

R : Distance between parallel lines $ax + by + c_1 = 0, ax + by + c_2 = 0$ is $\frac{|c_1 - c_2|}{\sqrt{a^2 + b^2}}$.

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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5. A : If the angle between the lines $kx - y + 6 = 0, 3x + 5y + 7 = 0$ is $\pi/4$ one value of k is 4

R : If θ is angle between the lines with slopes m_1, m_2 then $\tan\theta = \frac{|m_1 - m_2|}{|1 + m_1 m_2|}$.

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: D

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6. A : The number of lines that can be drawn through the point (4, -5) at a distance of 10 units from the point (1, 3) is zero

R : Required distance is greater than the distance between points or distance 10 units from (1, 3) through (4, -5) is not possible

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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7. A : The ratio in which the perpendicular through (4, 1) divides the line joining (2, -1), (6, 5) is $5:8$.

R : The ratio in which the line $ax + by + c = 0$ divides the line segment joining $(x_1, y_1), (x_2, y_2)$ is $(ax_1 + by_1 + c) : -(ax_2 + by_2 + c)$.

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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8. A : The area of the rhombus formed by $|x| + |y| = 1$ is 2

R : The area of the rhombus formed by $ax \pm by \pm c$ is $2c^2 / |ab|$

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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9. A : The area of the parallelogram formed by $4x - 7y - 13 = 0, 8x - y - 39 = 0, 4x - 7y + 39 = 0, 8x - y + 13 = 0$ is 52.

R : The area of the parallelogram formed by $a_1x + b_1y + c_1 = 0, a_1x + b_1y + d_1 = 0, a_2x + b_2y + c_2 = 0, a_2x + b_2y +$ is $\left|\frac{(c_1 - d_1)(c_2 - d_2)}{a_1b_2 - a_2b_1}\right|$

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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10. A : The foot of the perpendicular from (3, 4) on the line $3x - 4y + 5 = 0$ is $(81/25, 92/25)$

R : If (h, k) is the foot of the perpendicular from (x_1, y_1) to the line $ax + by + c = 0$ then $\frac{h - x_1}{a} = \frac{h - k_1}{b} = \frac{-(ax_1 + by_1 + c)}{a^2 + b^2}$

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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11. A : The reflection of (6, 8) in the line $x = y$ is (8, 6)

R : The reflection of (x_1, y_1) in the line $x = y$ is (y_1, x_1)

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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12. A : The image of the origin with respect to the line $x + y + 1 = 0$ is (-1, -1)

R : If (h, k) is the image of (x_1, y_1) with respect to the line $ax + by + c = 0$ then $\frac{h - x_1}{a} = \frac{h - k_1}{b} = \frac{-2(ax_1 + by_1 + c)}{a^2 + b^2}$

A. A, R are correct, R is correct explaination of A

B. A, R are correct, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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