MATHS

BOOKS - S CHAND MATHS (ENGLISH)

STRAIGHT LINES

Examples

1. The equation of the line containing the point $(4, -5)$ and parallel to the line joining the points (3,7) and (-2,4) is

A. $5x + 3y + 27 = 0$

B. $3x - 5y + 27 = 0$

C. $3x - 5y - 37 = 0$

D. $3x - 5y + 37 = 0$

Answer: D

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2. If the perpendicular from the origin to a line meets at the point $(-2, 9)$ then the equation of the line is

A. $2x - 9y + 85$

B. $2x + 9y = 85 = 0$

C. $9x - 2y + 85 = 0$

D. $9x + 2y + 85 = 0$

Answer: A

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3. If the points A(7,3) and C(0,-4) are two opposite vertices of a rhombus ABCD, then the equation of the diagonal BD is

A. $x - y - 3 = 0$

B. $x + y + 3 = 0$

C. $x - y + 3 = 0$

D. $x + y - 4 = 0$

Answer: D

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4. The equation of a straight line passes through the point $(-3, 7)$ and makes intercepts on the axes equal in magnitude but opposite in sign is

A. (a) $x - y - 10 = 0$

B. (b) $x - y + 10 = 0$

C. (c) $x + y + 10 = 0$

D. (d) $x + y - 10 = 0$

Answer: B

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5. If the lines $p(p^2 + 1)x - y + q = 0$ and $(p^2 + 1)^2 x + (p^2 + 1)y + 2q = 0$ are perpendicular to the same line, then the value of p is

A. (a) 1

B. (b) -1

C. (c) 2

D. (d) -2

Answer: B

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6. If the image of the point (2,1) in a line is (4,3) then the equation of line is

(i) $x + y + 5 = 0$

(ii) $x - y + 5 = 0$

(iii) $x + y - 5 = 0$

(iv) $x - y - 5 = 0$

A. $x + y + 5 = 0$

B. $x - y + 5 = 0$

C. $x + y - 5 = 0$

D. $x - y - 5 = 0$

Answer: C

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7. The coordinats of the orthocentre of the triangle whose sides lie along the lines $x = 0, y = 0$ and $x + y - 1 = 0$ is

(i) (0,0)

(ii) $\left(0, -\frac{8}{3}\right)$

(iii) $(-2, 0)$

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

A. (0,0)

B. $\left(0, -\frac{8}{3}\right)$

C. $(-2, 0)$

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

Answer: A

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8. The coordinates of circumcentre of the triangle whose vertices are (0,0), (4,0) and (0,-6) is

A. (0,0)

B. (4,0)

C. $(0, -6)$

D. $(2, -3)$

Answer: D

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9. The length of the perpendicular from the point $(a\cos\alpha, a\sin\alpha)$ upon the straight line $y = x\tan\alpha + c, 0 < \alpha < \frac{\pi}{2}, c > 0$ is

A. c

B. $c\cos\alpha$

C. $c\sin^2\alpha$

D. $c\sec^2\alpha$

Answer: B

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

A. (a) $x + y = ab$

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

C. (c) $ax + by = a^2$

D. (d) $bx + ay = b^2$

Answer: C

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Multiple Choice Questions

1. The point on the y-axis which is equidistant from the points $(3, 2)$ and $(-5, -2)$ is

A. (a) $(-2, 0)$

B. (b) $(0, -2)$

C. (c) $(0, -1)$

D. (d) $(-1, 0)$

Answer: B

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2. A circle of diameter 20 units passes through the point $(-3, -1)$. If the centre of a circle of $(2\alpha - 1, 3\alpha + 1)$, then natural namber α is

A. 3

B. 4

C. 2

D. 1

Answer: C

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3. If point $C(-4, 1)$ divides the line segment joining the point $A(2, -2)$ and B in the ratio $3:5$, then the coordinates of B are

A. (a) $(-14, 6)$

B. (b) $(6, -14)$

C. (c) $(-14, -6)$

D. (d) $(-6, -14)$

Answer: A

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4. If the points $A(-2, -1), B(1, 0), C(a, 3)$ and $D(1, b)$ form a parallelogram ABCD, Then the values of a and b are

A. $a = -4, b = -2$

B. $a = -4, b = 2$

C. $a = 4, b = 2$

D. $a = 2, b = -4$

Answer: C

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5. If the middle points of the sides of a triangle are $(1, 1), (2, -3)$ and $(3, 2)$ then the centroid of the triangle is (i) $(-2, 0)$ (ii) $(0, 2)$ (iii) $(3, 2)$ (iv) $(2, 0)$

A. $(-2, 0)$

B. $(0, 2)$

C. $(3, 2)$

D. $(2, 0)$

Answer: D

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6. The vertices of triangle are A(-5,3),B(p-1) and C(6,q). If the centroid of the ΔABC is $(1, -1)$, then the values of p and q are

(i) $p = -2, q = 5$

(ii) $p = 2, q = -5$

(iii) $p = 3, q = 5$

(iv) $p = -5, q = 2$

A. $p = -2, q = 5$

B. $p = 2, q = -5$

C. $p = 3, q = 5$

D. $p = -5, q = 2$

Answer: B

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7. The tangent of the angle between the lines joining the points $(-1, 2), (3, -5)$ and $(-2, 3), (5, 0)$ is

(i) $\frac{37}{49}$

(ii) $\frac{49}{37}$

(iii) $\frac{23}{47}$

(iv) $\frac{47}{23}$

A. $\frac{37}{49}$

B. $\frac{49}{37}$

C. $\frac{23}{47}$

D. $\frac{47}{23}$

Answer: A

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8. If a line joining the points $(-2, 6)$ and (4,8) is perpendicular to the line joining the points (8,12) and (x,24), then the value of x is

(i) 3

(ii) 4

(iii) -4

(iv) 2

A. 3

B. 4

C. -4

D. 2

Answer: B

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9. If the points (-2,6) and (4,8) is perpendicular to the line joining the points (8,12) and (x,24) then the value of x is

A. (a) $\frac{2}{7}$

B. (b) 4

C. (c) 3

D. (d) -4

Answer: C

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10. If the line through (3,y) and (2,7) is parallel to the line through $(-1, 4)$ and (0,6), then the value of y is (i) -9 (ii) -8 (iii) 8 (iv) 9

A. -9

B. -8

C. 8

D. 9

Answer: D

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11. The equation of line passing through $(2, -3)$ and making an angle of 120° with positive direction of x- axis is (i) $\sqrt{3}x - y + 3 - 2\sqrt{3} = 0$

(ii) $\sqrt{3}x + y - 3 - 2\sqrt{3} = 0$ (iii)

$\sqrt{3}x + y + 3 - 2\sqrt{3} = 0$ (iv)

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

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

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

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

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

Answer: C

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12. The inclination of the line $x - y + 3 = 0$ with the positive direction of x-axis is (i) 45° (ii) 135° (iii) -45° (iv) -135°

A. 45°

B. 135°

C. -45°

D. -135°

Answer: A

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13. The equation of a line whose inclination is $\frac{5\pi}{6}$ and which cuts off an intercept of 4 units on negative direction of y-axis is (i) $x + \sqrt{3}y + 4\sqrt{3} = 0$ (ii) $x - \sqrt{3}y + 4\sqrt{3} = 0$ (iii) $x + \sqrt{3}y - 4\sqrt{3} = 0$ (iv) $x - \sqrt{3}y - 4\sqrt{3} = 0$

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

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

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

D. $x - \sqrt{3}y - 4\sqrt{3} = 0$

Answer: A

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14. The equation of the line through $(-1, 5)$ making an intercept of -2 on y-axis is (i) $x + 7y + 2 = 0$ (ii) $7x + y + 2 = 0$ (iii) $x - 7y + 2 = 0$ (iv) $7x - y + 2 = 0$

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

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

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

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

Answer: B

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15. The equation of the line which cuts of intercept 4 on x-ais and makes an angle of 60° with the positive direction of the x-axis is

(i) $y = \sqrt{3}(x + 4)$

(ii) $y = -\sqrt{3}(x - 4)$

(iii) $y = \sqrt{3}(x - 4)$

(iv) $y = -\sqrt{3}(x + 4)$

A. $y = \sqrt{3}(x + 4)$

B. $y = -\sqrt{3}(x-4)$

C. $y = \sqrt{3}(x-4)$

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

Answer: C

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16. If the straight line $y = mx + c$ passes through the points (2,4) and $(-3, 6)$, then the value of m and c are

(i) $m = -\frac{2}{5}, c = \frac{24}{5}$

(ii) $m = \frac{2}{5}, c = \frac{24}{5}$

(iii) $m = -\frac{2}{5}, c = -\frac{24}{5}$

(iv) $m = \frac{2}{5}, c = -\frac{24}{5}$

A. $m = -\frac{2}{5}, c = \frac{24}{5}$

B. $m = \frac{2}{5}, c = \frac{24}{5}$

C. $m = -\frac{2}{5}, c = -\frac{24}{5}$

D. $m = \frac{2}{5}, c = -\frac{24}{5}$

Answer: A

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17. A line passes through P(1,2) such that the portion of the line intercepted between the axes is bisected at P. The equation of the line is

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

B. $x - y + 1 = 0$

C. $x + y - 3 = 0$

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

Answer: D

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18. The equation of a straight line on which the perpendicular from the origin of the length 2 units and this perpendicular makes an angle of 240° with the x-axis is (i) $x + \sqrt{3}y + 4 = 0$ (ii) $x - \sqrt{3}y + 4 = 0$ (iii) $x - \sqrt{3}y - 4 = 0$ (iv) $x + \sqrt{3}y - 4 = 0$

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

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

C. $x - \sqrt{3}y - 4 = 0$

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

Answer: A

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19. The two lines $ax + by + c = 0$ and $a'x + b'y + c' = 0$ are perpendicular if (i) $ab' = a'b$ (ii) $ab + a'b' = 0$ (iii) $ab' + a'b = 0$ (iv) $aa' + bb' = 0$

A. $ab' = a'b$

B. $ab + a'b' = 0$

C. $ab' + a'b = 0$

D. $aa' + bb' = 0$

Answer: D

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20. The angle between lines $y = \left(2 - \sqrt{3}\right)x + 5$ and $y = \left(2 + \sqrt{3}\right)x + 7$ is

A. 30°

B. 45°

C. 60°

D. 90°

Answer: C

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21. The ratio in which the line segment joining (-1,1) and (5,7) is divided by the line $x + y = 4$ is

A. $1:2$ internally

B. $1:2$ externally

C. $2:1$ internally

D. $2:1$ externally

Answer: A

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22. If the image of the point $(-3, k)$ in the line $2x + y - 2 = 0$ is the point (1,5) then the value of k is (i) 2 (ii) 3 (iii) -3 (iv) 1

A. 2

B. 3

C. -3

D. 1

Answer: B

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23. The coordinates of the orthocentre of the triangle whose sides lie along the lines $x = 0, y = 0$ and $3x - 5y + 7 = 0$ is (i) $\left(0, \frac{7}{5}\right)$ (ii) $\left(-\frac{7}{3}, 0\right)$ (iii) $(0, 0)$ (iv) $\left(-\frac{7}{5}, \frac{7}{5}\right)$

A. $\left(0, \frac{7}{5}\right)$

B. $\left(-\frac{7}{3}, 0\right)$

C. $(0, 0)$

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

Answer: C

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24. The coordinates of the circumcentre of the triangle whose vertices are at $(0, 0), (6, 0)$ and $(0, 8)$ is

A. (a) $(6, 0)$

B. (b) $(0, 8)$

C. (c) $(3, 4)$

D. (d) $(0, 0)$

Answer: C

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25. If the lines $\frac{x}{3}+\frac{y}{4}=5$ and $3x+ky=9$ are perpendicular to each then the value of k is

A. -4

B. -3

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

D. 2

Answer: A

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26. If the lines $2x + y - 3 = 0, 5x + ky - 3 = 0$ and $3x - y - 2 = 0$ are concurrent, then the value of k is

A. -3

B. -2

C. -1

D. 2

Answer: B

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27. The equation of the line passing through (1,2) and perpendicular to $x + y + 7 = 0$ 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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28. If p is the length of perpendicular from the origin on the line $\frac{x}{a} + \frac{y}{b} = 1$ and a^2, p^2, b^2 are in A.P., then

(A) $a^4 + b^4 = 0$

(B) $a^4 - b^4 = 0$

(C) $a^2 + b^2 = 0$

(D) $a^2 - b^2 = 0$

A. $a^4 + b^4 = 0$

B. $a^4 - b^4 = 0$

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

D. $a^2 - b^2 = 0$

Answer: A

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29. The distance of the point $P(1, -3)$ from the line $2y - 3x = 4$ is

(A) 13

(B) $\frac{7}{13}\sqrt{3}$

(C) $\sqrt{13}$

(D) $\frac{7}{13}$

A. 13

B. $\frac{7}{13}\sqrt{3}$

C. $\sqrt{13}$

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

Answer: C

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30. The coordinates of the foot of the perpendicular from the point (2,3) on the line $x + y - 11 = 0$ are (i) (-6,5) (ii) (5,6) (iii) (-5,6) (iv) (6,5)

A. (-6,5)

B. (5,6)

C. (-5,6)

D. (6,5)

Answer: B

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31. If a vertex of a square is at the point $(1, -1)$ and one of its sides lie along the line $3x - 4y - 17 = 0$, then the area of the square is

A. 4 sq. units

B. 3 sq. units

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

D. 2 sq. units

Answer: A

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32. The equations of the lines which pass through the point (3,-2) and are inclined at 60° to the line $\sqrt{3}x + y = 1$ are (i)

$y + 2 = 0, \sqrt{3}x - y - 2 - 3\sqrt{3} = 0$ (ii)

$x-2=0, \sqrt{3}x-y+2+3\sqrt{3}=0$ (iii)

$x-3=0, \sqrt{3}x-y-2-3\sqrt{3}=0$ (iv) none of these

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

D. none of these

Answer: A

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

A. $(1,1)$

B. $(-1,1)$

C. $(1,-1)$

D. $(-1,-1)$

Answer: D

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

$\sqrt{3}x + y - \sqrt{3} = 0, \sqrt{3}x - y\sqrt{3} = 0$ (ii)

$\sqrt{3}x + y + \sqrt{3} = 0, \sqrt{3}x - y + \sqrt{3} = 0$ (iii)

$x + \sqrt{3}y - \sqrt{3} = 0, x - \sqrt{3}y - \sqrt{3} = 0$ (iv)

none of these

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

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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35. The distance between the lines $y = mx + c_1$ and $y = mx + c_2$ is

A. $\frac{c_1 - c_2}{\sqrt{m^2 + 1}}$

B. $\frac{|c_1 - c_2|}{\sqrt{m^2 + 1}}$

C. $\frac{c_2 - c_1}{\sqrt{m^2 + 1}}$

D. 0

Answer: B

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36. Equations of diagonals of the square formed by the lines $x = 0, y = 0, x = 1$ and $y = 1$ are

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

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

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

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

Answer: C

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37. The point (4,1) undergoes the following two successive transformations

(i) Reflection about the line $y = x$

(ii) Translation through a distance of 2 units along the positive x-axis.

The coordinates of the new point are

A. (4,3)

B. (3,4)

C. (1,4)

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

Answer: B

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38. The equation $ax + by + c = 0$ represents a straight line

A. for all real numbers a,b and c

B. only when $a \neq 0$

C. only where $b \neq 0$

D. only when atleast one a and b is non - zero.

Answer: D

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

A. $1:2$

B. $3:7$

C. $2:3$

D. $2:5$

Answer: B

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40. The tngent of angle between the lines whose intercepts on the axes are a, -b and b -a respectively is

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

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

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

D. none of these

Answer: C

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41. The number of straight lines which are equally inclined to both the axes is

A. 4

B. 3

C. 2

D. 1

Answer: A

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42. The circumcentre of the triangle formed by lines $x = 0, y = 0$ and $x + y - 1 = 0$ is

A. (0,0)

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

C. (1,1)

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

Answer: B

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43. The inclination of the line passing through the point (-3,6) and the mid-point of the line joining the points $(4, -5)$ and $(-2, 9)$ is

(i) $\frac{\pi}{2}$

(ii) $\frac{\pi}{6}$

(iii) $\frac{\pi}{3}$

(iv) $\frac{3\pi}{4}$

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

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

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

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

Answer: D

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44. The equations of the line with slope $-\frac{3}{2}$ and which is concurrent with lines $4x + 3y - 7 = 0$ and $8x + 5y - 1 = 0$ is

(i) $3x + 2y - 63 = 0$

(ii) $3x + 2y - 2 = 0$

(iii) $2y - 3x - 2 = 0$

(iv) none of these

A. $3x + 2y - 63 = 0$

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

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

D. none of these

Answer: B

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

(i) $\left(-2, \frac{2}{3} \right)$

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

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

(iv) none of these

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

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

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

D. none of these

Answer: C

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46. Write the value of $\theta \in \left(0, \frac{\pi}{2}\right)$ for which area of the triangle formed by points $O(0, 0),\ A(a\cos\theta,\ b\sin\theta) and\ B(a\cos\theta,\ -b\sin\theta)$ is maximum.

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

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

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

D. none of these

Answer: B

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