MATHS

BOOKS - TARGET MATHS (HINGLISH)

STRAIGHT LINE

Classical Thinking

1. The number of lines which are equally inclined to the axes is :

A. 4

B. 2

C. 3

D. 1

Answer: B

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2. Angle made by the line passsing through $(1, 0)$ and $(-2, \sqrt{3})$ with x-axis is

A. 60°

B. 120°

C. 150°

D. 135°

Answer: C

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3. The equation of a line passing through $(4, -6)$ and making an angle 45° with positive X-axis, is

A. $x - y - 10 = 0$

B. $x - 2y - 16 = 0$

C. $x - 3y - 22 = 0$

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

Answer: A

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4. The equation of the line through the origin and perpendiculr to the line joining $(a, 0)$ and $(-a, 0)$ is

A. $y = 0$

B. $x = 0$

C. $x = -a$

D. $y = -a$

Answer: B

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5. If the co-ordinates of A and B are $(1, 1)$ and $(5, 7)$, then the Slope of the perpendicular line of the line segment AB is

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

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

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

D. $-\frac{3}{2}$

Answer: B

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6. The equation of the line bisecting the line segment joining the points (a, b) and (a', b') at right angle, is

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

B. $(a0a)x + (b - b')y = a^2 + b^2 - a'^2 - b'^2$

C. $2(a-b)x+2(b-b')y=a^{'2}+b^{'2}-a^{'2}-b^{'2}$

D. None of these

Answer: A

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7. The equation of a line which bisects the line joining two points $(2, -19)$ and $(6, 1)$ and perpendicular to the line joining two points $(-1, 3)$, and $(5, -1)$, is

A. $3x-2y=30$

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

C. $2x+3y=20$

D. None of these

Answer: A

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8. 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

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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9. The equation of a line joning the origin to the point $(-4, 5)$ is

A. $5x + 4y = 0$

B. $3x + 4y = 2$

C. $5x - 4y = 0$

D. $4x - 5y = 0$

Answer: A

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10. The equation of a straight line passing through the points $(-5, -6)$ and $(3, 10)$ is

A. $x - 2y = 4$

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

C. $2x + y = 4$

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

Answer: B

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11. The equation of a line through the intersection of lines $x = 0$ and $y = 0$ and through the point $(2, 2)$ is

A. $y = x - 1$

B. $y = -x$

C. $y = x$

D. $y = -x + 2$

Answer: C

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12. A straight line makes an angle of 135° with the X-axis and cuts Y-axis at a distance -5 from the origin. The equation of the line is

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

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

C. $x + y + 5 = 0$

D. $x + y + 3 = 0$

Answer: C

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13. The equatio of the line whose slope is 3 and which cuts off an intercept 3 from the positive X-axis is

A. $y = 3x - 9$

B. $y = 3x + 3$

C. $y = 3x + 9$

D. None of these

Answer: A

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14. The equatio of the line which cutrs off an intercept 3 units on OX and an intercept -2 units on OY is

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

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

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

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

Answer: A

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15. The equation of the line which cuts off intercepts $2a\sec\theta$ and $2a\,\text{cosec}\theta$ on X-axis and Y-axis respectively is

A. $x\sin\theta + y\cos\theta - 2a = 0$

B. $x\cos\theta + y\sin\theta - 2a = 0$

C. $x\sec\theta + y\,\text{cosec}\theta - 2a = 0$

D. $x\cos ec\theta + y\sec\theta - 2a = 0$

Answer: B

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16. The equation of line whose midpoint (x_1, y_1) is in between the axes, is

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

B. $\frac{x}{x_1} + \frac{y}{y_2} = \frac{1}{2}$

C. $\frac{x}{x_1} + \frac{y}{y_1} = 1$

D. None of these

Answer: A

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17. If the line $\frac{x}{a}+\frac{y}{b}=1$ passes through the points a $(2,\ -3)$ and $(4,\ -5)$, then $(a, b)=$

A. $(1, 1)$

B. $(-1, 1)$

C. $(1,\ -1)$

D. $(-1,\ -1)$

Answer: D

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18. The lines $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$ are perpendicular to each other , then _____.

A. $a_1b_2-b_1a_2=0$

B. $a_1a_2+b_1b_2=0$

C. $a_1^2b_2+b_1^2a_2=0$

D. $a_1b_1 + a_2b_2 = 0$

Answer: B

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19. The equation of line perpedicular to $x = c$ is

A. $y = d$

B. $x = d$

C. $x = 0$

D. None of these

Answer: A

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20. Slope of a line which cuts off intercepts of equal lengths on the axes is

A. -1

B. 0

C. 2

D. $\sqrt{3}$

Answer: A

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21. Equation of the line passing through $(1, 2)$ and parallel to the line $y = 3x - 1$ is

A. $y + 2 = x + 1$

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

C. $y - 2 = 3(x - 1)$

D. $y - 2 = x - 1$

Answer: C

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22. The equation of a line passing through (c, d) and parallel to $ax + by + c = 0$ is

A. $a(x + c) + (y + d) = 0$

B. $a(x + c) - b(y + d) = 0$

C. $a(x - c) + b(y - d) = 0$

D. $a(x - c) - b(y - d) = 0$

Answer: C

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

A. $4x + 3y = 24$

B. $y - 4 = x + 3$

C. $3y - 4x = 24$

D. $y + 4 = \frac{4}{3}(x - 3)$

Answer: D

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24. The equation of a line perpendicular to line $ax + by + c = 0$ and passing through (a, b) is equal to

A. $bx - ay = 0$

B. $bx + ay - 2ab = 0$

C. $bx + ay = 0$

D. $bx - ay + 2ab = 0$

Answer: A

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25. The equation of the line passing through the point (x', y') and perpendicular to the line y y'=2a (x+x')` is

A. $xy' + 2ay + 2ay' - x'y' = 0$

B. $xy' + 2ay - 2ay' - x'y' = 0$

C. $xy' + 2ay + 2ay' - x'y' = 0$

D. $xy' + 2ay - 2ay' + x'y' = 0$

Answer: B

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26. The acute angle between the lines y=3 and $y = \sqrt{3x} + 9$ is:

A. 30°

B. 60°

C. 45°

D. 90°

Answer: B

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27. Find the angle between the lines $y = \left(2 - \sqrt{3}\right)(x + 5)$ and $y = \left(2 + \sqrt{3}\right)(x - 7)$.

A. 30°

B. 60°

C. 45°

D. 90°

Answer: B

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28. The angle between the lines $x\cos 30^\circ + y\sin 30^\circ = 3$ and $x\cos 60^\circ + y\sin 60^\circ = 5$ is

A. 90°

B. 30°

C. 60°

D. 45°

Answer: B

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29. Find the tangent of the angel between the lines whose intercepts n the axes are respectively $a, \ -badnb, \ -a.$

A. $\tan^{-1}\frac{a^2+b^2}{ab}$

B. $\tan^{-1}\frac{b^2-a^2}{2}$

C. $\tan^{-1}\frac{b^2-a^2}{2ab}$

D. $\tan^{-1}\frac{b^2-a^2}{ab}$

Answer: C

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30. To which of the following types the straight lines represented by $2x+3y-7=0$ and $2x+3y-5=0$ belong

A. Parallel to each other

B. Perpendicular to each other

C. Inclined at 45° to each other

D. Coincident pair of straight lines

Answer: A

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

A. $3x - y + 7 = 0$ and $x + 3y + 9 = 0$

B. $3x - y - 7 = 0$ and $x + 3y - 9 = 0$

C. $x + 3y - 7 = 0$ and $x + 3y - 9 = 0$

D. None of these

Answer: B

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32. The angle between the lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = o,$ is

A. `tan^(-1)""(a _(1)b_(2)+a_(2)b_(2))/(a _(1)a _(2)-b_(1)b_(2)'

B. $\cot^{-1}\frac{a_1a_2+b_1b_2}{a_1b_2-a_2b_1}$

C. $\cot^{-1}, \frac{a_1b_1-a_2b_2}{a_1a_2+b_1b_2}$

D. $\tan^{-1}\frac{a_1b_1-a_2b_2}{a_1b_2+b_1b_2}$

Answer: B

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33. For the lines $2x+5y=7$ and $2x-5y=9$, which of the following statemetn is true ?

A. Lines are parallel

B. Lines are coincident

C. Lines are intercecting

D. Lines are perpendicular

Answer: C

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

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

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

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

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

Answer: A

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35. The value of k for which the lines $7x - 8y + 5 = 0, 3x - 4y + 5 = 0$ and $4x + 5y + k = 0$ are concurrent is given by

A. -45

B. 44

C. 54

D. -54

Answer: A

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36. Prove that the following sets of three lines are concurrent: $15x - 18y + 1 = 0,\ 12x + 10y - 3 = 0\ and\ 6x + 66y - 11 = 0.$

A. Parallel

B. Perpendicular

C. Concurrent

D. None of these

Answer: C

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37. If $u = a_1x + b_1y + c_1 = 0, v = a_2x + b_2y + c_2 = 0,$ and $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2},$ then the curve $u + kv = 0$ is the same straight line u different straight line not a straight line none of these

A. same straight line u

B. different straight line

C. not a stratight line

D. None of these

Answer: A

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38. The length iof perpendicular from $(3, 1)$on line $4x + 3y + 20 = 0,$ is

A. 6

B. 7

C. 5

D. 8

Answer: B

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39. The distance of the point $(-2, 3)$ from the line $x - y = 5$ is

A. $5\sqrt{2}$

B. $2\sqrt{5}$

C. $3\sqrt{5}$

D. $5\sqrt{3}$

Answer: A

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40. The perpendicular distance of the stratight line $12x + 5y = 7$ from the origin is

A. $\frac{7}{13}$

B. $\frac{12}{13}$

C. $\frac{5}{13}$

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

Answer: A

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41. The length of perpendicular from the point ($a\cos\propto$, $a\sin\propto$) upon the striaght line y = x $\tan\propto$ $+ c$ (where c gt 0) is

A. $c\cos\alpha$

B. $c\sin^2\alpha$

C. $c\sec^2\alpha$

D. $c\cos^2\alpha$

Answer: A

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42. If the length of the perpendicular drawn from the origin to the line whose intercepts on the axes are a and b be p, then

(A) $a^2+b^2=p^2$

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

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

(D) $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{p^2}$ Â Â Â

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

B. $a^2+b^2=\frac{1}{p^2}$

C. $\frac{1}{a^2}+\frac{1}{b^2}=\frac{2}{p^2}$

D. $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{p^2}$

Answer: D

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43. The length of the perpendicular form the point (b,a) to the line $\frac{x}{a} - \frac{y}{b} = 1$ is

A. $\left| \frac{a^2 - ab + b^2}{\sqrt{a^2 + b^2}} \right|$

B. $\left| \frac{b^2 - ab + a^2}{\sqrt{a^2 + b^2}} \right|$

C. $\left| \frac{b^2 + ab - a^2}{\sqrt{a^2 + b^2}} \right|$

D. $\left| \frac{a^2 + ab + b^2}{\sqrt{a^2 + b^2}} \right|$

Answer: B

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44. The length of perpendicular drawn from origin on the line joining (x', y') and (x', y'), is

A. $\left| \frac{x'y'' + x''y'}{\sqrt{(x'' - x')^2 + (y'' - y')^2}} \right|$

B. $\left|\frac{x'y'' - x''y'}{\sqrt{(x'' - x')^2 + (y'' - y')^2}}\right|$

C. $\left|\frac{x'y'' + x''y'}{\sqrt{(x'' + x')^2 + (y'' + y')^2}}\right|$

D. $\left|\frac{x'y'' + x''y'}{\sqrt{(x'' - x')^2 + (y'' - y')^2}}\right|$

Answer: B

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45. distance between the lines $5x + 3y - 7 = 0$ and $15x + 9y + 14 = 0$

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

B. $\frac{13}{\sqrt{34}}$

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

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

Answer: C

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Critical Thinking

1. The side AB,BC,CD and DA of a quadrilateral are $x+2y=3, x=1, x-3y=4, 5x+y+12=0$ respectively. The angle between diagonas AC and BC is

A. 45°

B. 60°

C. 90°

D. 30°

Answer: C

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2. If a straight line through the origin bisects the line passing through the given points $(a\cos\alpha, a\sin\alpha)$ and $(a\cos\beta, a\sin\beta)$, then the lines are perpendicular are parallel have an angle between them of $\frac{\pi}{4}$ none of these

A. Perpendicular

B. Parallel

C. Angle between them is $\frac{\pi}{4}$

D. None of these

Answer: A

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3. The opposite vertices of a square are $(1, 2)$ and $(3, 8)$, then the equation of a diagonal of the square passing through the point $(1, 2)$, is

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

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

C. $3x + y + 1 = 0$

D. None of these

Answer: A

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4. Let PS be the median of the triangle with vertices $P(2, 2), Q(6, -1) and R(7, 3)$ Then equation of the line passing through $(1, -1)$ and parallel to PS is $2x - 9y - 7 = 0$ $2x - 9y - 11 = 0$ $2x + 9y - 11 = 0$ $2x + 9y + 7 = 0$

A. $2x - 9y - 7 = 0$

B. $2x - 9y11 = 0$

C. $2x + 9y - 11 = 0$

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

Answer: D

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5. The point P(a,b) lies on the straight line $3x + 2y = 13$ and the point $Q(b, a)$ lies on the straight line $4x - y = 5$, then the equation of the line PQ is

A. $x - y = 5$

B. $x + y = 5$

C. $x + y = -5$

D. $x - y = -5$

Answer: B

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6. If a line joining two points A(2,0) and B(3,1) is rotated about A in anti-clockwise direction 15°, then the equation of the line in the new position is

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

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

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

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

Answer: A

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7. The points $(1, 3)$ and $(5, 1)$ are the opposite vertices of a rectangle. The other two vartices lie on the line $y = 2x + c,$ then the value of c will be

A. 4

B. -4

C. 2

D. -2

Answer: B

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8. Equation of the hour hand at 4 O' clock is

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

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

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

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

Answer: C

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9. If the intercept of a line between the coordinate axes is divided by the point $(-5, 4)$ in the ratio $1:2,$ then find the equation of the line.

A. $5x + 8y + 60 = 0$

B. $8x - 5y + 60 = 0$

C. $2x - 5y + 30 = 0$

D. None of these

Answer: B

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10. The intercept cut off from Y-axis is twice that from X-axis by the line and line passes through $(1, 2),$ then its equation is

A. $2x + y = 4$

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

C. $2x - y = 4$

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

Answer: A

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11. A straight line moves so that the sum of the reciprocals of its intercepts on two perpendicular lines is constant then the line passes through-

A. A fixed point

B. A variable point

C. Origin

D. None of these

Answer: A

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12. A line passes through the point $(3, 4)$ and cuts off intercepts from the co-ordinates axes such that their sum is 14. The equation of the line is

A. $4x - 3y = 14$

B. $4x + 3y = 24$

C. $3x - 4y = 24$

D. $3x + 4y = 24$

Answer: B

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

A. $x + 2y = 5$

B. $x - y + 1 = 0$

C. $x + y - 3 = 0$

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

Answer: D

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

A. $x + 5y = 5$

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

C. $x - 5y = 5$

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

Answer: B

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15. If we reduce $3x + 3y + 7 = 0$ to the form $x\cos\alpha + y\sin\alpha = p,$ then the value of p is $\frac{7}{2\sqrt{3}}$ (b) $\frac{7}{3}$ (c) $\frac{3\sqrt{7}}{2}$ (d) $\frac{7}{3\sqrt{2}}$

A. $\frac{7}{2\sqrt{30}}$

B. $\frac{7}{3}$

C. $\frac{3\sqrt{7}}{2}$

D. $\frac{7}{3\sqrt{2}}$

Answer: D

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16. The equation of lines on which the perpendiculars from the origin make 30^0 angle with the x-axis and which form a triangle of area $\frac{50}{\sqrt{3}}$ with the axes are $\sqrt{3}x + y - 10 = 0$ $\sqrt{3}x + y + 10 = 0$ $x + \sqrt{3}y - 10 = 0$ (d) $x - \sqrt{3}y - 10 = 0$

A. $x + \sqrt{3}y \pm 10 = 0$

B. $\sqrt{3}x + y \pm 10 = 0$

C. $x \pm \sqrt{3}y - 10 = 0$

D. None of these

Answer: B

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17. A line through $A(-5, -4)$ meets the lines $x + 3y + 2 = 0, 2x + y + 4 = 0 and x - y - 5 = 0$ at the points $B, C and D$ rspectively, if $\left(\frac{15}{AB}\right)^2 + \left(\frac{10}{AC}\right)^2 = \left(\frac{6}{AD}\right)^2$ find the equation of the line.

A. $2x + 3y + 22 = 0$

B. $5x - 4y + 7 = 0$

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

D. None of these

Answer: A

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18. Angle made with the x-axis by a straight line drawn through (1, 2) so that it intersects $x + y = 4$ at a distance $\frac{\sqrt{6}}{3}$ from (1, 2) is 105^0 (b) 75^0 (c) 60^0 (d) 15^0

A. 30°

B. 45°

C. 60°

D. 75°

Answer: D

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19. distance of the lines $2x - 3y - 4 = 0$ from the point $(1, 1)$ measured paralel to the line $x + y = 1$ is

A. $\sqrt{2}$

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

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

D. 6

Answer: A

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20. Consider the equation $y - y_1 = m(x - x_1)$. If m and different lines ar drawn for different values of y_1, then :

A. The lines will pass through a single point

B. There wil be a set of parallel lines

C. There will be one line only

D. None of these

Answer: C

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21. If the lines $2x + 3ay - 1 = 0$ and $3x + 4y + 1 = 0$ are matually perpendicular, then the value of a will be

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

B. 2

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

D. -2

Answer: C

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22. The equation to the straight line passing through the point $(a\cos^3\theta, a\sin^3\theta)$ and perpendicular to the line $x\sec\theta + y\operatorname{cosec}\theta = a$ is

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

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

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

D. None of these

Answer: A

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23. The equation of the line parallel to the line $2x - 3y = 1$ and passing through the middle point of the line segment joining the points (1,3) and (1,-7),` is

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

B. $2x - 3y = 8$

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

D. $2x - 3y = 4$

Answer: B

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24. A line AB makes zero intercepts on X-axis and Y-axis and it is perpendicular to another line $CD, 3x + 4y + 6 = 0$. The equation of line AB is

A. $y = 4$

B. $4x - 3y + 8 = 0$

C. $4x - 3y = 0$

D. $4x - 3y + 6 = 0$

Answer: C

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25. The equations of the perpendicular bisectors of the sides $ABandAC$ of triangle ABC are $x - y + 5 = 0$ and $x + 2y = 0$, respectively. If the point A is $(1, \ -2)$, then find the equation of the line BC.

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

B. $14x - 23 + 40 = 0$

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

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

Answer: D

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26. The number of lines that are parallel to $2x + 6y - 7 = 0$ and have an intercept 10 between the coordinate axes is

A. 1

B. 2

C. 4

D. Infinitely many

Answer: B

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27. The angle between the lines $x\cos\alpha_1 + y\sin\alpha_1 = p_1$ and $x\cos\alpha_2 + y\sin\alpha_2 = p_2$ is

(A) $|\alpha_1 + \alpha_2|$ (B) $|\alpha_1 - \alpha_2|$ (C) $|2\alpha_1|$ (D) $|2\alpha_2|$

A. $\alpha_1 + \alpha_2$

B. $\alpha_1 - \alpha_2$

C. $2\alpha_1$

D. $2\alpha_2$

Answer: B

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28. If the co-ordinates of the vertices A,B,C of the triangle ABC are $(-4, 2), (12, -2)$ and $(8, 6)$ respectively, then $\angle B =$

A. $\tan^{-1}\left(-\frac{6}{7}\right)$

B. $\tan^{-1}\left(\frac{6}{7}\right)$

C. $\tan^{-1}\left(-\frac{7}{6}\right)$

D. $\tan^{-1}\left(\frac{7}{6}\right)$

Answer: D

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29. If the lines $y = \left(2 + \sqrt{3}\right)x + 4$ and $y = kx + 6$ are inclined at an angle 60° to each, other, then the value of k will be

A. 1

B. 2

C. -1

D. -2

Answer: C

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30. 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 find the values m

A. $\frac{1 + 3\sqrt{2}}{7}$

B. $\frac{1 - 3\sqrt{2}}{7}$

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

D. $\frac{1 \pm 5\sqrt{2}}{7}$

Answer: D

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31. Two equal sides of an isosceles triangle are given by $7x - y + 3 = 0$ and $x + y = 3$, and its third side passes through the point $(1, -10)$. Find the equation of the third side.

A. $3x - y - 31 = 0$ or $x + y + 7 = 0$

B. $3x - y + 7 = 0$ or $x + 3y - 31 = 0$

C. $3x + y + 7 = 0$ or $3y - 31 = 0$

D. Neither $3x + y + 7n$ or $x - 3y - 31 = 0$

Answer: C

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32. If vertices of a parallelogram are respectively $(0, 0), (1, 0), (2, 2)$ and $(1, 2)$ then angle between diagonals is

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

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

C. $\frac{3\pi}{2}$

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

Answer: B

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33. The point of intersection of the lines $\frac{x}{a}\frac{y}{b} = 1$ and $\frac{x}{b} + \frac{y}{a} = 1$ lines on the line

A. $x - y = 0$

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

C. $(lx + my)(a + b) = (l + m)ab$

D. All of these

Answer: D

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34. Show that the straight lines given by $(2+k)x+(1+k)y=5+7k$ for different values of k pass through a fixed point. Also, find that point.

A. Lines are parallel

B. Lines pass through the point $(-2, 9)$

C. Line pass through thr point $(2, -9)$

D. None of these

Answer: B

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35. The opposite angular points of a square are (3,4) a) and (1,-1). Then the co-ordinates of other two points are() bx + (a) D1, 9 (a) D(1) B(63) 2 2) th 1 9 1 5 2 2) 2 2 (c) D(394(,) 2' 2 (d) none of these

A. $D\left(\frac{1}{2}, \frac{9}{2}\right), B\left(-\frac{1}{2}, \frac{5}{2}\right)$

B. $D\left(\frac{1}{2}, \frac{9}{2}\right), B\left(\frac{1}{2}, \frac{5}{2}\right)$

C. $D\left(\frac{9}{2}, \frac{1}{2}\right), B\left(-\frac{1}{2}, \frac{5}{2}\right)$

D. None of these

Answer: C

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36. The lines

$(p-q)x+(q-r)y+(r-p)=0(q-r)x+(r-p)y+(p-q)=0, (x$

A. parallel

B. perpendicular

C. concurrent

D. None of these

Answer: C

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37. The value of λ for which the lines $3x + 4y = 5, 5x + 4y = 4\, and\, \lambda x + 4y = 6$ meet at a point is 2 b. 3 c. 1 d. 4

A. 2

B. 1

C. 4

D. 3

Answer: B

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38. If the lines $ax + y + 1 = 0, x + by + 1 = 0$ and $x + y + c = 0$, (a,b,c being distinct and different from 1) are concurrent, then $\frac{1}{1-a} + \frac{1}{1-b} + \frac{1}{1-c} =$

(A) 0 (B) 1 (C) $\frac{1}{a+b+c}$ (D) None of these

A. 0

B. 1

C. $\frac{1}{a+b+c}$

D. $3abc$

Answer: B

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39. The straight line passing through the point of intersection of the straight line $x + 2y - 10 = 0$ and $2x + y + 5 = 0$ is

A. $5x - 4y = 0$

B. $5x + 4y = 0$

C. $4x - 5y = 0$

D. $4x + 5y = 0$

Answer: B

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40. Which of the following lines is concurrent with the lines $3x + 4y + 6 = 0$ and $6x + 5y + 9 = 0$?

A. $2x + 3y + 5 = 0$

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

C. $7x + 9y + 3 = 0$

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

Answer: B

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41. The straight lines $x + 2y - 9 = 0, 3x + 5y - 5 = 0$, and $ax + by - 1 = 0$ are concurrent, if the straight line $35x - 22y + 1 = 0$ passes through the point (a, b) (b) (b, a) $(-a, -b)$ (d) none of these

A. (a, b)

B. (b, a)

C. $(a, -b)$

D. $(a, -b)$

Answer: A

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42. If $a+b+c=0$ and $p \neq 0$ then lines $ax+(b+c)y=p, bx+(c+a)y=p$ and $cx+(a+b)y=p$

A. do not intersect

B. intersect

C. are concurrent

D. perpendicular

Answer: A

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43. The equation of a line passing through the point if intersection of the lines

$4x - 3y - 1 = 0$ and $5x - 2y - 3 = 0$ and parallel to the line $2y - 3x + 2 = 0$ is

A. $x - 3y = 1$

B. $3x - 2y = 1$

C. $2x - 3y = 1$

D. $2x - y = 1$

Answer: B

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44. Find the equation of the straight line passing through the intersection of the lines $x - 2y = 1$ and $x + 3y = 2$ and parallel to

$3x + 4y = 0.$

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

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

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

D. $3x + 4y + 6 = 0$

Answer: C

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45. Find the equation of the straight line passing through the point of intersection of the lines $5x - 6y - 1 = 0 and 3x + 2y + 5 = 0$ and perpendicular to the line $3x - 5y + 11 = 0.$

A. $5x + 3y + 8 = 0$

B. $3x - 5y + 8 = 0$

C. $5x + 3y + 11 = 0$

D. $3x - 5y + 11 = 0$

Answer: A

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46. The equation of a line passing through the point of intersection of lines $x + 2y + 3 = 0$ and $3x + 4y + 7 = 0$ and perpendicular to the line $x - y + 9 = 0$ is

A. $x + y + 2 = 0$

B. $x - y - 2 = 0$

C. $x + y - 5 = 0$

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

Answer: A

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47. Find the equation of a line passing through point of intersection of lines $x + 2y + 5 = 0$ and $3x + 4y + 1 = 0$ and also passing through point $(3, 2)$?

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

B. $3x + 2y - 13 = 0$

C. $x + 3y + 13 = 0$

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

Answer: B

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48. The equation of a line passing through the point of intersection of line $2x + 3y + 1 = 0$ and $3x - 5y - 5 = 0$ and making an angle of 45° with positive X-axis is

A. $2x - 19y + 23 = 0$

B. $19x - 23y + 15 = 0$

C. $19x - 19y - 23 = 0$

D. $20x - 19y + 23 = 0$

Answer: C

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49. The equation of straight line passing through the point of intersection of the straight line $3x - y + 2 = 0$ and $5x - 2y + 7 = 0$ and having infinite slope is

A. $x = 2$

B. $x + y = 3$

C. $x = 3$

D. $x = 4$

Answer: C

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50. Three sides of a triangle are represented by the equation $x + y - 6 = 0, 2x + y - 4 = 0$ and $x + 2y - 5 = 0$. The co-ordinate of its orthocentre of

A. $(10, 11)$

B. $(2, 3)$

C. $(-2, -3)$

D. $(-11, -10)$

Answer: D

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51. A point equidistant from the line $4x + 3y + 10 = 0, 5x - 12y + 26 = 0$ and $7x + 24y - 50 = 0$is

A. $(1, -1)$

B. $(1, 1)$

C. $(0, 0)$

D. $(0, 1)$

Answer: C

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52. The product of the perpendiculars drawn from the points $\pm\sqrt{a^2 - b^2}, 0$ on the line $\frac{x}{a}\cos\theta + \frac{y}{b}\sin\theta = 1,$ is

A. a^2

B. b^2

C. $a^2 + b^2$

D. $a^2 - b^2$

Answer: B

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53. If $p\&q$ are lengths of perpendicular from the origin $x\sin\alpha + y\cos\alpha = a\sin\alpha\cos\alpha$ and $x\cos\alpha - y\sin\alpha = a\cos 2\alpha,$ then $4p^2 + q^2$

A. k

B. $2k$

C. k^2

D. $2k^2$

Answer: C

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54. The points on $x + y = 4$ that lie at a unit distance from the line $4x + 3y - 10 =$ are

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

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

C. $(-3, 1), (-7, 11)$

D. $(1, 3), (-7, 11)$

Answer: A

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55. The vertex of an equilateral triangle is $(2, -1)$ and the equation of its base is $x + 2y = 1$. The length of its sides is

A. $\frac{4}{\sqrt{15}}$

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

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

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

Answer: B

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56. .Find the equation of a straight line, which passes through the point (a, 0) and whose line L has intercepts a and b on the coordinate axis when the distance from the point (2a, 2a) is a.

A. $y - a = 0$ and $4x - 3y - 3a = 0$

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

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

D. None of these

Answer: C

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57. The equations of the lines passing through the point $(1, 0)$ and at a distance $\frac{\sqrt{3}}{2}$ from the origin, are

A. $\sqrt{3}, +y - \sqrt{3} = 0, \sqrt{3}x - y - \sqrt{4} = 0$

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

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

D. None of these

Answer: A

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58. Find the equations of the lines through the point of intersection of the lines $x - y + 1 = 0$ and$2x - 3y + 5 = 0$whose distance from the point$(3, 2)$ is $\frac{7}{5}$

A. $3x - 4y - 6 = 0$ and $4x + 3y + 1 = 0$

B. $3x - 4y + 6 = 0$ and $4x - 3y - 1 = 0$

C. $3x - 4y + 6 = 0$ and $4x - 3y + 1 = 0$

D. None of these

Answer: C

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59. a Find equation of a straight line on which length of perpendicular from the origin is four units and the line makes an angle of 120^0 with the positive direction of x-axis.

A. $x\sqrt{3}+y+8=0$

B. $x\sqrt{3}-y=-8$

C. $x\sqrt{3}-y=8$

D. $x-\sqrt{3}y+8=0$

Answer: A

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60. The distance between two parallel lines $3x+4y-8=0$ and $3x+4y-3=0,$ is given by

A. 4

B. 5

C. 3

D. 1

Answer: D

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61. if the equations $y = mx + c$ and $x\cos\alpha + y\sin\alpha = p$ represent the same straight line then:

A. $p = c\sqrt{1 + m^2}$

B. $c = p\sqrt{1 + m^2}$

C. $cp = \sqrt{1 + m^2}$

D. $p^2 + c^2 + m^2 = 1$

Answer: B

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

A. $5:3$

B. $3:7$

C. $2:3$

D. None of these

Answer: B

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63. The diagonals of the parallelogram whose sides are $lx+my+n=0$,$lx+my+n', =0,\ mx+ly+n=0,\ mx+ly+n'=0$ 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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64. The ends of the base of an isosceles 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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65. Equation of the line passing through the point $(-4, 3)$ and the portion of the line intercepted between the axes which is divided internally in the ratio $5:3$ by this point, is

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

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

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

D. None of these

Answer: C

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66. If the lines $ax + 2y + 1 = 0, bx + 3y + 1 = 0 and cx + 4y + 1 = 0$ are concurrent, then a, b, c are in a. A.P. b. G.P. c. H.P. d. none of these

A. A.P.

B. G.P.

C. H.P.

D. None of these

Answer: A

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67. The equation $(b - c)x + (c - a)y + (a - b) = 0$ and $\left(b^3 - c^3\right)x + \left(c^3 - a^3\right)y + a^3 - b^3 = 0$ will represent the same line if

A. $b = c$

B. $c = a$

C. $a = b$

D. $c = a$

Answer: D

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68. If $2p$ is the length of perpendicular from the origin to the lines $\frac{x}{a} + \frac{y}{b} = 1$, then $a^2, 8p^2, b^2$ are in

A. A.P.

B. G.P.

C. H.P.

D. None of these

Answer: C

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Competitive Thinking

1. The slope of a line that makes an angle of measure 30° with Y-axis is

A. $\sqrt{3}$

B. $-\sqrt{3}$

C. $\pm\sqrt{3}$

D. $\pm\frac{1}{\sqrt{3}}$

Answer: C

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2. The slope of astraight 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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3. The line passing through the points $(3, -4)$ and $(-2, 6)$ and a line passing through $(-3, 6)$ and $(9, -18)$

A. are perpendicular

B. are parallel

C. make an angle 60° with each other

D. none of these

Answer: B

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4. 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

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5. Thet equatio of the line passing through (a, b) and parallel to the line $\frac{x}{a} + \frac{y}{b} = 1$ is

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

B. $\frac{x}{a} + \frac{y}{b} = 2$

C. $\frac{x}{a} + \frac{y}{b} = 0$

D. $\frac{x}{a} + \frac{y}{b} + 2 = 0$

Answer: B

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6. find equation of the line parallel to the line $3x - 4y + 2 = 0$ and passing through the point $(-2, 3)$.

A. $3x - 4y + 18 = 0$

B. $3x - 4y - 18 = 0$

C. $3x + 4y + 18 = 0$

D. $3x + 4y - 18 = 0$

Answer: A

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7. The equation of the line passing through $(-3, 5)$ and perpendicular to the line through the points $(1, 0)$ and $(-4, 1)$ is

A. $5x + y + 10 = 0$

B. $3x - y + 20 = 0$

C. $5x - y - 10 = 0$

D. $5x + y + 20 = 0$

Answer: B

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8. The equation of the line bisecting perpendicularly the semgent joining the points (-4,6) and (8,8) is

A. $6x + y - 19 = 0$

B. $y = 7$

C. $6x + 2y - 19 = 0$

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

Answer: A

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

A. $x - y = -1$

B. $4x + y = 12$

C. $x + y = 3$

D. $x + y = 1$

Answer: B

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10. The points $A91, 3)$ and $C(5, 1)$ are the opposite vertices of a rectange. The equation of line passing through other two vertices and of gradient 2, is

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

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

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

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

Answer: B

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

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

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

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

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

Answer: C

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12. Find the equations of the diagonals of the square formed by the lines $x = o, y = 0, x = 1 and y = 1.$

A. $y = x, y + x = 1$

B. $y = x, x + y = 2$

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

D. $y = 2x, y + 2x = 1$

Answer: A

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

A. $3x - 2y = 0$

B. $2x - 3y = 0$

C. $3x + 2y = 0$

D. None of these

Answer: A

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14. If the three points A(1, 6), B(3, - 4) and C(x, y) are collinear, then the equation satisfying by x & y is

A. $5x + y - 11 = 0$

B. $5x + 13y + 5 = 0$

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

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

Answer: A

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15. Two consecutive sides of a parallelogram are $4x + 5y = 0$ and $7x + 2y = 0$. If the equation of one diagonal is $11x = 7y = 9$, find the equation of the other diagonal.

A. $x + 2y = 0$

B. $2x + y = 0$

C. $x - y = 0$

D. None of these

Answer: C

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16. Two sides of a rhombus are along the lines, x-y+1=0 and 7x-y-5=0. If its diagnols intersect at (-1,-2), then which one of the following is a vertex of a rhombus? a. $(-3, -9)$ b. $(-3, -8)$ c. $\left(\frac{1}{3}, -\frac{8}{3}\right)$ d. $\left(-\frac{10}{3}, -\frac{7}{3}\right)$

A. $(-3, -9)$

B. $(-3, -8)$

C. $\left(\frac{1}{3}, -\frac{8}{3}\right)$

D. $\left(-\frac{10}{3}, -\frac{7}{3}\right)$

Answer: C

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17. If a striaght 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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18. Find the equation of a line which passes through $(-3, 2)$ and makes intercepts equal in magnitude but opposite in sign on X and Y-axis.

A. $x - y + 5 = 0$

B. $x + y - 5 = 0$

C. $x - y - 5 = 0$

D. $x + y + 5 = 0$

Answer: A

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19. Equation of the straight line making equal intercepts on the axes and passing through the point $(2, 4)$ is

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

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

C. $x + y - 6 = 0$

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

Answer: C

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

Answer: A

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21. The straight line through a fixed point (2,3) intersects the coordinate axes at distinct point P and Q. If O is the origin and the rectangle OPRQ is completed then the locus of R is

A. $2x + 3y = xy$

B. $3x + 2y = xy$

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

D. $3x + 2y = 6$

Answer: B

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22. The equation to the line bisecting the join of (3,-4) and (5,2) and having intercepts on the x-axis and y-axis in the ratio of 2:1 is:

A. $x + y - 3 = 0$

B. $2x - y = 9$

C. $x + 2y = 2$

D. $2x + y = 7$

Answer: C

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23. If $\left(\frac{3}{2}, \frac{5}{2}\right)$ is the midpoint of line segment intercepted by a line between axes, the equation of the line is

A. $5x + 3y + 15 = 0$

B. $3x + 5y + 15 = 0$

C. $5x + 3y - 15 = 0$

D. $3x + 5y - 15 = 0$

Answer: C

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24. 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. $x + y = 7$

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

C. $4x + 3y = 24$

D. $3x + 4y = 25$

Answer: C

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25. Equation of the line through (α, β) which is the midpoint of the line intercepted between the coordinate axes is

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

B. $\frac{x}{\alpha} + \frac{y}{\beta} = 2$

C. $\frac{x}{\alpha} - y\beta = -1$

D. $\frac{x}{\alpha} - \frac{y}{\beta} = -2$

Answer: B

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

A. $6x + 9y = 5$

B. $9x + 6y = 5$

C. $4x + 9y = 5$

D. $9x + 4y = 5$

Answer: C

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28. If the portion of a line intercepted between the coordinate axes is divided by the point $(2, -10$ in the ratio $3:2.$ then the equation of that line is

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

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

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

D. $x - 3y - 5 = 9$

Answer: D

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

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

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

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

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

Answer: B

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30. A line is such that its segment between the straight lines $5x - y - 4 = 0$ and $3x + 4y - 4 = 0$ is bisected at the point $(1, 5)$, then its equation is

A. $83 - 35y + 92 = 0$

B. $35x - 83y + 92 = 0$

C. $35x + 35y + 92 = 0$

D. None of these

Answer: A

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31. The lines $y = 2x$ and $x = -2y$ are

A. parallel

B. perpendicular

C. equally inclined to axes

D. coincident

Answer: B

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32. Two line represented by equations $x + y = 1$ and $x + ky = 0$ are mutually orthogonal if k is

A. 1

B. -1

C. 0

D. None of these

Answer: B

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33. If the straight lines $2x + 3y - 3 = 0$ and $x + ky + 7 = 0$ are perpendicular, then the value of k is

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

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

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

D. $\frac{-2}{3}$

Answer: D

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34. If the line passing through $(4, 3) and (2, k)$ is parallel to the line $y = 2x + 3,$ then find the value of k.

A. -1

B. 1

C. -4

D. 4

Answer: D

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35. The medians BE and AD of a triangle with vertices $A(0, b), B(0, 0)$ and $C(a, 0)$ are perpendicular to each other, if .

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

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

C. Both (A) and (B)

D. None of these

Answer: C

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

A. $7x - y + 23 = 0$

B. $7y + x = 30$

C. $7y + x = 31$

D. $x - 7y = 30$

Answer: C

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37. For what values of $aandb$ the intercepts cut off n the coordinate axes by the line $ax + by + 8 = 0$ are equal in length but opposite in signs to those cut off by the line $2x - 3y + 6 = 0$ on the axes.

A. $a = \frac{8}{3}, b = -4$

B. $a = -\frac{8}{3}, b = -4$

C. $a = \frac{8}{3}, b = 4$

D. $a = -\frac{8}{3}, b = 4$

Answer: D

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38. The equation of the straight line passing through the point $(3, 2)$ and perpendicular to the line $y = x$ is

A. $x - y = 5$

B. $x + y = 5$

C. $x + y = 1$

D. $x - y = 1$

Answer: B

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39. The equation of the line passing through the point $(1, 2)$ and perpendicular to the line $x + y + 1 = 0$ is

A. $y - x + 1 = 0$

B. $y - x - 1 = 0$

C. $y - x + 2 = 0$

D. $y - x - 2 = 0$

Answer: B

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40. Equation of line passing through the point $(1, 2)$ and perpendicular to the line $y = 3x - 1$ is

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

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

C. $x + 3y = 0$

D. $x - 3y = 0$

Answer: A

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

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

B. $3(y - 1) = -2(x + 1)$

C. $y - 1 = 2(x + 1)$

D. $3(y - 1) = x + 1$

Answer: A

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42. Find the equation of the straight line passing through the point of intersection of the lines $5x - 6y - 1 = 0 and 3x + 2y + 5 = 0$ and perpendicular to the line $3x - 5y + 11 = 0$.

A. $5x + 3y + 18 = 0$

B. $-5x - 3y + 18 = 0$

C. $5x + 3y + 8 = 0$

D. $5x + 3y - 8 = 0$

Answer: C

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43. Find the equation of the line perpendicular to the line $\frac{x}{a} - \frac{y}{b} = 1$ and passing through a point at which it cuts the x-axis.

A. $\frac{x}{a} + \frac{y}{b} + \frac{a}{b} = 0$

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

C. $\frac{x}{b}+\frac{y}{a}=0$

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

Answer: D

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44. A line passes through the point $(2, 2)$ and is perpendicular to the line $3x + y = 3,$ then its y-intercept is

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

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

C. 1

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

Answer: A

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45. The equation of the line joining the centroid with the orthocentre of the triangle formed by the points $(-2, 3)(2, -1), (4, 0)$ is

A. $x + y - 2 = 0$

B. $11x - y - 14 = 0$

C. $x - 11y + 6 = 0$

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

Answer: B

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46. The equation of the straight line in the normal form which is parallel to the lines $x + 2y + 3 = 0$ and $x + 2y + 8 = 0$ and dividing the distance between these two lines in the ratio $1:2$ internally is

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47. The angle between the lines $x\cos\alpha + y\sin\alpha = a$ and $x\sin\beta - y\cos\beta = a$ is

$(i)\beta - \alpha (ii)\pi - \alpha + \beta (iii)\frac{\pi}{2} + \beta + \alpha (iv)\frac{\pi}{2} - \beta + \alpha$

A. $\beta - \alpha$

B. $\pi + \beta - \alpha$

C. $\frac{\pi}{2} + \beta + \alpha$

D. $\frac{\pi}{2} - \beta + \alpha$

Answer: D

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48. The angle between the lines $\frac{x}{a} + \frac{y}{b} = 1$ and $\frac{x}{a} - \frac{y}{b} = 1$ will be:

A. $2\tan^{-1}\frac{b}{a}$

B. $\tan^{-1}\frac{2ab}{a^2 + b^2}$

C. $\tan^{-1}\frac{a^2 - b^2}{a^2 + b^2}$

D. None of these

Answer: A

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49. Angle between $x = 2$ and $x - 3y = 6$ is

A. ∞

B. $\tan^{-1}(30$

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

D. None of these

Answer: B

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50. The paralelism condition for two straight lines one of which is speciified by the equation $ax + by + c = 0,$ the other being represented parmetrically by $x = \alpha t + \beta, y = \gamma t + \delta$ is given by

A. $\alpha\gamma - b\alpha = 0, \beta = \partial at = c = 0$

B. $a\alpha - b\gamma = 0, \beta = \delta = 0$

C. $a\alpha + b\gamma = 0$

D. $a\gamma = b\alpha = 0$

Answer: C

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51. The angle between the two lines $y - 2x = 9$ and $x + 2y = -7,$ is

A. 60°

B. 30°

C. 90°

D. 45°

Answer: C

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

A. 90°

B. 60°

C. 45°

D. 30°

Answer: A

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53. if $\frac{1}{ab'}+\frac{1}{ba'}=0$, then lines $\frac{x}{a}+\frac{y}{b}=1$ and $\frac{x}{b'}+\frac{y}{a'}=1$ are

A. Parallel

B. Inclined at 60° to each other

C. Perpendicular to each other

D. Inclined at 30° to each other

Answer: C

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54. A straight line L through the point (3,-2) is inclined at an angle 60° to the line $\sqrt{3}x+y=1$ If L also intersects the x-axis then the equation of L is

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

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

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

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

Answer: A

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55. The lines $x = 3, y = 4$ and $4x - 3y + a = 0$ are concurrent for a equal to

A. 0

B. -1

C. 2

D. 3

Answer: A

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

A. 1

B. 3

C. 6

D. 0

Answer: C

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57. The number of values of a for which the lines $2x + y - 1 = 0$, $ax + 3y - 3 = 0,$ and $3x + 2y - 2 = 0$ are concurrent is 0 (b) 1 (c) 2 (d) infinite

A. All a

B. $a = 4$ only

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

D. $a > 0$ only

Answer: A

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58. If the lines $ax + by + c = 0, bx + cy + a = 0$ and $cx + ay + b = 0$ be concurrent, then:

A. $a^3 + b^3 + c^3 + 3abc = 0$

B. $a^3 + b^3 + c^3 - abc = 0$

C. $a^3 + b^3 + c^2 - 3abc = 0$

D. None of these

Answer: C

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59. The lines ax + by + c = 0, where 3a + 2b + 4c= 0, are concurrent at the point 3 1 1 3 2'4

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

B. $(1, 3)$

C. $(3, 1)$

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

Answer: D

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60. If the lines $x + 3y - 9 = 0, 4x + by - 2 = 0,$ and $2x - 4 = 0$ are concurrent, then the equation of the lines passing through the point (b,0) and concurrent with the given lines, is

A. $2x + y + 10 = 0$

B. $4x - 7y + 20 = 0$

C. $x - y + 5 = 0$

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

Answer: D

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61. The line passing through the point of intersection of $x + y = 2, x - y = 0$ and is parallel to $x + 2y = 5$, is

A. $x + 2y = 1$

B. $x + 2y = 2$

C. $x + 2y = 4$

D. $x + 2y = 3$

Answer: D

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62. A line passes through the point of intersection of $2x + y = 5$ and $x + 3y + 8 = 0$ and paralled to the $3x + 4y = 7$ is

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

B. $3x + 4y = 0$

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

D. $4x - 3y = 3$

Answer: A

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

A. above the X-axis at a distance of 3/2 from it

B. above the X-axis at a distance of 2/3 from it

C. below the X-axis at a distance of 3/2 from it

D. below the X-axis at a distance of 2/3 from it

Answer: C

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64. Find the equation of the line passing through the point of intersection of the lines

(b) perpendicular to the line $7x + 2y - 5 = 0$

A. $2x - 7y - 20 = 0$

B. $2x + 7y - 20 = 0$

C. $-2x + 7y - 20 = 0$

D. $2x + 7y + 20 = 0$

Answer: A

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65. Equations of line which passes through the point of intersection of the $4x - 3y - 1 = 0$ and $2x - 5y + 3 = 0$ and are equally inclined to the axes are:

A. $y \pm x = 0$

B. $y - 1 = \pm 1(x - 1)$

C. $x - 1 = \pm 2(y - 1)$

D. $y \pm x = 2$

Answer: B

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66. A line passes through the point of intersection of the line $3x + y + 1 = 0$ and $2x - y + 3 = 0$ and makes equal intercepts with axes. Then, equation of the line is

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

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

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

D. $5x + 5y + 3 = 0$

Answer: A

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67. 12. If a and b are two arbitrary constants, then the straight line $(a - 2b)x + (a + 3b)y + 3a + 4b = 0$will pass through (A) (-1, -2) (B) (1,2) (C) (-2, -3) (D) (2,3)

A. $(-1, -2)$

B. $(1, 2)$

C. $(-2, -3)$

D. $(2, 3)$

Answer: A

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68. Find the distance of the point $(3, \quad 5)$ from the line $3x \quad 4y \quad 26 \quad = 0$.

A. $\frac{3}{7}$

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

C. $\frac{7}{5}$

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

Answer: D

Watch Video Solution

69. Let $a \neq 0, b \neq 0, cbe$ three real numbers and $L(p, q) = \frac{ap + bq + c}{\sqrt{a^2 + b^2}}, \forall p, q \in R.$ If $L\left(\frac{2}{3}, \frac{1}{3}\right) + L\left(\frac{1}{3}, \frac{2}{3}\right) + L(2, 2) = 0$, then the line $ax + by + c = 0$ always passes through the fixed point.

A. $(0, 1)$

B. $(1, 1)$

C. $(2, 2)$

D. $(-1, -1)$

Answer: B

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70. The length of the perpendicular drawn from orgin upon the straight line $\frac{x}{3} - \frac{y}{4} = 1$ is

A. $2\frac{2}{5}$

B. $3\frac{1}{5}$

C. $4\frac{2}{5}$

D. $3\frac{2}{5}$

Answer: A

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71. The length of the perpendicular from the origin on the line $\frac{x \sin \alpha}{b} - \frac{y \cos \alpha}{a} - 1 = 0$ is

A. $\frac{|ab|}{\sqrt{a^2 \cos^2 \alpha - \beta \sin^2 \alpha}}$

B. $\frac{|ab|}{\sqrt{a^2 \cos^2 \alpha + \beta \sin^2 \alpha}}$

C. $\frac{|ab|}{\sqrt{a^2 \sin^2 \alpha - \beta \cos^2 \alpha}}$

D. $\frac{|ab|}{\sqrt{a^2 \sin^2 \alpha + \beta \cos^2 \alpha}}$

Answer: D

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72. A straight line passes through the points $(5, 0)$ and $(0, 3)$. The length of perpendicular from the point $(4, 4)$ on the line is

A. $\frac{15}{\sqrt{34}}$

B. $\frac{\sqrt{17}}{2}$

C. $\frac{17}{2}$

D. $\sqrt{\frac{17}{2}}$

Answer: D

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73. If the perpendicular distance between the point $(1, 1)$ and the line $3x + 4y + c = 0$ is 7, then the possible values of c are

A. $-35, 42$

B. $35, 28$

C. $42, -28$

D. $28, -42$

Answer: D

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74. What are the points on the x-axis whose perpendicular distance from the line $\frac{x}{a}+\frac{y}{b}=1$ is a

A. $\left[\frac{a}{b}\left(b \pm \sqrt{a^2+b^2}\right), 0\right]$

B. $\left[\frac{b}{a}\left(b \pm \sqrt{a^2+b^2}\right), 0\right]$

C. $\left[\frac{a}{b}\left(a \pm \sqrt{a^2+b^2}\right), 0\right]$

D. None of these

Answer: A

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75. Two points A and B have coordinates $(1, 1)$ and $(3, -2)$ respectively. The co-ordinates of a point distant $\sqrt{85}$ from B on the line through B perpendicular to AB are

A. $(4, 7)$

B. $(7, 4)$

C. $(5, 7)$

D. $(-5, -3)$

Answer: C

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76. The vertices of a triangle are $(2, 1), (5, 2)$ and $(4, 4)$ The lengths of the perpendicular from these vertices on the opposite sides are

A. $\frac{7}{\sqrt{5}}, \frac{7}{\sqrt{13}}, \frac{7}{\sqrt{6}}$

B. $\frac{7}{\sqrt{6}}, \frac{7}{\sqrt{8}}, \frac{7}{\sqrt{10}}$

C. $\frac{7}{\sqrt{5}}, \frac{7}{\sqrt{8}}, \frac{7}{\sqrt{15}}$

D. $\frac{7}{\sqrt{5}}, \frac{7}{\sqrt{13}}, \frac{7}{\sqrt{10}}$

Answer: D

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77. the equation of line of the base of the equilateral triangle is $x+y=2$ and vertix $(2,\ -1)$ then length of the side is:

A. $\sqrt{3/2}$

B. $\sqrt{2}$

C. $\sqrt{2/3}$

D. None of these

Answer: C

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78. If the equation of the base of an equilateral triangle is $2x-y=1$ and the vertex is $(\ -1, 2),$ then the length of a 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

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79. P is a point on the line $y + 2x = 1,$ and $QandR$ two points on the line $3y + 6x = 6$ such that triangle PQR is an equilateral triangle. The length of the side of the triangle is $\frac{2}{\sqrt{5}}$ (b) $\frac{3}{\sqrt{5}}$ (c) $\frac{4}{\sqrt{5}}$ (d) none of these

A. $\frac{1}{\sqrt{15}}$

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

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

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

Answer: B

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80. The equation of the line passing through the point of intersection of the lines $2x + y - 4 = 0, x - 3y + 5 = 0$ and lying at a distance of $\sqrt{5}$ units from the origin, is

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

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

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

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

Answer: B

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81. A straight line makes an intercept on the Y-axis twice as along as that on X-axis and is at a unit distance from the origin. Then the line is represented by the equations

A. $2x + 3y = \pm\sqrt{5}$

B. $x + y \pm 2$

C. $x - y = \pm 2$

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

Answer: D

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82. The vertices of a $\triangle OBC$ are $O(0, 0), B(-3, -1), C(-1, -3)$. Find the equation of the line parallel to BC and intersecting the sides OB and OC and whose perpendicular distance from the origin is $\frac{1}{2}$.

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

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

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

D. None of these

Answer: A

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83. The equation of one of the line 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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84. The vertices of a triangle are $A(-1, -7), B(5, 1),$ and $C(1, 4)$. The equation of the bisector of $\angle ABC$ is___

A. $x = 7y + 2$

B. $7y = x + 2$

C. $y = 7x + 2$

D. $7x = y + 2$

Answer: B

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85. Number of points having distance $\sqrt{5}$ from the straight line x - 2y + 1 = 0 and a distance $\sqrt{13}$ from the line 2 x + 3y - 1 = 0 is _

A. 1

B. 2

C. 4

D. 5

Answer: C

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86. On the portion of the straight Straight Line from line $x + y = 2$ which is intercepted between the axes, a square is constructed away from the origin with this portion as on of its side. If p denotes the perpendicular distance of a side of this square from the origin, then the maximum value of p is A) $\sqrt{2}$ (B) $2\sqrt{2}$C) $3\sqrt{2}$ D) $4\sqrt{2}$

A. $3\sqrt{2}$

B. $2\sqrt{3}$

C. $\frac{2}{\sqrt{3}}$

D. $\frac{3}{\sqrt{2}}$

Answer: A

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87. The equation of straight line equally inclined to the axes and equidistant from the point $(1, -2)$ and $(3, 4)$ is:

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

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

C. $a = 1, b = 1, c = 2$

D. None of these

Answer: B

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88. The distance between the line $3x + 4y = 9$ and $6x + 8y = 15$ is

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

B. $\frac{3}{10}$

C. 6

D. None of these

Answer: B

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89. The distance between the parallel lines $y = x + a, y = x + b$ is

A. $\frac{|a - b|}{\sqrt{2}}$

B. $|a - b|$

C. $|a + b|$

D. $\frac{|a + b|}{\sqrt{2}}$

Answer: A

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90. 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. $\sqrt{17}$

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

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

Answer: D

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91. Let α be the distance between lines $-x+y=2$ and $x-y=2$ and β be the distance between the lines $4x-3y=5$ and $6y-8x=1$, then

A. $20\sqrt{2}\beta=11\alpha$

B. $20\sqrt{2}\alpha=11\beta$

C. $11\sqrt{2}\beta=20\alpha$

D. None of these

Answer: A

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92. The line $(k+1)x + ky - 2k^2 - 2 = 0$ passes through a point regardless of the value k. Which of the following is the line with slope 2 passing through the point?

A. $y = 2x + 8$

B. $y = 2x - 4$

C. $y = 2x - 51$

D. $y = 2x - 8$

Answer: D

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93. If the line ax+by+c=0 always passes through the fixed point (1,-2) then : a,b,c are in

A. A.P.

B. H.P.

C. G.P.

D. None of these

Answer: A

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94. If l, m, n are in AP, then the line lx+my+n=0` will always pass through the point

A. $(- 1, 2)$

B. $(1, \ - 2)$

C. $(1, 2)$

D. $(2, 1)$

Answer: B

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95. If a, b, c are in harmonic progression, then the straight line $\left(\left(\frac{x}{a}\right)\right)_{\frac{y}{b}} + \left(\frac{l}{c}\right) = 0$ always passes through a fixed point. Find that point.

A. $(-1, -2)$

B. $(-1, 2)$

C. $(1, -2)$

D. $1, -1/2)$

Answer: C

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96. The incentre of the triangle formed by the straight line having 3 as X-intercept and 4 as Y-intercept, together with the coordinate axes, is

A. $(2, 2)$

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

C. $(1, 2)$

D. $(1, 1)$

Answer: D

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97. The equations of the sides of a triangle are $x - 3y = 0, 4x + 3y = 5, 3x + y = 0$. The line $3x - 4y = 0$ passes through (A) Incentre (B) Centroid (C) Orthocentre (D) Circumcentre

A. The incentre

B. The centroid

C. The circumcentre

D. The orthocentre of the triangle

Answer: D

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

A. isosceles

B. equilateral

C. right-angled

D. none of these

Answer: A

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99. The straight lines $x + y = 0, 5x + y = 4$ and $x + 5y = 4$ form (A) an isosceles triangle (B) an equilateral triangle (C) a scalene triangle (D) a

right angled triangle

A. an isosceles triangle

B. an equilateral triangle

C. a scalene triangle

D. a right angled triangle

Answer: A

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Evaluation Test

1. If $f(\alpha) = x\cos\alpha + y\sin\alpha - p(\alpha),$ then the lines $f(\alpha) = 0$ and $f(\beta) = 0$ ar perpendicular to each other, if

A. $\alpha = \beta$

B. $\alpha + \beta = \frac{\pi}{2}$

C. $|\alpha - \beta| = \frac{\pi}{2}$

D. none of these

Answer: C

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2. The locus of the orthocentre of the triangle formed by the lines $(1+p)x - py + p(1+p) = 0$, $(1+q)x - qy + q(1+q) = 0$ and y = 0, where $p \neq \cdot q$, is (A) a hyperbola (B) a parabola (C) an ellipse (D) a straight line

A. a hyperbola

B. a parabola

C. an ellipse

D. a straight line

Answer: D

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3. If the straight line $ax + by + c = 0$ make a triangle of constant area with coordinate axes, then

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

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

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

D. none of these

Answer: B

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4. Let $0 < \alpha < \frac{\pi}{2}$ be a fixed angle . If $p = (\cos\theta, \sin\theta)$ and $Q(\cos(\alpha - \theta))$, then Q is obtained from P by

A. clockwise rotation around origin through an angle α

B. anti-clockwose rotation aroung origin through an angle α

C. reflection in the line through origin with slope tan α

D. reflection in the line through origin with slope $\tan\frac{\alpha}{2}$

Answer: D

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5. 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

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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6. 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 α (0 < α' < pi`/4) with the positive direction of x-axis. Find the equation of diagonal not passing through the origin ?

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

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

C. $y(\cos\alpha + \sin\alpha 0 + x(\sin\alpha - \cos\alpha) = a$

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

Answer: A

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7. A line L passeds through the points $(1, 1)$ and $(2, 0)$ and another line L' passes through $\left(\frac{1}{2}, 0\right)$ and perpendicular to L. Then the area of the triangle formed by the lines L, L' and Y-axis is

A. $\frac{15}{8}$

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

C. $\frac{25}{8}$

D. $\frac{25}{16}$

Answer: D

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8. The number of integral 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 is 2 (b) 0 (c) 4 (d) 1

A. 2

B. 0

C. 4

D. 1

Answer: A

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9. If the lines $ax + by + p = 0$,$x\cos\alpha + y\sin\alpha - p = 0(p \neq 0)$ and $x\sin\alpha - y\cos\alpha = 0$ are concurrent and the first two lines include an angle $\frac{\pi}{4}$, then $a^2 + b^2$ is equal to

A. 1

B. 2

C. 3

D. 4

Answer: B

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10. A line $4x + y = 1$ passes through the point A(2,-7) and meets line BC at B whose equation is $3x - 4y + 1 = 0$, the equation of line AC such that $AB = AC$ is (a) 52x +89y +519=0(b) 52x +89y-519=0 c) 82x +52y+519=0 (d) 89x +52y -519=0

A. $52x + 89y + 519 = 0$

B. $52x + 89y - 519 = 0$

C. $89x + 52y + 519 = 0$

D. $89x + 52y - 519 = 0$

Answer: A

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