





HOW TO TEACH
MATH MCQs

M. MAQSOOD ALI

$4x^2 + 9y^2 = 36$

a  b 

c  d 

BOOK - 2

MAQSOOD ALI

Chapter 2

STRAIGHT LINES**DISTANCE BETWEEN TWO POINTS (x_1, y_1) AND (x_2, y_2) :** (x_1, y_1)  (x_2, y_2)

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

MCQ-1 :What is the distance between the points $(2, -6)$ and $(-4, 2)$?

- (a) 10 (b) $5\sqrt{2}$ (c) $2\sqrt{13}$ (d) $2\sqrt{5}$

Solution: $(2, -6)$ $(-4, 2)$

$$d = \sqrt{(-4 - 2)^2 + (2 + 6)^2}$$

$$d = \sqrt{36 + 64}$$

$$= \sqrt{100}$$

$$= 10$$

The answer is (a).

MCQ-2 :What is the value of x , if the distance between the points $(2, -5)$ and $(8, x)$ is 10 units?

- (a) 8 (b) -9 (c) -4 (d) 6

Solution:

$$(2, -5)$$

$$(8, x)$$

$$d = 10 \text{ units}$$

$$d = \sqrt{(8-2)^2 + (x+5)^2}$$

$$10 = \sqrt{36 + (x+5)^2}$$

$$100 = 36 + (x+5)^2$$

$$100 - 36 = (x+5)^2$$

$$(x+5)^2 = 64$$

$$x+5 = \pm 4$$

$$x = -1, -9$$

The answer is (b).

EXERCISE-1(1) What is the distance between the points (x_1, y_1) and (x_2, y_2) ?

(a) $\sqrt{(x_2 + x_1)^2 - (y_2 + y_1)^2}$

(b) $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

(c) $(x_2 - x_1)^2 + (y_2 - y_1)^2$

(d) $\sqrt{(x_2 - x_1) + (y_2 - y_1)}$

(2) What is the distance between the points (3, 0) and (0, 5)?

(a) 8

(b) 2

(c) $\sqrt{34}$

(d) $\sqrt{10}$

(3) What is the distance of the point (4, 3) from the origin?

(a) 7

(b) 2

(c) 1

(d) 5

(4) What is the distance between origin and the point on x-axis whose abscissa is 5?

(a) 5

(b) 25

(c) $\sqrt{5}$

(d) None

(5) What is the distance between two points lie on x-axis and y-axis whose abscissa and ordinate are 4 and 3 respectively?


(a) $\sqrt{7}$

(b) 5

(c) 1

(d) 7

- (6) The length of three sides of a triangle are 8, $\sqrt{64}$ and $\frac{40}{\sqrt{25}}$ units.
What is the name of the triangle ?
(a) isosceles (b) rightangled (c) equilateral (d) scalene
- (7) The length of three sides of a triangle are 3,4 and 5 units.
What is the name of the triangle ?
(a) isosceles (b) rightangled (c) equilateral (d) scalene
- (8) What is the sum of the distances of a point (5,2) from x –axis and y –axis ?
(a) 9 (b) 3 (c) $\sqrt{29}$ (d) 7
- (9) A point $P(4, x)$ lies in the 4th quadrant, equidistance from both axes.
What are the coordinates of P .
(a) (4,1) (b) (4,4) (c) (4,–4) (d) (4,0)
- (10) $y = ?$, if the distance between the points (2, y) and (10, 3) is 10 units.
(a) 6 (b) –4 (c) 8 (d) 9
- (11) $x = ?$, if the distance between the points (x , 2) and (4, 6) is $2\sqrt{13}$.
(a) –3 (b) 4 (c) –2 (d) 8

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DISTANCE BETWEEN A POINT (x_1, y_1) AND A LINE $ax + by + c = 0$

$$d = \left| \frac{ax_1 + by_1 + c}{\sqrt{a^2 + b^2}} \right|$$

MCQ- 3:

What is the distance between the point $(3, -5)$ and the line $3x - 4y + 6 = 0$?

- (a) $14/5$ (b) $8/5$ (c) 6 (d) 7

Solution:

$$(3, -5)$$

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

$$d = \left| \frac{3(3) - 4(-5) + 6}{\sqrt{3^2 + (-4)^2}} \right|$$

$$d = \left| \frac{9 + 20 + 6}{\sqrt{9 + 16}} \right|$$

$$= 35/5$$

$$= 7 \text{ units}$$

The answer is (d).

EXERCISE-2

- (1) What is the distance of the point $(5, -6)$ from a line $3x - 4y + 1 = 0$?
- (a) 8 (b) 4 (c) 12 (d) 10
- (2) What is the distance between the point $(-2, 3)$ and the line $8x - 6y - 6 = 0$?
- (a) 10 (b) 8 (c) 4 (d) None

INTERNAL DIVISION

Point (x, y) divides the line segment joining the points (x_1, y_1) and (x_2, y_2) in the ratio $m_1 : m_2$.

$$x = \frac{m_1x_2 + m_2x_1}{m_1 + m_2}, \quad y = \frac{m_1y_2 + m_2y_1}{m_1 + m_2}$$

Shortcut:**Numinator**

Abscissa (x)	Ordinate (y)
$x_1 \quad x_2$ $\swarrow \quad \searrow$ $m_1 \quad m_2$	$y_1 \quad y_2$ $\swarrow \quad \searrow$ $m_1 \quad m_2$

MCQ- 4:

What is the point divides the line segment joining the points $(2, 11)$ and $(8, -4)$ in the ratio 1: 2?

- (a) $(5, 6)$ (b) $(4, 6)$ (c) $(4, 7)$ (d) $(5, 7)$

Solution:

$$x = \frac{m_1x_2 + m_2x_1}{m_1 + m_2}, \quad y = \frac{m_1y_2 + m_2y_1}{m_1 + m_2}$$

$2 \quad 8$ $\swarrow \quad \searrow$ $1 \quad 2$	$11 \quad -4$ $\swarrow \quad \searrow$ $1 \quad 2$
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$$\begin{aligned} & \frac{4 + 8, 22 - 4}{3, 3} \\ & = (4, 6) \end{aligned}$$

The answer is (b).

TO FIND RATIO**(i) When abscissa is given:**

$$\frac{m_1}{m_2} = -\frac{x - x_1}{x - x_2}$$

(ii) When ordinate is given:

$$\frac{m_1}{m_2} = -\frac{y - y_1}{y - y_2}$$

MCQ-5 :What is the ratio in which x-axis divides the join of $(-6,4)$ and $(2,-8)$?

(a) 1:2

(b) 2:3

(c) 1:3

(d) 3:2

Solution: \because x-axis divides the join, and on x-axis

$$y = 0$$

$$y_1 = 4, \quad y_2 = -8$$

$$\frac{m_1}{m_2} = -\frac{y - y_1}{y - y_2}$$

$$= -\frac{0 - 4}{0 - (-8)}$$

$$= \frac{4}{8}$$

$$= \frac{1}{2}$$

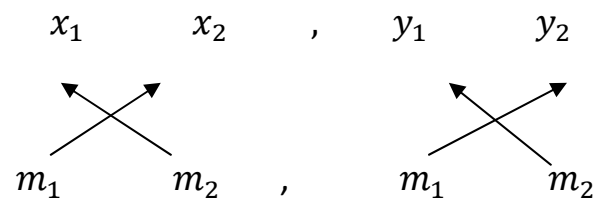
The ratio is 1 : 2.

The answer is (a).

EXTERNAL DIVISION

Point (x, y) divides the line segment joining the points (x_1, y_1) and (x_2, y_2) .

Abscissa (x) **Ordinate (y)**



$$x = \frac{m_1 x_2 - m_2 x_1}{m_1 - m_2}, \quad y = \frac{m_1 y_2 - m_2 y_1}{m_1 - m_2}$$

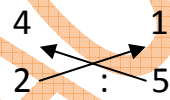
MCQ-6 :

What is the abscissa of the point which divides the join $(4, 3)$ and $(1, 12)$ externally in the ratio $2:5$?

- (a) 8 (b) 6 (c) -2 (d) 7

Solution:

Abscissa



$$x = \frac{2(1) - 5(4)}{2 - 5} \quad \left\{ \because x = \frac{m_1 x_2 - m_2 x_1}{m_1 - m_2} \right.$$

$$= \frac{2 - 20}{-3}$$

$$= 6$$

The answer is (b).

MID POINT

Mid point of the line segment joining the points (x_1, y_1) and (x_2, y_2) .

$$\text{Mid point : } \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2} \right)$$

MCQ- 7:

What is the mid point of the line segment joining the points $(-4, 5)$ and $(10, -13)$?

- (a) $(7, 9)$ (b) $(-7, -9)$ (c) $(3, -4)$ (d) $(-3, 4)$

Solution:

$$\begin{array}{l} (-4, 5) \\ (10, -13) \end{array}$$

$$\text{mid - point: } \left(\frac{-4+10}{2}, \frac{5-13}{2} \right)$$

$$= \left(\frac{6}{2}, \frac{-8}{2} \right)$$

$$= (3, -4)$$

The answer is (c).

MCQ-8 :

$(8, -9)$ is the mid point of a line joining the points $A(6, 12)$ and B . What are the coordinates of B ?

- (a) $(-2, 3/2)$ (b) $(1, 21/2)$ (c) $(7, 3/2)$ (d) $(10, -30)$

Solution:

$$\begin{array}{l} (8, -9) = (x, y) \\ A(6, 12) = (x_1, y_1) \\ B(x_2, y_2) = ? \end{array}$$

Let mid-point : (x, y)

$$x = \frac{x_1 + x_2}{2}, \quad y = \frac{y_1 + y_2}{2}$$

$$2x = x_1 + x_2, \quad 2y = y_1 + y_2$$

$$x_2 = 2x - x_1, \quad y_2 = 2y - y_1$$

$$x_2 = 2(8) - 6, \quad y_2 = 2(-9) - 12$$

$$x_2 = 16 - 6, \quad y_2 = -18 - 12$$


$$x_2 = 10, \quad y_2 = -30$$

The answer is (d).

EXERCISE-3

- (1) A point divides a line joining the points $P(6, 16)$ and $Q(-4, -4)$ in the ratio 2:3. What is the ordinate of the point?
 (a) 10.5 (b) 2 (c) 40 (d) 8
- (2) A point $(a, -5)$ divides the join of $M(3, 5)$ and $N(-3, -8)$ in the ratio 10:3. What is the value of a ?
 (a) $\frac{3}{5}$ (b) -5 (c) $-\frac{21}{13}$ (d) 3
- (3) At what point y-axis divides the join of $P(-3, 1)$ and $Q(5, -7)$ in the ratio 3 : 5?
 (a) $(0, -2)$ (b) $(0, -4)$ (c) $(0, \frac{5}{8})$ (d) $(0, 3)$
- (4) What is the point at which x-axis divides the join $A(1, 5)$ and $B(12, -6)$ in the ratio 5 : 6?
 (a) $(0, 7)$ (b) $(-\frac{15}{11}, 0)$ (c) $(6, 0)$ (d) $(7, 0)$
- (5) $M(4, 7)$ is the mid-point of the line segment joining the points $A(6, 9)$ and B . What are the coordinates of B ?
 (a) $(-3, 5)$ (b) $(2, 6)$ (c) $(2, 5)$ (d) $(3, 5)$

- (6) In what ratio a point $(-1, 9.2)$ divides the line joining the points $(2, 8)$ and $(-8, 12)$?
- (a) 3:7 (b) 2:1 (c) 1:2 (d) 5:8
- (7) In what ratio the point $(4, 12)$ divides the join of $A(-6, -3)$ and $B(-2, 3)$ externally?
- (a) 3:-5 (b) 5:-3 (c) 3:5 (d) 5:3
- (8) In the ratio y-axis divides the line segment joining the points $A(-3, 1)$ and $B(5, -7)$?
- (a) 4:7 (b) 2:3 (c) 1:7 (d) 3:5
- (9) In the ratio x-axis divides the line segment joining the points $P(1, 5)$ and $Q(12, -6)$?
- (a) 1:-12 (b) 5:6 (c) 1:12 (d) 3:4

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CENTROID

$A(x_1, y_1)$, $B(x_2, y_2)$ and $C(x_3, y_3)$ are the vertices of a triangle. The coordinates of centroid are

$$\left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3} \right)$$

MCQ- 9:

$(8, -6)$ is the centroid of a triangle, whose vertices are $A(1, 3)$, $B(12, 6)$ and C . What are the coordinates of C ?

- (a) $(11, -27)$ (b) $(7, 1)$ (c) $\left(\frac{5}{3}, 1\right)$ (d) $\left(-\frac{5}{3}, -5\right)$

Solution:

$$\begin{aligned} (8, -6) &= (x, y) \\ A(1, 3) &= (x_1, y_1) \\ B(12, 6) &= (x_2, y_2) \end{aligned}$$

$$\begin{aligned} x_3 &= 3x - x_1 - x_2, & y_3 &= 3y - y_1 - y_2 \\ x_3 &= 3(8) - 1 - 12, & y_3 &= 3(-6) - 3 - 6 \\ &= 11, & &= -27 \end{aligned}$$

The answer is (a).

EXERCISE-4

- (1) What is the centroid of the triangle whose vertices are $(2, 10)$, $(15, -4)$ and $(-5, 12)$?
- (a) $(2, 5)$ (b) $(-3, 9)$ (c) $(6, 9)$ (d) $(4, 6)$
- (2) $A(2, 6)$ and $B(-1, 5)$ and (x, y) are the vertices of a triangle whose centroid is $(7, 8)$. What is x ?
- (a) 19 (b) 20 (c) 21 (d) 17

SLOPE OF A LINE

(i) Line passes through the points (x_1, y_1) and (x_2, y_2) :

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

(ii) Line makes an angle θ with positive x-axis:

$$m = \tan\theta$$

(iii) Equation of straight line $ax + by + c = 0$:

$$m = -\frac{\text{coefficient of } x}{\text{coefficient of } y}$$

$$m = -\frac{b}{a}$$

MCQ- 10:

What is the slope of a line passes through the points $(3, 15)$ and $(-9, -7)$?

(a) $\frac{7}{12}$

(b) $\frac{11}{6}$

(c) $-\frac{3}{4}$

(d) $\frac{3}{4}$

Solution:

$$(3, 15)$$

$$(-9, -7)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-7 - 15}{-9 - 3}$$

$$= \frac{-22}{-12}$$

$$= \frac{11}{6}$$

The answer is (b).

MCQ-11 :

What is the slope of a line makes an angle 60° with the axis of x ?

- (a) $1/2$ (b) $\sqrt{3}/2$ (c) $1/\sqrt{3}$ (d) $\sqrt{3}$

Solution:

$$\theta = 60^\circ$$

$$m = \tan\theta$$

$$m = \tan 60^\circ = \sqrt{3}$$

The answer is (d).

MCQ- 12:

What is the slope of the line $5x - 10y + 6 = 0$?

- (a) $3/2$ (b) $1/2$ (c) -2 (d) $-1/2$

Solution:

$$5x - 10y + 6 = 0$$

$$m = - \frac{\text{coeff. of } x}{\text{coeff. of } y}$$

$$m = - \frac{5}{-10} = \frac{1}{2}$$

EXERCISE-5

(1) What is the slope of a line passes through the points $(3, -5)$ and $(19, 7)$?


- (a) 11 (b) $-\frac{5}{7}$ (c) $\frac{6}{11}$ (d) $\frac{2}{3}$

(2) What is the slope of a line makes an angle 30° with positive x -axis?

- (a) $\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) 1 (d) 2

(3) The equation of a line is $2x - 8y + 5 = 0$. What is the slope of the line?

- (a) $\frac{1}{4}$ (b) -4 (c) $-\frac{5}{2}$ (d) $\frac{8}{5}$

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- (6) What is the slope of a line? The line passes through the point (2, 5) and the point of intersection of two lines whose combined equation is $2x^2 - xy - 3y^2 = 0$.
- (a) $\frac{5}{2}$ (b) 4 (c) $-\frac{7}{3}$ (d) $\frac{1}{2}$
- (7) The slope of a line passes through the origin and the mid-point of the line segment joining the points (3, 6) and (-5, 8).
- (a) $-\frac{1}{7}$ (b) -4 (c) $-\frac{1}{4}$ (d) -7
- (8) ABCD is a trapezium. The equation of \overline{AB} is $2x + 8y - 6 = 0$. What is the slope of \overline{CD} ?
- (a) 4 (b) $-\frac{1}{4}$ (c) $-\frac{3}{4}$ (d) $\frac{2}{5}$
- (9) y-intercept of a line is 3 and x-intercept 5. What is the slope of the line?
- (a) $\frac{3}{5}$ (b) $-\frac{3}{5}$ (c) $\frac{5}{3}$ (d) $-\frac{5}{3}$
- (10) The angle from the line l to the line $x = 0$ is 30° . What is the slope of line l ?
- (a) $\frac{\sqrt{3}}{2}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\sqrt{3}$ (d) $\frac{1}{2}$
- (11) The angle from the line $x = 0$ to the line l is 60° . What is the slope of line l ?
- (a) $-\frac{1}{\sqrt{3}}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\sqrt{3}$ (d) $-\sqrt{3}$

PARALLEL AND PERPENDICULAR LINES**The Lines Are Parallel:**

Two lines are parallel if the slopes of the lines are equal.

$$m_1 = m_2$$

The Lines Are Perpendicular:

Two lines are perpendicular if the product of the slopes of the lines is equal to -1 .

$$m_1 \cdot m_2 = -1$$

MCQ-13 :

What is the slope of a line parallel to the line joining the points $(2, 8)$ and $(6, -16)$?

- (a) 2 (b) -8 (c) 4 (d) -6

Solution:

$$\begin{array}{l} (2, 8) \\ (6, -16) \end{array}$$

$$\begin{aligned} m_1 &= \frac{-16-8}{6-2} \\ &= -\frac{24}{4} \\ &= -6 \end{aligned}$$

$$\begin{aligned} &\text{The lines are parallel.} \\ &\therefore m_2 = m_1 \\ &m_2 = -6 \end{aligned}$$

The answer is (d).

MCQ-14 :

The lines $5x - 10y + 6 = 0$ and $x - ay + 3 = 0$ are parallel. What is the value of a ?

- (a) -10 (b) 4 (c) 2 (d) 10

Solution:

$$m = -\frac{\text{coeff. of } x}{\text{coeff. of } y}$$

$$m_1 = -\frac{5}{-10} = \frac{1}{2}$$

$$m_2 = -\frac{1}{-a} = \frac{1}{a}$$

The lines are parallel

$$m_1 = m_2$$

$$\frac{1}{2} = \frac{1}{a}$$

$$a = 2$$

The answer is (c).

Second Metho(d)

$$x - ay + 3 = 0 \rightarrow (1)$$

$$5x - 10y + 6 = 0$$

Dividing both sides by 5

$$x - 2y + \frac{6}{5} = 0 \rightarrow (2)$$

The lines are parallel.

If, coeff. of x of line 1 = coeff. of x of line 2then, coeff. of y of line 1 = coeff. of y of line 2

$$-a = -2$$

$$a = 2$$

The answer is (c).

MCQ-15 :What is the slope of a line perpendicular to the line $6x - 9y + 8 = 0$?

(a) $-\frac{2}{3}$

(b) $\frac{3}{2}$

(c) $\frac{2}{3}$

(d) $-\frac{3}{2}$

Solution:

$$6x - 9y + 8 = 0$$

$$m = -\frac{\text{coeff. of } x}{\text{coeff. of } y}$$

$$m_1 = -\frac{6}{-9}$$

$$= \frac{2}{3}$$

∴ the lines are perpendicular.

$$\therefore m_1 \cdot m_2 = -1$$

$$m_2 = -\frac{1}{m_1}$$

$$m_2 = -\frac{3}{2}$$

The answer is (d).

MCQ- 16:

The slope of a line is 8 which is perpendicular to the line joining the points $(2, a)$ and $(-6, 5)$. What is the value of a ?

- (a) 6 (b) 4 (c) -4 (d) 2

Solution:

$$(2, a)$$

$$(-6, 5)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m_1 = \frac{5 - a}{-6 - 2}$$

$$m_1 = -\left(\frac{5 - a}{8}\right)$$

$$m_2 = 8$$

∴ the lines are perpendicular

$$\therefore m_1 \times m_2 = -1$$

$$-\left(\frac{5-a}{8}\right) \cdot 8 = -1$$

$$a = 4$$

The answer is (b).

EXERCISE-6

- (1) What is the slope of a line parallel to the line $3x + 12y - 7 = 0$?
- (a) 4 (b) $\frac{7}{3}$ (c) -4 (d) $-\frac{1}{4}$
- (2) What is the slope of a line perpendicular to the line joining the points (2, 5) and (7, -3)?
- (a) $-\frac{5}{2}$ (b) $\frac{5}{8}$ (c) $\frac{2}{5}$ (d) $-\frac{8}{5}$
- (3) What is the slope of perpendicular bisector of a line segment joining the points (3, 5) and (-5, -17)?
- (a) $\frac{4}{11}$ (b) $-\frac{4}{11}$ (c) $\frac{11}{4}$ (d) $\frac{3}{4}$
- (4) $l_1: x - y = 0$, $l_2: 5x - y + 7 = 0$ and $l_3: y + 3x + 9 = 0$ form a triangle. The largest interior angle of the triangle is from by the line _____.
- (a) l_1 and l_3 (b) l_2 and l_1 (c) l_2 and l_3 (d) None
- (5) The equation of a line parallel to a line $4x + 4y + 7 = 0$ is $2x + by + c = 0$. What is the value of b ?
- (a) -4 (b) 4 (c) 2 (d) 1
- (6) Two lines $2x + py + 3 = 0$ and $2x + 5y + q = 0$ are perpendicular to each other. What is the value of p .
- (a) $-\frac{5}{4}$ (b) $-\frac{4}{5}$ (c) 5 (d) $\frac{5}{4}$

ANGLE BETWEEN THE LINES(i) Angle from line l_1 to line l_2 :

$$\tan \theta = \frac{m_2 - m_1}{1 + m_1 m_2}$$

(ii) Angle θ makes line l_2 with line l_1 :

$$\tan \theta = \frac{m_2 - m_1}{1 + m_1 m_2}$$

(iii) Angle between the lines: (acute angle):

$$\tan \theta = \pm \frac{m_2 - m_1}{1 + m_1 m_2} \quad \text{or} \quad \tan \theta = \left| \frac{m_2 - m_1}{1 + m_1 m_2} \right|$$

MCQ-17 :

What is the measure of angle from a line with slope 3 to the line with slope 5 ?

- (a) $\tan^{-1} \left(\frac{1}{15} \right)$ (b) $\tan^{-1} \left(\frac{2}{9} \right)$ (c) $\tan^{-1} \left(\frac{1}{8} \right)$ (d) $\tan^{-1} \left(\frac{3}{5} \right)$

Solution:

$$m_1 = 3, m_2 = 5$$

$$\tan \theta = \frac{m_2 - m_1}{1 + m_1 m_2}$$

$$= \frac{5 - 3}{1 + 5 \times 3} = \frac{2}{16} = \frac{1}{8}$$

$$\theta = \tan^{-1} \left(\frac{1}{8} \right)$$

The answer is (c).

EXERCISE-7(1) What is the tangent of the angle from line with slope $\frac{1}{3}$ to a line with slope $\frac{5}{3}$?

- (a) $\frac{-6}{7}$ (b) $\frac{2}{5}$ (c) $\frac{6}{7}$ (d) $\frac{-2}{5}$

(2) What is the slope between x-axis and the line with slope 1 ?

- (a) 45° (b) 30° (c) 60° (d) 90°

EQUATIONS OF STRAIGHT LINES

Following formulae are used to find the equation of straight lines.

S. No	Conditions	Diagram	Equation
1	Parallel to x -axis y -intercept = b		$y = b$
2	Parallel to y -axis x -intercept = a		$x = a$
3	Line passes through the points (x_1, y_1) and (x_2, y_2)		$y - y_1 = \frac{y_2 - y_1}{x_2 - x_1}(x - x_1)$
4	Slope = m Point (x_1, y_1) lie on the line		$y - y_1 = m(x - x_1)$
5	Slope = m y -intercept = b		$y = mx + c$
6	x -intercept = a y -intercept = b		$\frac{x}{a} + \frac{y}{b} = 1$
7	p = perpendicular distance from origin α = Angle of the perpendicular from x -axis		$x \cos \alpha + y \sin \alpha = p$

MCQ-18 :

What is the equation of a straight line parallel to x-axis and y-intercept is 6 ?

- (a) $x = 6$ (b) $x = -6$ (c) $y = 6$ (d) $y = -6$

Solution:

Equation of line

$$y = b$$

$$y = 6$$

The answer is (c).

MCQ- 19:

What is the equation of a straight line passing through the points (2 , 5) and (3 , 8)?

- (a) $x - 3y + 2 = 0$ (b) $3x - y - 1 = 0$
 (c) $2x - y + 6 = 0$ (d) $6x - 2y + 7 = 0$

Solution:

(2, 5)

(3, 8)

$$m = \frac{8-5}{3-2}$$

$$m = \frac{3}{1}$$

$$m = 3$$

Equation of straight line

$$y - y_1 = m(x - x_1)$$

$$y - 5 = 3(x - 2)$$

$$y - 5 = 3x - 6$$

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

The answer is (b).

Shortcut:

$$m = 3 = \frac{3}{1} = \frac{\text{coeff. of } x}{(-\text{coeff. of } y)}$$

Two terms of the equation are

$$3x - y$$

The equation can be identified by these two terms.

The answer is (b).

MCQ- 20:

What is the equation of a straight line with slope $\frac{2}{5}$ and passing through the point (1, 3)?

- (a) $7x - 3y + 1 = 0$ (b) $5x - 2y + 6 = 0$
 (c) $3x - 2y + 7 = 0$ (d) $2x - 5y + 13 = 0$

Solution:

$$m = \frac{2}{5} = \frac{\text{coeff. of } x}{-\text{coeff. of } y}$$

First two terms are

$$2x - 5y$$

The answer is (d).

MCQ- 21:

What is the equation of a straight line with slope $\frac{3}{2}$ and passing through the point $(\frac{1}{5}, 2)$?

- (a) $5x + 2y - 3 = 0$ (b) $2x - 3y + 1 = 0$
 (c) $15x - 10y - 17 = 0$ (d) $6x + y + 8 = 0$

Solution:

$$m = \frac{3}{2} = \frac{\text{coefficient of } x}{-\text{coefficient of } y}$$

First two terms are

$$3x - 2y$$

No option.

Check (c) taking 5 common

$$5(3x - 2y - 17/5) = 0$$

The answer is (c).

MCQ-22 :

What is the equation of a straight line with slope $\frac{1}{3}$ and passing through the point (2, 1)?


(a) $x - 3y + 1 = 0$

(b) $3x - y + 7 = 0$

(c) $2x + y - 1 = 0$

(d) $x - 3y + 5 = 0$

Solution:

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MCQ-23 :

What is the equation of a straight line whose x and y intercepts are 3 and 5 respectively?

- (a) $3x + 5y - 12 = 0$ (b) $5x + 3y - 6 = 0$
 (c) $5x + 3y - 15 = 0$ (d) $3x + 5y - 15 = 0$

Solution:

$$a = 3, b = 5$$

Equation of straight line

$$\frac{x}{a} + \frac{y}{b} = 1$$

$$bx + ay - ab = 0$$

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

The answer is (c).

The Lines Are Parallel:**MCQ- 24:**

What is the equation of a straight line whose y-intercept is 6 and parallel to the line $2x - 4y + 3 = 0$?

- (a) $x - 2y + 12 = 0$ (b) $2x - y - 6 = 0$
 (c) $2x + y + 12 = 0$ (d) $x + 6y + 2 = 0$

Solution:

Given equation of straight line is

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

$$m_1 = -\frac{\text{coeff.of } x}{\text{coeff.of } y}$$

$$m_1 = -\frac{2}{-4}$$

$$= \frac{1}{2}$$

∴ the lines are parallel.

$$\therefore m_2 = m_1$$

$$m_2 = \frac{1}{2}$$

$$y - \text{intercept} = b = 6$$

Equation of straight line is

$$y = m_2x + b$$

$$y = \frac{1}{2}x + 6$$

$$2y = x + 12$$

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

The answer is (a).

Shortcut:

First two terms can be found using slopes

$$m_2 = \frac{1}{2} = \frac{\text{coeff. of } x}{-\text{coef. of } y}$$

The first two terms are

$$x - 2y$$

The answer is (a).

MCQ-25 :

What is the equation of the line parallel to the line $5x + 3y + 7 = 0$?

(a) $2x + 4y - 3 = 0$

(b) $10x + 6y - 5 = 0$

(c) $x + y - 2 = 0$

(d) $3x + 5y + 9 = 0$

Solution:

Option (b)

$$10x + 6y - 5 = 0$$

$$2 \left(5x + 3y - \frac{5}{2} \right) = 0$$

$$5x + 3y - \frac{5}{2} = 0$$

Since the lines are parallel, so compare the coefficient of x and y .
The coefficients of x and y of this equation are same as given equation.

The answer is (b).

The Lines Are Perpendicular:

MCQ-26 :

What is the equation of a straight line perpendicular to the line $3x + 6y - 5 = 0$ and x-intercept is 2?

(a) $6x - 3y + 2 = 0$

(b) $2x - y - 4 = 0$

(c) $2x - y + 6 = 0$

(d) $x - 2y + 2 = 0$

Solution:

Given equation of straight line is
 $3x + 6y - 5 = 0$

$$m_1 = -\frac{\text{coeff. of } x}{\text{coeff. of } y}$$

$$m_1 = -\frac{3}{6}$$

$$= -\frac{1}{2}$$

\therefore the lines are perpendicular.

$$\therefore m_1 \times m_2 = -1$$

$$-\frac{1}{2} \times m_2 = -1$$

$$m_2 = 2$$

\therefore x - intercept = 2

\therefore the point is (2,0)

Equation of straight line

$$y - y_1 = m_2(x - x_1)$$

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

$$y = 2x - 4$$

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

The answer is (b).

Shortcut:

First two terms of the equation can be found by the slope

$$m_2 = 2 = \frac{2}{1}$$

i.e. $2x - y$

The answer is (b).

EXERCISE-8

- (1) What is the equation of straight line parallel to x-axis and y- intercept 8?
 (a) $x = 8$ (b) $y = 8$ (c) $x = -8$ (d) $y = -8$
- (2) What is the equation of straight line parallel to y-axis and x- intercept -2 ?
 (a) $x = -2$ (b) $y = -2$ (c) $x = 2$ (d) $y = 2$
- (3) What is the equation of a line passes through the point (0, 6) and does not intersect x-axis at any point.
 (a) $x = -6$ (b) $x = 6$ (c) $y = 6$ (d) $y = -6$
- (4) What is the equation of a line x-intersect -5 and does not intersect y-axis at any point?
 (a) $x + y = 5$ (b) $y = 5x$ (c) $y = -5$ (d) $x + 5 = 0$
- (5) What is the equation of a line parallel to the line $x + 2y - 3 = 0$ and intersects y-axis at any point (0, 9)?
 (a) $x + 2y = 18$ (b) $y = -2x + 9$ (c) $2y = x - 18$ (d) $x = -\frac{1}{2}y + 9$

(6) What is the equation of a line parallel to x-axis and passes through the origin?

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

(7) What is the equation of a line parallel to x-axis and passes through the point $(-3, -8)$?

- (a) $y + 8 = 0$ (b) $x + 3 = 0$ (c) $3x + 8y = 0$ (d) $y = -3$

(8) What is the equation of a line parallel to x-axis and passes through the point $(2, 5)$?

- (a) $y - 5 = 0$ (b) $x - 2 = 0$ (c) $2x + 5y = 0$ (d) $2x - 5y = 0$

(9) What is the equation of x-axis?

- (a) $y = x$ (b) $x = 0$ (c) $x = 1$ (d) $y = 0$

(10) What is the equation of y-axis?

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

(11) A line passes through the point, $(1, 2)$ with slope $\frac{1}{2}$. What is the equation of the line?

- (a) $2x + y - 4 = 0$ (b) $x - 2y + 3 = 0$
(c) $x - 2y - 5 = 0$ (d) $5x - y - 3 = 0$

(12) The gradient of a line is -1 and passes through the origin. What is the equation of the line?

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

(13) The slope of a line is $-\frac{2}{3}$ and x-intercept 5. What is the equation of the line?

- (a) $2x + 3y = 10$ (b) $3y - 2x = -10$
(c) $2x + 3y = 15$ (d) $5x + 3y = 25$

(14) What is the equation of a line parallel to the line $x + y + 1 = 0$ and y-intercept 3.

- (a) $x + y = 3$ (b) $x - y = 3$ (c) $3x - y = 0$ (d) $3y - x = 1$

- (15) What is the equation of a line passes through the point of intersection of lines $x = 0$ and $y = 2x + 3$ and slope is -2 ?
- (a) $3y + 2x = 6$ (b) $y + 2x = 3$ (c) $y - 2x = 3$ (d) $2y + x = 3$
- (16) What is the equation of a line passes through the point of intersection of lines $y = 3x$ and $y = -5x$ and the slope of $\frac{3}{2}$?
- (a) $3x - 5y = 6$ (b) $2x - 3y = 2$ (c) $2x + 3y = 5$ (d) $3x - 2y = 0$
- (17) What is the equation of a line intersects x-axis at $(5, 0)$ and parallel to y-axis?
- (a) $y = 5x$ (b) $y = x + 5$ (c) $y = 5$ (d) $x - 5 = 0$
- (18) What is the equation of a line parallel to x-axis and passes through point of intersection of two lines whose combined equation is $x^2 - 5xy + 6y^2 = 0$?
- (a) $y - 5x = 6$ (b) $y = 6$ (c) $y = 0$ (d) $x - 5 = 0$
- (19) What is the equation of a straight line? The x-intercept 3 and the slope is 2?
- (a) $y = 2x - 3$ (b) $y = 2x + 3$ (c) $3y = 2x - 6$ (d) $y = 2x - 6$
- (20) The points P and Q lie on x and y axis respectively. The abscissa of P is 3 and ordinate of Q is -2 . What is the equation of the line?
- (a) $3x + 2y = 6$ (b) $4x - 3y = 12$ (c) $2x - 3y = 6$ (d) $3x - 2y = 6$
- (21) What is the equation of a line. The mid point of the portion between the axes is $(-3, 2)$?
- (a) $2y + 3x = 12$ (b) $3y - 2x = 12$ (c) $3y - 2x = -12$ (d) $2y - 3x = 12$
- (22) The x and y-intercept of a line are 2 and -8 respectively. Which is the equation of the line?
- (a) $y = x - 10$ (b) $y = 2x - 4$ (c) $y = 4x - 8$ (d) $2y = 3x + 8$
- (23) P divides a line segment joining the points $(1, 3)$ and $(-1, 5)$ in the ratio $1 : 1$. What is the equation of \overline{OP} if O is the origin.
- (a) $y = 0$ (b) $x = 0$ (c) $y - 4 = 0$ (d) $x + y = 1$

(24) What is the equation of a line that passes through the point (1, 1) and the point of intersection of two lines whose combined equation is

$$2x^2 + 4xy + 2y^2 = 0?$$

- (a) $y = -x + 1$ (b) $x = 1$ (c) $y = -x$ (d) $y = x$

(25) A line with slope -1 is the perpendicular bisector of a line segment joining the points P (1, 2) and Q (3, 4). What is its equation?

- (a) $x + y = 5$ (b) $x + 2y = 8$
 (c) $x + y = 2$ (d) $2x - y = -6$

(26) A line segment joining the points A(-2, 2) and B(2, -2). What is the equation of the perpendicular bisector of \overline{AB} ?

- (a) $y = x + 4$ (b) $y = 2x$
 (c) $y = -x$ (d) $y = x$

(27) What is the equation of the perpendicular bisector of \overline{AB} , where A(5, 0) and B(-5, 0)?


- (a) $y = x$ (b) $x = 0$ (c) $y = 0$ (d) $y = x - 5$

(28) P(3, 9) and Q(1, 5) are two points. What is the equation of a line that bisects \overline{PQ} and is parallel to the line $5x - y + 7 = 0$?

- (a) $2y = 5x + 4$ (b) $y = 5x - 3$
 (c) $y = 5x + 4$ (d) $5y = 4x + 27$

(29) A(-3, 1) and B(5, 3) are two points. What is the equation of a line that bisects \overline{AB} and is perpendicular to the line $2x - 4y + 7 = 0$?

- (a) $2x + 5y = 12$ (b) $2x + y = 5$
 (c) $x + 2y = 5$ (d) $2x + y = 4$

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