MATHS

BOOKS - NEW JYOTHI MATHS (TAMIL ENGLISH)

STRAIGHT LINES

Examples

1. Find the slope of the straight line through (-3, 2) and (3, 3).

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2. Find whether the line through (-3, 2) and (3, 3) is perpendicular or parallel or neither perpendicular nor parallel to the line through (-2, -1) and (4, 0).

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3. i. Find the slope of the line joining (-2,6) and (4,8).

ii. Find the value of x, if the above line is perpendicular to the line joining (8, 12) and (x, 24).

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4. The vertices of ΔABC are A(2,4) B(-4, 2) and C(0,0). Find the slopes of AC and AB.

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5. Find the angle between x-axis and the line joining (2,-1) and (4, -3).

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6. The slope of a line is double of the slope of another line. Iftangent of the angle between them $\frac{1}{3}$, find the slopes of the lines.

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7. If the angle between two lines is $\frac{\pi}{4}$ and slope of one of the lines is $\frac{1}{2}$, find the slope of the other line.

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8. Find the slope of a line, which passes through the origin, and the mid-point of the line segment joining the points P(0, -4) and B(8, 0).

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9. For what value of x, the points (x,-1), (2, 1) and (4,5) are collinear?

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10. If three points $A(h, 0),\ P(a, b) and\ B(0, k)$ lie on a line, show that: $\frac{a}{h} + \frac{b}{k} = 1$.

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11. Consider the following population and year graph. Find the slope of the line AB and using it, find what will be the population in the year 2010?

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12. Draw a quadrilateral in the Cartesian plane, whose vertices are (-4,5), (0,7), (5,-5) and (-4,-2). Also, find its area.

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13. The base of an equilateral triangle with side 2a lies along the y-axis such that the mid-point of the base is at the origin. Find vertices of the triangle.

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14. Find the distance between P(x_1, y_1) and Q(x_2, y_2) when :

i. PQ is parallel to the y-axis, ii. PQ is parallel to the x-axis.

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15. Find a point on the x-axis, which is equidistant from the points (7,6) and (3, 4).

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16. Find the slope of a line, which passes through the origin, and the mid-point of the line segment joining the points P(0, -4) and B(8, 0).

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17. Without using the Pythagoras theorem, show that the points (4,4), (3, 5) and (-1,-1) are the vertices of a right angled triangle.

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18. Find the slope of the line, which makes an angle of 30° with the positive direction of y-axis measured anticlockwise.

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19. Without using distance formula, show that points $(-2, -1), (4, 0), (3, 3)$ and $(-3, 2)$ are the vertices of a parallelogram.

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20. . Find the angle between the x-axis and the line joining the points $(3, -1)$ and $(4, -2)$.

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21. A line passes through (x_1, y_1) and (h, k). If slope of the line is m, show that $k - y_1 = m(h - x_1)$.

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22. Find the equation of a straight line passing through (-5,7) and parallel to the x - axis.

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23. Find the equation of the line which is parallel to y-axis and passing through the point (3,4).

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24. Find the equation of the line passing through the point (-2, 3) with slope - 4.

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25. Find the equation of a line through the origin which makes an angle of 45° with the positive direction of x-axis.

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26. Consider the line joining the points (2, - 1) and (6, – 3).

i. Find its slope.

ii. Find the equation of the perpendicular bisector.

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27. The vertices of triangle ABC are A (-2, 3), B (2, -3) and C (4,5)

i. Find the slope of BC.

ii. Find the equation of the altitude of triangle ABC passing through A.

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28. Write the equation of the line through the points (1,-1) and (3,5)

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29. Find the equation of the line intersecting x-axis at a distance of 3 units to the left of the origin with slope -2.

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30. Find the equation of a line that cuts off equal intercepts on the coordinate axes and passes through the point (2, 3).

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31. Find the equation of the line which passes through the point (3, 4) and whose intercepts on the axes are equal in magnitude but opposite in sign.

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32. Find the equation of the line through the point (3, 3) and cutting off intercepts on the axes whose sum is 12.

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33. Find the equation of the line which has the length of the perpendicular from origin to the line as 4 units and

the perpendicular segment on the line l makes an angle of 120° with the positive direction of x-axis.

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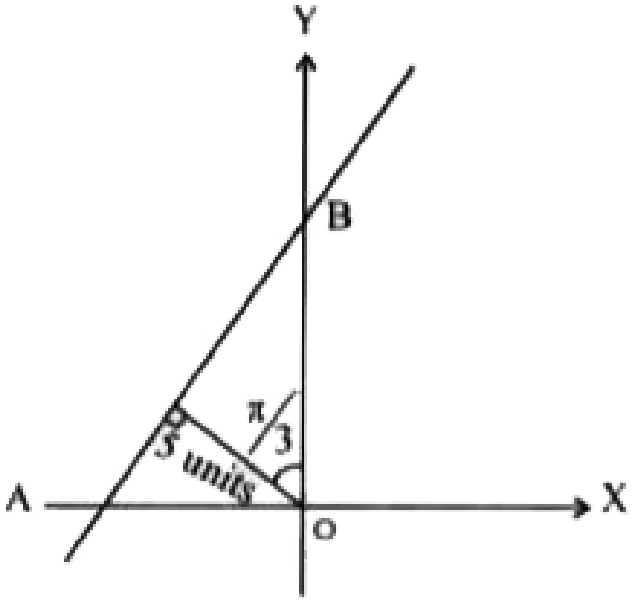
34. In the figure given below, find the equation of the line AB.



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35. By using the concept of equation of a line, prove that the three points (3,0), (-2, - 2) and (8, 2) are collinear.

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36. Intersecting the y-axis at a distance of 2 units above the origin and making an angle of 30° with positive direction of the x-axis.

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37. Find the equation of line which is at Perpendicular distance from the origin is 5 units and the angle made by

the perpendicular with the positive x-axis is 30°.

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38. Find the equation of the line passing through (-3, 5) and perpendicular to the line through the points (2,5) and (-3, 6).

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39. A line perpendicular to the line segment joining the points (1, 0) and (2, 3) divides it in the ratio 1: n. Find the equation of the line.

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40. Find equation of the line through the point(0, 2) making an angle $\frac{2\pi}{3}$ with the positive x-axis. Also, find the equation of line parallel to it and crossing the y-axis at a distance of 2 units below the origin.

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41. The perpendicular from the origin to a line meets it at the point $(-2, 9)$ find the equation of the line.

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42. The length L (in centimetrs) of a copper rod is a linear function of its Celsius temperature C. In an experiment, if

L = 124.942 when C = 20 and L= 125.134 when C = 110, express L in terms of C.

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43. The owner of a milk store finds that, he can sell 980 litres of milk each week at Rs. $14/\text{litre}$ and 1220 litres of milk each week at Rs $16/\text{litre}$. Assuming a linear relationship between selling price and demand, how many litres could he sell weekly at Rs $17/\text{litre}$?

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44. P (a, b) is the mid-point of a line segment between axes. Show that equation of the line is $\frac{x}{a} + \frac{y}{b} = 2$

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45. Point R (h, k) divides a line segment between the axes in the ratio 1: 2. Find equation of the line.

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46. Convert the equation of the line $2x - 3y + 6 = 0$ into intercept form.

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47. The equation of a straight line is $3x - 4y + 10 = 0$.

Find

i. slope-intercept form

ii. slope

iii. x and y intercepts.

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48. Consider the points A(2,3) and B (4,5)

i. Find the slope of the line passing through the points A and B.

ii. Find the equation of the line passing through A and B.

iii. Find the x-intercept of the above line.

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49. Reduce the equation of the line $\sqrt{3}x + y - 8 = 0$ into normal form. Find the values of p and ω.

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50. i. Find the point of intersection of the lines 2x +y-3=0, 3x-y-2=0

ii. Find the equation of the line passing through the above point of intersection and parallel to the line x + y + 1 = 0.

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51. Find equation of the line perpendicular to the line $x - 7y + 5 = 0$ and having x - intercept 3.

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52. Consider the straight line $3x + 4y + 8 = 0$

i. What is the slope of the line which is perpendicular to the given line?

ii. If the perpendicular line passes through (2,3), form its equation,

iii. Find the foot of the perpendicular drawn from (2,3) to the given line.

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53. Consider the points A(-2, -3) and B(1,6).

i. Find the equation of the line passing through A and B.

ii. Find the equation of the line passing through (2, 1) and perpendicular to AB

iii. Find the foot of the above perpendicular to AB.

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54. Consider the points A(2, 2) and B(5,3).

i. Find the slope of the line through, the points A and B.

ii. Find the equation of the line passing through the points A and B.

iii. Find the image of the point(1, 2) in the line through A and B.

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55. Find the distance of the point (3,-3) from the line 3x - 4y - 26 = 0

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56. Consider the line 3x – 4y + 2 = 0 and the point (2, -3)

Find the distance of the point from the line.

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57. Find the distance between the parallel lines 3x – 4y + 5 = 0 and 3x – 4y + 7 = 0

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58. i Reduce the equation 3x + 4y - 12 = 0 into intercept form.

ii. Find the distance of the above line from the origin.

iii. Find the distance of the above line from the line 6x + 8y- 18 = 0.

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59. What are the points on the y-axis whose distance from the line $\frac{x}{3}+\frac{y}{4}=1$ is 4 units.

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60. Find the distance between parallel lines

i. 15x+8y-34= 0 and 15x+8y+31=0

ii. l(x + y) + p = 0 and l(x + y) - r = 0.

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61. Find angles between the lines $\sqrt{3}x + y = 1$ and $x + \sqrt{3}y = 1$.

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62. Two lines passing through the point (2, 3) intersects each other at an angle of 60°. If slope of one line is 2, find equation of the other line.

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63. Find the equation of the right bisector of the line segment joining the points $(3, 4)$ and $(-1, 2)$.

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64. Find the coordinates of the foot of perpendicular from the point $(-1, 3)$ to the line $3x - 4y - 16 = 0$.

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65. The perpendicular from the origin to the line y = mx + c meets it at the point $(-1, 2)$. Find the values of m and

c.

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66. If p and q are the lengths of perpendiculars from the origin to the lines $x\cos\theta - y\sin\theta = k\cos 2\theta$ and $x\sec\theta + y\cos ec\theta = k$, respectively, prove that $p^2 + 4q^2 = k^2$.

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67. In the triangle ABC with vertices $A(2, 3), B(4, -1)$ and $C(1, 2)$, find the equation and length of altitude from the vertex A.

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68. ABC is a right triangle right angled at C. Let BC = a, CA = b, AB = c and let p be the length of perpendicular from C on AB. Prove that (i) pc = ab (ii) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$.

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69. Find the value of α and p if the equation $x\cos\alpha + y\sin\alpha = p$ is the normal form of the line $\sqrt{3x} + y + 2 = 0$.

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70. Find the equations of the lines, which cut-off intercepts on the axes whose sum and product are 1 and -6, respectively.

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71. What are the points on the y-axis whose distance from the line $\frac{x}{3}+\frac{y}{4}=1$ is 4 units.

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72. Find perpendicular distance from the origin of the line joining the points $(\cos\theta, \sin\theta)$ and $(\cos\phi, \sin\phi)$.

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73. Find the equation of the line parallel to y-axis and drawn through the point of intersection of the lines $x - 7y + 5 = 0$ and $3x + y = 0$.

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74. Find the equation of a line drawn perpendicular to the line $\frac{x}{4} + \frac{y}{6} = 1$ through the point , where it meets the y-axis.

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75. Find the area of the triangle formed by the lines $y - x = 0, x + y = 0$ and $x - k = 0$.

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76. If three lines whose equations are $y = m_1x + c_1, y = m_2x + c_2$ and $m_3x + c_3$ are concurrent, then show that $m_1(c_2 - c_3) + m_2(c_3 - c_1) + m_3(c_1 - c_2) = 0$.

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77. Find the equation of the lines through the point (3, 2) which make an angle of 45° with the line $x - 2y = 3$.

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78. Find the equation of the line passing through the point of intersection of the lines 4x + 7y - 3 = 0 and 2x – 3y + 1 = 0 that has equal intercepts on the axes.

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79. Show that the equation of the line passing through the origin and making an angle θ with the line $y = mx + c$ is $\frac{y}{x} = \frac{m \pm \tan}{1 \pm m \tan}$.

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80. In what ratio, the line joining $(-1, 1)$ and $(5, 7)$ is divided by the line $x + y = 4$?

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81. Find the distance of the line $4x + 7y + 5 = 0$ from the point $(1, 2)$ along the line $2x - y = 0$.

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82. Find the direction in which a straight line must be drawn through the point $(-1, 2)$ so that its point of intersection with the line $x + y = 4$ may be at a distance of 3 units from this point.

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83. The hypotenuse of a right angled triangle has its ends at the points $(1, 3)$ and $(-4, 1)$. Find an equation of the legs (perpendicular sides) of the triangle.

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84. Find the image of the point (3,8) with respect to the line x+3y = 7 assuming the line to be a plane mirror.

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85. If the lines $y = 3x + 1$ and $2y = x + 3$ are equally inclined to the line $y = mx + 4$,find the value of m.

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86. If sum of the perpendicular distances of a variable point P(x, y) from the lines x+y-5= 0 and 3x - 2y +7=0 is always 10. Show that P must move on a line.

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87. Find equation of the line which is equidistant from parallel lines $9x + 6y - 7 = 0$ and $3x + 2y + 6 = 0$.

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88. Aray of light passing through the point(1, 2) reflects on the x-axis at point A and the reflected ray passes through the point (5,3). Find the coordinates of A.

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89. Prove that the product of the lengths of the perpendiculars drawn from the points $\left(\sqrt{a^2-b^2}, 0\right)$ and $\left(-\sqrt{a^2-b^2}, 0\right)$ to the line $\frac{x}{a}\cos\theta + \frac{y}{b}\sin\theta = 1$ is b^2

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90. A person standing at the junction (crossing) of two straight paths represented by the equations 2x-3y+4= 0 and 3x + 4y-5=0 wants to reach the path whose equation is 6x – 7y+8=0 in the least time. Find equation of the path that he should follow.

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Exercise

1. Two vertices of an equilateral triangle are (0,0) and ($3, \sqrt{3}$) then the third vertex can be

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

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

C. $\left(3, -\sqrt{3} \right)$

D. $\left(-\sqrt{3}, 3 \right)$

Answer: C

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2. The points (-a, -b), (0, 0), (a, b) and $\left(a^2, ab \right)$ are

A. Collinear

B. Vertices of a parallelogram

C. Vertices of a rectangle but not a square

D. Vertices of square

Answer: A

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3. Let P and Q be point on the line joining A(5,6) and B (3, -4) such that AP=PQ=QB. Then the midpoint of PQ is

A. (4,2)

B. (4,1)

C. (3, 1)

D. (2, 2)

Answer: B

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4. Length of median from A to BC of triangle ABC where A (2,5) B (7,-1) and C (3,5) is

A. $2\sqrt{3}$

B. 6

C. $3\sqrt{2}$

D. $\sqrt{20}$

Answer: D

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5. If (3, -4) and (-6,5) are the extremities of the diagonal of a parallelogram and (-2, 1) is its third vertex, then the

fourth vertex is

A. (-1,2)

B. (-1, -2)

C. (2,1)

D. (-1,0)

Answer: D

6. The coordinates of the middle points of the sides of a triangle are (4, 2), (3, 3) and (2,2) then the coordinates of the centroid are

A. $\left(3, \frac{7}{3}\right)$

B. (3, 3)

C. $\left(2, \frac{8}{3}\right)$

D. $\left(\frac{8}{3}, \frac{7}{3}\right)$

Answer: A

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7. The incentre of the triangle ABC where A(-36, 7) B (20,7) and C (0,-8) is

A. (0,-1)

B. (-1,0)

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

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

Answer: B

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8. The triangle with vertices A (2,4), B (2,6) and C ($2+\sqrt{3}$, 5) is

A. right angled

B. right angled isosceles

C. equilateral

D. obtuse angled

Answer: C

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9. The area of the triangle with vertices at the points (a, b + c), (b, c + a) and (c, a + b) is

A. 0

B. a + b + c

C. ab + bc + ca

D. ab + bc

Answer: A

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10. The straight lines $x + y = 0$, $3x + y = 4$, $x + 3y - 4 = 0$ form a triangle which is

A. isosceles

B. equilateral

C. right angled

D. obtuse angled

Answer: A

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11. The image of the point (-1, 3) by the line $x - y = 0$ is

A. (3,-1)

B. (1,-3)

C. (-1,-1)

D. (3,3)

Answer: A

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12. If (4,0) and (1, -1) are two vertices of a triangle of area 4 square units, then its third vertex lies on

A. $x = y$

B. $5x + 4 + 12 = 0$

C. x + 5y = 4

D. 5x – y + 5 = 0

Answer: C

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13. Three lines px + qy+r=0, qx + ry+ p = 0 and rx + py + q = 0 are concurrent of

A. p+q+r=0

B. $p^2 + q^2 + r^2 = pq + qr + rp$

C. $p^3 + q^3 + r^3 = 3pqr$

D. p+q-r=0

Answer: C

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14. If each of the points (x,, 4), (-2, y,) lie on the-line joining the points (2, -1) and (5,-3) then the point P(x_1, y_1) lies on the line

A. 6(x + y) - 25 = 0

B. 2x + 6y + 1 = 0

C. 2x + 3y - 6 = 0

D. 6 (x + y) + 25 = 0

Answer: B

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15. All points lying inside the triangle formed by the points (1, 3), (5,0) and (-1, 2) satisfy

A. $3x + 2y \geq 0$

B. $2x + y - 13 \geq 0$

C. $2x - 3y - 12 \geq 0$

D. $-2x + y \geq 0$

Answer: A

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16. The line segment joining the points (-3,-4) and (1,-2) is divided by y axis in the ratio

A. 1 : 3

B. 2 : 3

C. 3 : 1

D. 3 : 2

Answer: C

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17. The line segment joining the points (1, 2) and (2,1) is divided by the line 3x+4y=7 in the ratio

A. 3 : 4

B. 4 : 3

C. 9 : 4

D. 4 : 9

Answer: D

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18. If the point (5,2) bisects the intercept of a line between the axes then its equation is

A. $5x + 2y = 20$

B. $2x + 5y = 20$

C. $5x - 2y = 20$

D. $2x - 5y = 20$

Answer: B

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19. The equation of the line passing through origin and perpendicular to the line $7x - 3y + 4 = 0$

A. $3x + y = 5$

B. $3x + 7y = 0$

C. $7x + 3y + 15 = 0$

D. $3x - 7y + 23 = 0$

Answer: A

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20. The image of the point (3, 8) with respect to the line x + 3y = 8 is

A. $(5, \frac{-17}{4})$

B. $(\frac{-5}{4}, -4)$

C. (0, -1)

D. None of these

Answer: D

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21. Line $x + 2y - 8 = 0$ is the perpendicular bisector of AB. If $B = (3, 5)$ the A is

A. (2,1)

B. (1, 2)

C. (2, 2)

D. (1,1)

Answer: D

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22. If the algebraic sum of the distances from the points (2,0), (0, 2) and (1, 1) to a variable line be zero then the line

passes through the fixed point.

A. (0,0)

B. (1, 1)

C. (-1, 1)

D. (2,1)

Answer: B

23. If a, b, c are in AP then ax + by +c=0 represents

A. a single line

B. a family of concurrent lines

C. a family of parallel lines

D. Two lines which are not parallel

Answer: B

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24. The set of lines ax + by + c = 0 where 3a + 2b + 4c = 0 intersect at the point

A. $\left(\frac{3}{4}, \frac{1}{2}\right)$

B. $\left(\frac{1}{2}, \frac{3}{4}\right)$

C. $\left(\frac{-3}{4}, \frac{-1}{2}\right)$

D. $\left(\frac{-1}{2}, \frac{-3}{4}\right)$

Answer: A

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25. If a, b, c are in AP then ax + by + c = 0 will always pass through a fixed point whose coordinates are

A. (1,-2)

B. (-1,2)

C. (1,2)

D. (-1, -2)

Answer: A

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26. The mid points of the sides of a triangle are (5, 0), (5, 12) and (0, 12). The orthocentre of this triangle is

A. (0,0)

B. (10,0)

C. (0, 24)

D. $\left(\frac{13}{3}, 18\right)$

Answer: A

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27. One vertex of the equilateral triangle with centroid at the origin and one side as x + y - 2 = 0 is

A. (-1,-1)

B. (2, 2)

C. (-2,-2)

D. (4, 5)

Answer: C

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28. A (-5,0) and B (3,0) are two of the verti- ces of a triangle ABC. Its area is 20 square units. The vertex Clies on the line x - y = 2. The coordinates of C are

A. (-7, -5) or (3,5)

B. (-3,-5) or (-5, 7)

C. (7,5) or (3,5)

D. (-3, -5) or (7,5)

Answer: D

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29. The ratio in which the line $3x+4y+2 = 0$ divides the distance between $3x + 4y + 5 = 0$ and $3x + 4y - 5 = 0$

A. 7 : 3

B. 3 : 7

C. 2 : 5

D. 5 : 2

Answer: B

30. If the foot of perpendicular from the origin to a straight line is at the point (3,-4). Then the equation of the line is

A. $3x - 4y = 25$

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

C. $4x + 3y - 25 = 0$

D. $4x + 3y + 25 = 0$

Answer: A

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31. A rectangle has two opposite vertices at (1, 2) and (5,5). If the other vertices lie on the line x = 3 then their coordinates are

A. (3, 1), (3, 3)

B. (3,1),(3,6)

C. (3,1),(3,4)

D. (3,2), (3,3)

Answer: B

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32. If the lines $ax + 2y + 1 = 0$, $bx + 3y + 1 = 0$, $cx + 4y + 1 = 0$ are concurrent, then a, b, c are in

A. AP

B. GP

C. HP

D. AGP

Answer: A

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33. The distance of the point (3, 5) from the line 2x + 3y - 14 = 0 measured parallel to the line x - 2y = 1 is

A. $7\sqrt{5}$

B. $7\sqrt{13}$

C. $\sqrt{5}$

D. $\sqrt{13}$

Answer: C

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34. 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 of AB so that the triangle OAB is equilateral, where O is the origin.

A. $x - 2 = 0$

B. $y - 2 = 0$

C. $x + y - 4 = 0$

D. $x+y+z = 0$

Answer: B

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35. If the extremities of the base of an isosce- les triangle are the points (2a, 0) and (0,a) and the equation of one of the sides is x=2a, then the area of the triangle is

A. $5a^2$ sq. units

B. $\frac{5}{2}a^2$ sq. units

C. $\frac{25}{2}a^2$ sq. units

D. $10a^2$ sq. units

Answer: B

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36. The equation of the line passing through the intersection of $x - \sqrt{3}y + \sqrt{3} - 1 = 0$ and x + y - 2 = 0 and making an angle 15° with the first line is

A. x - y = 0

B. x - y + 1 = 0

C. y = 1

D. $\sqrt{3}x - y + 1 - \sqrt{3} = 0$

Answer: A

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37. The equations of the lines through (-1,-1) and making angles 45° with the line x + y = 0 are given by

A. x + 1 = 0, x - y = 0

B. y + 1= 0, 2 - y = 0

C. x + 1 = 0, y + 1 = 0

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

Answer: C

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38. If the vertices of a diagonal of a square (-2, 4) and (-2, 2) then its other two vertices are

A. (1,-1) and (5, 1)

B. (1, 1) and (5, 1)

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

D. None of these

Answer: D

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39. The orthocentre of the triangle formed by the lines x = 0, y = 0 and x + y = 1 is

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

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

C. (0, 0)

D. $\left(\frac{1}{4}, \frac{1}{4}\right)$

Answer: C

Watch Video Solution

40. The foot of the perpendicular from the point (3,4) on the line $3x - 4y + 5 = 0$ is

A. (-2, 3)

B. (2, 1)

C. (3, 2)

D. (1,2)

Answer: B

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41. The coordinates of the image of the origin O w.r.t the line $x + y + 1 = 0$ are

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

B. (-2, -2)

C. (1, 1)

D. (-1, -1)

Answer: D

Watch Video Solution

42. The incentre of the triangle with vertices (1, $\sqrt{3}$) (0,0) (2,0) is

A. $\left(1, \frac{\sqrt{3}}{2}\right)$

B. $\left(\frac{2}{3}, \frac{1}{\sqrt{3}}\right)$

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

D. $\left(1, \frac{1}{\sqrt{3}}\right)$

Answer: D

Watch Video Solution

43. The angle between the lines 2x - y+3 = 0 and x + 2y + 3 = 0 is

A. 90°

B. 60°

C. 45°

D. 30°

Answer: A

Watch Video Solution

44. Distance between the lines 5x + 3y-7 = 0 and 15x +9y + 14 = 0 is

A. $\frac{35}{\sqrt{34}}$

B. $\frac{1}{3\sqrt{34}}$

C. $\frac{35}{3\sqrt{34}}$

D. $\frac{35}{2\sqrt{34}}$

Answer: C

Watch Video Solution

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

A. $3x + 2y = 6$

B. $3x - 2y = -6$

C. $3x + 2y + 6 = 0$

D. $3x - 2y = 6$

Answer: D

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46. The third vertex of an equilateral triangle whose vertices are (2, 4), (2, 6)

A. $(2 + \sqrt{3}, 5)$

B. $(2\sqrt{3}, 5)$

C. $(\sqrt{2}, 5)$

D. $(\sqrt{3}, 5)$

Answer: A

Watch Video Solution

47. The area enclosed by the curve |x| + |y| = 1 is

A. 2

B. 1.5

C. 3

D. 8

Answer: B

Watch Video Solution

48. The area enclosed by the curves $ax \pm by \pm c = 0$ where $a, b, c > 0$

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

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

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

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

Answer: A

Watch Video Solution

49. The lines ax + 3y + 19 = 0 and 9x + 6y-17 = 0 cut the coordinate axes in concyclic points then a =

A. 1

B. 2

C. -1

D. $\frac{-9}{2}$

Answer: B

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50. The point on the line $3y - 4x + 11 = 0$ equidistant from $(3, 2)$ and $(-2,3)$ is

A. $(3, 5)$

B. $(-1, -11)$

C. $(1, 3)$

D. None of these

Answer: D

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51. The vertices of a triangle have integer co- ordinates then the triangle cannot be

A. equilateral

B. isosceles

C. right angled

D. right angled isosecles

Answer: A

Watch Video Solution

52. A (2, 5), B (-1, 3) and C (5, -1) are the vertices of a triangle. The image of the point (1,2) with respect to the

median through A is

A. (2, 1)

B. (3, 2)

C. $\left(\frac{3}{2}, \frac{7}{2}\right)$

D. (-1, -2)

Answer: B

Watch Video Solution

53. The reflection of the point (6, 8) in the line x - y = 0 is

A. (6, 8)

B. (-6, 8)

C. (-8, -6)

D. (8, 6)

Answer: D

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Questions From Competitive Exams

1. The incentre of the triangle ABC where A(-36, 7) B (20,7) and C (0,-8) is

A. $\left(\frac{\sqrt{105}}{3}\right)$

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

C. $\left(\frac{\sqrt{211}}{3}\right)$

D. $\left(\frac{\sqrt{205}}{3}\right)$

Answer: D

Watch Video Solution

2. The foot of the perpendicular from the point (3,4) on the line 3x – 4y + 5 = 0 is

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

Watch Video Solution

3. The equation of the base BC of an equilateral triangle ABC is x+y= 2 and A is (2, -1). The length of the side of the triangle is

A. $\sqrt{2}$

B. $\left(\frac{3}{2}\right)^{1/2}$

C. $\frac{1}{2}$

D. $\left(\frac{2}{3}\right)^{1/2}$

Answer: D

Watch Video Solution

4. The product of the perpendiculars from (-1,2) to the pair of lines

$2x^2 - 5xy + 2y^2 + 3x - 3y + 1 = 0$ is

A. $\frac{5}{12}$

B. $\frac{12}{5}$

C. $\frac{6}{5}$

D. $\frac{5}{6}$

Answer: B

View Text Solution

5. The distance between the pair of parallel lines $x^2 + 4xy + 4y^2 + 3x + 6y - 4 = 0$ is

A. $\frac{4\sqrt{3}}{3}$

B. $2\sqrt{2}$

C. $4\sqrt{2}$

D. 4

Answer: D

Watch Video Solution

6. The four lines $6x^2 - 5xy - 6y^2 + x + 5y - 1 = 0$ and $6x^2 - 5xy - 6y^2 = 0$, form a

A. parallelogram

B. rhombus

C. rectangle

D. square

Answer: D

Watch Video Solution

7. The foot of perpendicular from (-2, 3) to the line 2x - y - 3 = 0 is

A. (-2, 3)

B. (2, -1)

C. (3, 2)

D. (1, 2)

Answer: B

Watch Video Solution

8. If the lines $x - y - 1 = 0$, $4x + 3y = k$ and $2x - 3y + 1 = 0$ are concurrent, then k is

A. 1

B. -1

C. 25

D. 5

Answer: C

Watch Video Solution

9. The centroid of a triangle formed by the points (0,0), ($\cos\theta, \sin\theta$) and ($\sin\theta, -\cos\theta$) lies on the line y = 2x, then is

A. $\tan^{-1} 2$

B. $\tan^{-1} 1/3$

C. $\tan^{-1} 1/2$

D. $\tan^{-1}(-3)$

Answer: D

Watch Video Solution

10. The orthocentre of the triangle formed by (8,0) and (4, 6) with the origin is

A. $\left(4, \frac{8}{3}\right)$

B. (3, -4)

C. (4, 3)

D. (3, 4)

Answer: A

Watch Video Solution

11. If $xy - 4x + 3y - \lambda = 0$ represents the asymptotes of xy - 4x + 3y = 0, then λ is

A. 3

B. - 6

C. 8

D. 12

Answer: D

Watch Video Solution

12. The inclination of the straight line passing through the point (-3, 6) and the midpoint of the line joining the

points (4, -5) and (-2,9) is

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

B. $\frac{\pi}{6}$

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

D. $\frac{3\pi}{4}$

Answer: D

Watch Video Solution

13. A point moves such that the area of the triangle formed by it with the points (1,5) and (3,-7) is 21 sq. units. Then locus of the point is

A. 6x + y - 32 = 0

B. 6x – y +32 = 0

C. x + 6y - 32 = 0

D. 6x - y - 32 = 0

Answer: A

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14. The line $\frac{x}{a} - \frac{y}{b} = 1$ cuts the x-axis at P. The equation of the line through P perpendicular to the given line is

A. x + y = ab

B. x+y= a + b

C. $ax + by = a^2$

D. $bx + ay = b^2$

Answer: C

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15. The value of λ for which the lines 3x + 4y=5, 2x+3y=4 and $\lambda x + 4y = 6$ meet at a point is

A. 2

B. 1

C. 4

D. 3

Answer: A

Watch Video Solution

16. The orthocentre of the triangle whose vertices are (5,-2), (-1, 2) and (1,4) is

A. $\left(\frac{1}{5}, \frac{14}{5}\right)$

B. $\left(\frac{14}{5}, \frac{1}{5}\right)$

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

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

Answer: A

Watch Video Solution

17. Distance between the lines 5x + 3y-7 = 0 and 15x +9y + 14 = 0 is

A. $\frac{35}{\sqrt{34}}$

B. $\frac{1}{\sqrt{34}}$

C. $\frac{35}{3\sqrt{34}}$

D. $\frac{35}{2\sqrt{34}}$

Answer: C

Watch Video Solution

18. If the equation $2x^2 + 7xy + 3y^2 - 9x - 7y + k = 0$ represents a pair of lines, then kis equal to

A. 4

B. 2

C. 1

D. -4

Answer: A

Watch Video Solution

19. The angle between the lines 2x - y+3 = 0 and x + 2y + 3 = 0 is

A. 90°

B. 60°

C. 45°

D. 30°

Answer: A

Watch Video Solution

20. Distance between the pair of lines represented by the equation $x^2 - 6xy + 9y^2 + 3x - 9y - 4 = 0$ is

A. $\frac{15}{\sqrt{10}}$

B. $\frac{1}{2}$

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

D. $\frac{1}{\sqrt{10}}$

Answer: C

Watch Video Solution

21. The centroid of a triangle is (2,7) and two of its vertices are (4, 8) and (-2, 6). The third vertex is

A. (0, 0)

B. (4, 7)

C. (7, 4)

D. (7, 7)

Answer: B

Watch Video Solution

22. The points (1, 1), (-5,5) and (13, λ) lie on the same straight line if $\lambda =$

A. 7

B. -7

C. ± 7

D. 0

Answer: B

Watch Video Solution

23. If the lines 3x + 4y+ 1 = 0, $5x + \lambda y + 3 = 0$ and 2x + y-1 = 0 are concurrent, then $\lambda =$

A. -8

B. 8

C. 4

D. -4

Answer: B

Watch Video Solution

24. If the equation $kx^2 - 2xy - y^2 - 2x + 2y = 0$ represents a pair of lines, then k =

A. 2

B. -2

C. -5

D. 3

Answer: D

Watch Video Solution

25. The x-coordinate of the incentre of the triangle where the midpoints of the sides are (0, 1) (1, 1) and (1, 0) is

A. $2+\sqrt{2}$

B. $1+\sqrt{2}$

C. $2-\sqrt{2}$

D. $1-\sqrt{2}$

Answer: C

Watch Video Solution

26. Two consecutive sides of a parallelogram are 4x + 5y = 0 and 7x + 2y = 0. One diagonal of the parallelogram is 11x+7y=9. If the other diagonal is ax + by + c = 0, then

A. a = -1, b=-1, c = 2

B. a = 1, b =-1, c = 0

C. a = -1, b = -1, c = 0

D. a = 1, b = 1, c= 0

Answer: B

Watch Video Solution

27. $ax + by - a^2 = 0$, where a, b non-zero, is the equation to the straight line perpendicular to a line l and passing through the point where I crosses the x-axis. Then equation to the line / is

A. $\frac{x}{b} - \frac{y}{a} = 1$

B. $\frac{x}{a} - \frac{y}{b} = 1$

C. $\frac{x}{b} + \frac{y}{a} = ab$

D. $\frac{x}{a} - \frac{y}{b} = ab$

Answer: B

Watch Video Solution

28. A straight line through P(1, 2) is such that its intercept between the axes is bisected at P. Its equation is

A. $x + y = -1$

B. $x + y = 3$

C. $x + 2y = 5$

D. $2x + y = 4$

Answer: D

Watch Video Solution

29. The equation to the sides of a triangle are x-3y = 0, 4x + 3y = 5 and 3x +y=0. The line 3x – 4y = 0 passes through

A. the incentre

B. the centroid

C. the orthocenter

D. the circumcenter

Answer: C

Watch Video Solution

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

A. x + 3y = 21

B. 2x – 3y = 7

C. x + 7y = 31

D. 2x + 3y = 21

Answer: C

Watch Video Solution

31. If $x_1, x_2, x(3)$as well as y_1, y_2, y_3 are in geometric progression with the same common ratio,then the points (x_(1),y_(1)),(x_(2),y_(2)),(x_(3),y_(3))`

A. lie on a parabola

B. lie on an ellipse

C. lie on a circle

D. straight line

Answer: D

Watch Video Solution

32. The distance between the pair of parallel lines $x^2 + 4xy + 4y^2 + 3x + 6y - 4 = 0$ is

A. $\sqrt{5}$

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

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

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

Answer: A

Watch Video Solution

33. The locus of the point (x, y) which is equidistant from the points (a + b, b - a) and (a - b, a + b) is

A. ax = by

B. ax + by = 0

C. bx + ay = 0

D. bx - ay = 0

Answer: D

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34. If A(3,5), B(-5, - 4), C(7, 10) are the vertices of a parallelogram, taken in the order, then the co-ordinates of the fourth vertex are

A. (10, 19)

B. (15, 10)

C. (19,10)

D. (15, 19)

Answer: D

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35. ABC is a triangle with vertices A(-1,4), B(6,-2), and C(-2, 4). D, E and F are the points which divide each AB, BC, and CA respectively in the ratio 3:1 internally. Then the centroid of the triangle DEF is

A. (3, 6)

B. (1, 2)

C. (4, 8)

D. (-3, 6)

Answer: B

Watch Video Solution

36. If the pairs of lines $x^2-2nxy-y^2=0$ and $x^2-2mxy-y^2=0$ are such that one of them represents the bisectors of the angles between the other, then

A. $\frac{1}{n}+\frac{1}{m}=0$

B. $\frac{1}{n}-\frac{1}{m}=0$

C. nm - 1 = 0

D. mn + 1 = 0

Answer: D

Watch Video Solution

37. The angle between the pair of straight lines $y^2 \sin^2\theta - xy\sin^2\theta + x^2(\cos^2\theta - 1) = 0$ is

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

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

C. $\frac{\pi}{6}$

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

Answer: D

Watch Video Solution

38. If the equation of base of an equilateral triangle is 2x - y = 1 and the vertex is (-1, 2), then the length of the side of

the triangle is

A. $\sqrt{\frac{20}{3}}$

B. $\frac{2}{\sqrt{15}}$

C. $\sqrt{\frac{8}{15}}$

D. $\sqrt{\frac{15}{2}}$

Answer: A

Watch Video Solution

39. The image of the origin with reference to the line 4x + 3y - 25 = 0 is

A. (-8, 6)

B. (8, 6)

C. (-3, 4)

D. (8, -6)

Answer: B

Watch Video Solution

40. The position of reflection of the point (4, 1) about the line y = x - 1 is

A. (1, 2)

B. (3, 4)

C. (-1, 0)

D. (2, 3)

Answer: D

Watch Video Solution

41. The line $2x - y = 1$ bisects angle between two lines. If equation of one line is $y = x$, then the equation of the other line is

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

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

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

D. $x - 7y + 6 = 0$

Answer: A

Watch Video Solution

42. The ratio in which the line $x+y=4$ divides the line joining the points $(-1, 1)$ and $(5, 7)$ is

A. 1:2

B. 2:1

C. 1:3

D. 3:1

Answer: A

Watch Video Solution

43. The angle between the lines $\sqrt{3}x - y - 2 = 0$ and $x - \sqrt{3}y + 1 = 0$ is

A. 90°

B. 60°

C. 45°

D. 30°

Answer: D

Watch Video Solution

44. Let Q(a, b) be a point on the line x+y=1. Then the equation of a set of points P(x, y) such that its distance

from the line x+y= 1 is equal to its distance from the point Q(a,b) is

A. x + y - a - b = 0

B. x - y +a - b=0

C. x - y - a + b = 0

D. x + y + a + b = 0

Answer: C

Watch Video Solution

45. The equation of the line passing through the origin and the point of intersection of the lines $\frac{x}{a}+\frac{y}{b}=1$ and $\frac{x}{b}+\frac{y}{a}=1$ is

A. bx - ay = 0

B. x + y = 0

C. ax – by = 0

D. x - y = 0

Answer: D

Watch Video Solution

46. The vertices A, B, C of a triangle are (2, 1), (5, 2) and (3, 4) respectively. Then the circumcentre is

A. $\left(\frac{13}{4}, \frac{-9}{4}\right)$

B. $\left(\frac{-13}{4}, \frac{9}{4}\right)$

C. $\left(\frac{-13}{4}, \frac{-9}{4}\right)$

D. $\left(\frac{13}{4}, \frac{9}{4}\right)$

Answer: D

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47. The x-axis, y-axis and a line passing through the point A(6,0) form a triangle ABC. If $\angle A = 30^\circ$, then the area of the triangle in sq.units, is

A. $6\sqrt{3}$

B. $12\sqrt{3}$

C. $4\sqrt{3}$

D. $8\sqrt{3}$

Answer: A

Watch Video Solution

48. The equations of the lines through the point (3, 2) which makes an angle of 45° with the line x - 2y = 3 are

A. 3x - y = 7 and x + 3y = 9

B. x – 3y = 7 and 3x + y = 9

C. x - y = 3 and x + y = 2

D. 2x + y = 7 and x - 2y = 9

Answer: A

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49. The straight lines $3x + 4y - 5 = 0$ and $4x - 3y = 15$ intersect at the point P. On these lines the points Q and R are chosen so that PQ = PR. The slopes of the lines QR passing through (1, 2) are

A. -7, $\frac{1}{7}$

B. 7, $\frac{1}{7}$

C. 7, $-\frac{1}{7}$

D. 3, $-\frac{1}{3}$

Answer: A

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50. The equation of the line which is such that the portion of line segment intercepted between the coordinate axes is bisected at (4, -3) is

A. $3x + 4y = 24$

B. $3x - 4y = 12$

C. $3x - 4y = 24$

D. $4x - 3y = 24$

Answer: C

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51. In ΔABC, a= 13 cm, b=12 cm and c=5 cm. Then the distance of A from BC is

A. $\frac{25}{13}$ cm

B. $\frac{60}{13}$ cm

C. $\frac{65}{12}$ cm

D. $\frac{144}{13}$ cm

Answer: B

Watch Video Solution

52. The equation of a line through the point (1, 2) whose distance from the point(3, 1) has the greatest value, is

A. $y = 2x$

B. $y = x + 1$

C. $x + 2y = 5$

D. $y = 3x - 1$

Answer: A

Watch Video Solution

53. If a line with y - intercept 2 is perpendicular to the lines $3x - 2y = 6$, then its x - intercept is

A. 1

B. 2

C. -4

D. 3

Answer: D

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54. If the lines ax + ky + 10 = 0, bx + (k + 1) y + 10 = 0 and cx + (k+2)y + 10 = 0 are concurrent, then

A. a, b, c are in G.P.

B. a, b, c are in H.P

C. a, b, c are in A.P

D. $(a+b)^2 = c$

Answer: C

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55. The lines (a +2b)x +(a – 3b)y= a - b for different values of a and b pass through the fixed point whose coordinates are

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

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

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

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

Answer: D

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56. A line passes through the point of intersection of the lines $100x + 50y-1=0$ and $75x + 25y + 3 = 0$ and makes equal intercepts on the axes. Its equation is

A. $25x + 25y - 1 = 0$

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

C. $25x + 25y-4 = 0$

D. $25x - 25y + 6 = 0$

Answer: C

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57. The circumcentre of the triangle with vertices (0, 30), (4,0) and (30,0) is

A. (10,10)

B. (10, 12)

C. (12, 12)

D. (17, 17)

Answer: D

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58. A line has slope m and y-intercept 4. The distance between the origin and the line is equal to

A. $\frac{4}{\sqrt{1-m^2}}$

B. $\frac{4}{\sqrt{m^2-1}}$

C. $\frac{4}{\sqrt{m^2+1}}$

D. $\frac{4m}{\sqrt{1+m^2}}$

Answer: C

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59. One side of length 3a of a triangle of area a^2 square units lies on the line x = a. Then one of the lines on which the third vertex lies, is

A. $x = -a^2$

B. $x = a^2$

C. x = -a

D. $x = \frac{a}{3}$

Answer: D

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60. The distance of the point (1, 2) from the line x + y + 5 = 0 measured along the line parallel to 3x - y = 7 is equal to

A. $4\sqrt{10}$

B. 40

C. $\sqrt{40}$

D. $10\sqrt{2}$

Answer: C

Watch Video Solution

61. If the lines y = 3x + 1 and 2y = x + 3 are equally inclined to the line y = mx + 4, $\left(\frac{1}{2} < m < 3\right)$, then the values of m are

A. $\frac{1}{7}(1 \pm 5\sqrt{3})$

B. $\frac{1}{7}(1 \pm 5\sqrt{5})$

C. $\frac{1}{7}(1 \pm 5\sqrt{2})$

D. $\frac{1}{7}(1 \pm 3\sqrt{2})$

Answer: D

Watch Video Solution

62. The vertices of a triangle are (3, 0), (3,3) and (0, 3). Then the coordinates of the circumcentre are

A. (0, 0)

B. (1, 1)

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

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

Answer: D

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63. If the distance between (2, 3) and (-5, 2) is equal to the distance between (x, 2) and (1,3), then the values of x are

A. -6, 8

B. 6, 8

C. -8, 6

D. -7, 7

Answer: A

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64. If the three points (0, 1), (0, -1) and (x, 0) are vertices of an equilateral triangle, then the values of x are

A. $\sqrt{3}, \sqrt{2}$

B. $\sqrt{3}, \ -\sqrt{3}$

C. $-\sqrt{5}, \sqrt{3}$

D. $\sqrt{2}, \ -\sqrt{2}$

Answer: B

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65. If the line px - qy = r intersects the co-ordinate axes at (a,0) and (0, b), then the value of a + b is equal to

A. $r\left(\frac{q+p}{pq}\right)$

B. $r\left(\frac{q-p}{pq}\right)$

C. $r\left(\frac{p-q}{pq}\right)$

D. $r\left(\frac{p+q}{p-q}\right)$

Answer: B

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66. The vertices of a triangle are A(3, 7), B(3, 4) and C(5, 4).

The equation of the bisector of the angle $\angle ABC$ is

A. y=x+1

B. y = x - 1

C. y = 3x - 5

D. y = x

Answer: A

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67. The equation of a straight line which passes through the point $(a\cos^3\theta, a\sin^3\theta)$ and perpendicular to $x\sec\theta + y\cos ec\theta = a$

A. $\frac{x}{a} + \frac{y}{a} = a\cos\theta$

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

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

D. $x\cos\theta + y\sin\theta - a\cos 2\theta = 1$

Answer: B

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68. The slopes of the lines which make an angle 45° with the line 3x - y = -5 are

A. 1, -1

B. $\frac{1}{2}$, -1

C. 1, $\frac{1}{2}$

D. -2, $\frac{1}{2}$

Answer: D

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69. The equation of one of the lines parallel to 4x – 3y=5 and at a unit distance from the point (-1,-4) is

A. 3x + 4y - 3 = 0

B. 3x + 4y + 3 = 0

C. 4x – 3y +3= 0

D. 4x - 3y - 3 = 0

Answer: D

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70. The distance between the points $(a\cos\alpha, a\sin\alpha)$ and $(a\cos\beta, a\sin\beta)$ is

A. $2\left|\sin\left(\frac{\alpha-\beta}{2}\right)\right|$

B. $2\left|a\sin\left(\frac{\alpha-\beta}{2}\right)\right|$

C. $2\left|a\cos\left(\frac{\alpha-\beta}{2}\right)\right|$

D. $\left|a\cos\left(\frac{\alpha-\beta}{2}\right)\right|$

Answer: B

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71. The vertices of the rectangle ABCD are A(-1,0), B(2, 0), C(a, b) and D(-1, 4). Then the length of the diagonal AC is

A. 2

B. 3

C. 4

D. 5

Answer: D

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72. If a straight line passes through the points $\left(\frac{-1}{2}, 1\right)$ and (1, 2), then its x-intercept is

A. -2

B. -1

C. 2

D. 1

Answer: A

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73. The line parallel to the x-axis and passing through the intersection of the lines ax + 2by + 3b = 0 and bx – 2 ay – 3a = 0, where $(a, b) \neq (0, 0)$ is

A. above the x-axis at a distance of $\frac{3}{2}$

B. above the x-axis at a distance of $\frac{2}{3}$

C. below the x-axis at a distance of $\frac{2}{3}$

D. below the x-axis at a distance of $\frac{3}{2}$.

Answer: D

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74. The line L has intercepts a and b on the coordinate axes. Keeping the origin fixed, the coordinate axes are rotated through a fixed angle. If the line L has intercepts p and q on the rotated axes, then $\frac{1}{a^2}+\frac{1}{b^2}$ is equal to

A. p^2+q^2

B. p^2-q^2

C. $\frac{1}{p^2}+\frac{1}{q^2}$

D. $\frac{1}{p^2}-\frac{1}{q^2}$

Answer: C

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75. The equation of the perpendicular bisector of the line segment joining A(-2, 3) and B(6,-5) is

A. $x - y = -1$

B. $x - y = 3$

C. $x + y = 3$

D. $x + y = 1$

Answer: B

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76. The vertices of the triangle PQR are P(0, b), Q(0, 0) and R(a, 0). If the medians PM and QN of PQR are

perpendicular, then

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

B. $b^2 = a^2$

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

D. a = b

Answer: C

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77. The slope of the straight line which does not intersect x-axis is equal to

A. $\frac{1}{2}$

B. $\frac{1}{\sqrt{2}}$

C. $\sqrt{3}$

D. 0

Answer: D

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78. If the distance between the two points (-1, a) and (-1, -4a) is 10 units, then the values of a are

A. ± 1

B. ± 2

C. ± 3

D. ± 4

Answer: B

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79. If the slope of the line joining the points (3, 4) and (-2, a) is equal to $\frac{-2}{5}$ then the value of a is equal to

A. 6

B. 4

C. 3

D. 2

Answer: A

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80. The equation of the line perpendicular to the line $2x - 3y + 5 = 0$ and making an intercept 3 with y-axis is

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

B. $3x + 2y - 12 = 0$

C. $3x - 2y - 6 = 0$

D. $3x + 2y + 6 = 0$

Answer: A

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81. The perpendicular distance from the point (1,-1) to the line x + 5y-9=0 is equal to

A. $\sqrt{\frac{2}{13}}$

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

C. $\frac{13}{2}$

D. $\frac{2}{13}$

Answer: B

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82. The angle between the lines 2x+11y-7=0 and x + 3y + 5 = 0) is equal to

A. $\tan^{-1}\frac{17}{31}$

B. $\tan^{-1}\frac{11}{35}$

C. $\tan^{-1}\frac{1}{7}$

D. $\tan^{-1}\frac{33}{35}$

Answer: C

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83. The distance between the parallel lines 5x - 12y - 14 = 0 and 5x - 12y + 12 = 0 is equal to

A. $\frac{1}{13}$

B. 2

C. $\frac{2}{13}$

D. 4

Answer: B

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84. The orthocentre of a triangle formed by the lines x - 2y = 1, x = 0 and 2x + y - 2 = 0 is

A. (0, 1)

B. (1, 0)

C. (-1, -2)

D. (1, 2)

Answer: B

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85. Let O be the origin and A be the point (64,0). If P, Q divide OA in the ratio 1:2:3, then the point P is

A. $\left(\frac{32}{3}, 0\right)$

B. (32, 0)

C. $\left(\frac{64}{3}, 0\right)$

D. $(16, 0)$

Answer: A

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86. The locus of a point which is equidistant from the points (1, 1) and (3, 3) is

A. $y = x + 4$

B. $x + y = 4$

C. $x = 2$

D. $y = 2$

Answer: B

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87. The value of a for which the points (9, 5), (1, 2), (a, 8) are collinear is equal to

A. 17

B. 8

C. 7

D. 71

Answer: A

88. A straight line with slope 3 intersects a straight line with slope 6 at the point (30,40). Then the difference between the y-intercepts of the straight lines is

A. 60

B. 70

C. 80

D. 90

Answer: D

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89. If the equation 3x + 3y + 5 = 0 is written in the form $x\cos\alpha + y\sin\alpha = p$, then the value of $\sin\alpha + \cos\alpha$ is

A. $\sqrt{2}$

B. $\frac{1}{\sqrt{2}}$

C. $-\sqrt{2}$

D. $-\frac{1}{\sqrt{2}}$

Answer: C

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90. The points on the line x + y = 4 lying at a unit distance from the line 4x+3y-10=0 are

A. (-7, 11), (3, 1)

B. (7, -11), (3, -1)

C. (-7, 11), (-3, 7)

D. (7, -3), (21, -7)

Answer: A

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91. If the straight lines y = 2x, y = 2x + 1, y= -7x, y= -7x+ 1 form a parallelogram, then the area of the parallelogram (in square units) is

A. $\frac{1}{3}$

B. $\frac{2}{9}$

C. $\frac{1}{9}$

D. $\frac{1}{4}$

Answer: C

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92. The number of solutions for the system of equations $2x + y = 4$, $3x + 2y = 2$, and $x+y = -2$ is

A. 1

B. 2

C. 3

D. infinitely many

Answer: A

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93. The points (2, 5) and (5, 1) are the two opposite vertices of a rectangle. If the other two vertices are points

on the straight line $y = 2x + k$, then the value of k is

A. 4

B. 3

C. -4

D. -3

Answer: C

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94. The orthocentre of the triangle whose vertices are (5,-2), (-1, 2) and (1,4) is

A. (2, -1)

B. (1, -2)

C. (5, 2)

D. (2, 5)

Answer: C

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95. The ratio by which the line $2x + 5y - 7 = 0$ divides the straight line joining the points (-4, 7) and (6, -5) is

A. 1 : 4

B. 1 : 2

C. 1 : 1

D. $2:03$

Answer: C

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96. If p is the length of the perpendicular from the origin to the line whose intercepts will the coordinate axes are $\frac{1}{3}$ and $\frac{1}{4}$ then the value of p is

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

B. $\frac{1}{12}$

C. 5

D. $\frac{1}{5}$

Answer: D

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97. A straight line perpendicular to the $2x + y = 3$ is passing through $(1, 1)$. Its y-intercept is

A. 1

B. 2

C. 3

D. $\frac{1}{2}$

Answer: D

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98. If

$x \sin^3 \theta + y \cos^3 \theta = \sin \theta \cos \theta$ and $x \sin \theta = y \cos \theta$

then $x^2 + y^2$ is

A. $5a^2$

B. $4a^2$

C. $3a^2$

D. a^2

Answer: D

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99. If the pair of lines

$ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$

intersect on the y-axis then

A. $2fgh = bg^2 + ch^2$

B. $bg^2 \neq ch^2$

C. abc = 2fgh

D. None of these

Answer: A

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100. The point of lines represented by $3ax^2 + 5xy + (a^2 - 2)y^2 = 0$ and perpendicular to each other for

A. two values of a

B. $\forall$ a

C. for one value of a

D. for no values of a

Answer: A

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101. Locus of midpoint of the portion between the axes of $x\cos\alpha + y\sin\alpha = p$ where pis constant is

A. $x^2 + y^2 = \frac{4}{p^2}$

B. $x^2 + y^2 = 4p^2$

C. $\frac{1}{x^2} + \frac{1}{y^2} = \frac{2}{p^2}$

D. $\frac{1}{x^2} + \frac{1}{y^2} = \frac{4}{p^2}$

Answer: D

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102. A triangle with vertices (4, 0), (-1, -1), (3, 5) is

A. isosceles and right angled

B. isosceles but not right angled

C. right angled but not isosceles

D. neither right angled nor isosceles

Answer: A

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103. A square of side a lies above the x-axis and has one vertex at the origin. The side passing through the origin makes and angle α $(0 < \alpha < \frac{\pi}{4})$ 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. $y(\cos\alpha + \sin\alpha) + x(\cos\alpha - \sin\alpha) = a$

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

Answer: C

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104. If the pairs of straight lines $x^2 - 2pxy - y^2 = 0$ and $x^2 - 2qxy - y^2 = 0$ be such that each pair bisects the angle between the other pair, then

A. p = -q

B. pq = 1

C. pq = -1

D. p = q

Answer: C

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105. Locus of centroid of the triangle whose vertices are (a cost, a sint), (b sint,b cost) and (1, 0), where t is a parameter, is

A. $(3x-1)^2+(3y)^2=a^2+b^2$

B. $(3x+1)^2+(3y)^2=a^2+b^2$

C. $(3x+1)^2+(3y)^2=a^2+b^2$

D. $(3x-1)^2+(3y)^2=a^2-b^2$

Answer: A

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106. Show that the area of the triangle formed by the lines

$y=m_1x+c_1, y=m_2x+c_2$ and $x=0$ is $\frac{(c_1-c_2)^2}{2|m_1-m_2|}$

A. $a_1^1+a_2^2+b_1^2-b_2^2$

B. $\frac{1}{2}(a_1^2+a_2^2+b_1^2+b_2^2)$

C. $\sqrt{a_1^2+b_1^2-a_2^2-b_2^2}$

D. $\frac{1}{2}\left(a_2^2+b_2^2-a_1^2-b_1^2\right)$

Answer: D

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107. 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. 3x + 2y = 5

B. 2x - 3y = 7

C. 2x + 3y = 9

D. 3x – 2y = 3

Answer: C

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108. The equation of the straight line passing through the point (4, 3) and making intercepts on the coordinate 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: D

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109. If the sum of the slopes of the lines given by $x^2 - 2cxy - 7y^2 = 0$ is four times their product, then c has the value

A. 2

B. -1

C. 1

D. -2

Answer: A

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110. If one of the lines given by $6x^2 - xy + 4cy^2 = 0$ is 3x + 4y = 0 then c equals

A. 3

B. -1

C. 1

D. -3

Answer: D

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111. The line parallel to the x-axis and passing through the intersection of the lines ax + 2by + 3b = 0 and bx – 2 ay – 3a = 0, where $(a, b) \neq (0, 0)$ is

A. below the x-axis at a distance of $\frac{2}{3}$ from it

B. below the x-axis at a distance of $\frac{3}{2}$ from it

C. above the x-axis at a distance of $\frac{2}{3}$ from it

D. above the x-axis at a distance of $\frac{3}{2}$ from it

Answer: B

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112. If non-zero numbers a, b, c are in H.P., then the straight line $\frac{x}{a}+\frac{y}{b}+\frac{1}{c}=0$ always passes through a fixed point. That point is

A. (-1, -2)

B. (-1, 2)

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

D. (1, -2)

Answer: D

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113. If a vertex of a triangle is (1, 1) and the mid points of two sides through this vertex are (-1, 2) and (3, 2), then the centroid of the triangle is

A. $\left(\frac{-1}{3}, \frac{7}{3}\right)$

B. $\left(-1, \frac{7}{3}\right)$

C. $\left(\frac{1}{3}, \frac{7}{3}\right)$

D. $\left(1, \frac{7}{3}\right)$

Answer: D

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114. If the pair of lines $ax^2 + 2(a+b)xy + by^2 = 0$ lie along diameters of a circle and divide the circle into four sectors such that the area of one of the sectors is thrice the area of another sector then

A. $3a^2 - 2ab + 3b^2 = 0$

B. $3a^2 - 10ab + 3b^2 = 0$

C. $3a^2 + 2ab + 3b^2 = 0$

D. $3a^2 + 10ab + 3b^2 = 0$

Answer: C

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

A. x + y = 7

B. 3x – 4y + 7 = 0

C. 4x + 3y = 24

D. 3x + 4y= 25

Answer: C

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116. In are ellispe , the distance between its foci is 6 and its minor axis is 8 , then e is

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

B. $\frac{1}{2}$

C. $\frac{4}{5}$

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

Answer: A

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117. If (a, a^2) falls inside the angle made by the lines $y = \frac{x}{2}, x > 0$ and y = 3x, $x > 0$, then a belongs to

A. $\left(0, \frac{1}{2}\right)$

B. $(3, \infty)$

C. $\left(\frac{1}{2}, 3\right)$

D. $\left(-3, -\frac{1}{2}\right)$

Answer: C

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118. The equation of a tangent to the parabola $y^2 = 8x$ is y = x + 2. The point on this line from which the other

tangent to the parabola is perpendicular to the given tangent is

A. (2, 4)

B. (-2, 0)

C. (-1, 1)

D. (0, 2)

Answer: B

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119. Let A(h, k), B (1, 1) and C(2, 1) be the vertices of a right angled triangle with AC as its hypotenuse. If the area of

the triangle is 1 square unit, then the set of values which 'k' can take is given by

A. {-1, 3}

B. {-3, -2}

C. {1, 3}

D. {0, 2}

Answer: A

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

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

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

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

Answer: C

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121. If one of the lines of $my^2 + \left(1 - m^2\right)xy - mx^2 = 0$ is a bisector of the angle between the lines xy = 0, then m is

A. 1

B. 2

C. $\frac{-1}{2}$

D. -2

Answer: A

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122. 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. -4

B. 2

C. 2

D. -2

Answer: A

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