Finding the Equation of a Line Given the Slope and a Point or Two Points

Jonathan R. Bacolod

Sauyo High School

How to Find the Equation of a Line?

Use the formulae:

1. Slope-intercept form: $y = mx + b$

How to Find the Equation of a Line?

Use the formulae:

1. Slope-intercept form: $y = mx + b$
2. Point-slope form: $y - y_1 = m(x - x_1)$

How to Find the Equation of a Line?

Use the formulae:

1. Slope-intercept form: $y = mx + b$
2. Point-slope form: $y - y_1 = m(x - x_1)$
3. Two-point form: $\dfrac{y - y_1}{y_2 - y_1} = \dfrac{x - x_1}{x_2 - x_1}$

How to Find the Equation of a Line Given the Slope and a Point?

Use the point-slope form: $y - y_1 = m(x - x_1)$

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Given: $m = 2$,

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Given: $m = 2$, $(x_1, y_1) = (1, 3)$

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Given: $m = 2$, $(x_1, y_1) = (1, 3)$

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

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Given: $m = 2$, $(x_1, y_1) = (1, 3)$

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

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

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Given: $m = 2$, $(x_1, y_1) = (1, 3)$

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

$y - 3 = 2(x - 1)$ Substitution

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Given: $m = 2$, $(x_1, y_1) = (1, 3)$

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

$$y - 3 = 2(x - 1) \qquad \text{Substitution}$$

$$y - 3 = 2x - 2$$

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Given: $m = 2$, $(x_1, y_1) = (1, 3)$

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

$y - 3 = 2(x - 1)$ Substitution

$y - 3 = 2x - 2$ Distributive Property

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Given: $m = 2$, $(x_1, y_1) = (1, 3)$

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

$y - 3 = 2(x - 1)$ Substitution

$y - 3 = 2x - 2$ Distributive Property

$y = 2x - 2 + 3$

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Given: $m = 2$, $(x_1, y_1) = (1, 3)$

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

$y - 3 = 2(x - 1)$ Substitution

$y - 3 = 2x - 2$ Distributive Property

$y = 2x - 2 + 3$ Addition Property

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Given: $m = 2$, $(x_1, y_1) = (1, 3)$

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

$y - 3 = 2(x - 1)$ Substitution

$y - 3 = 2x - 2$ Distributive Property

$y = 2x - 2 + 3$ Addition Property

$y = 2x + 1$

Example 1

Find the equation of the line with a slope equal to 2 and passes through point $(1, 3)$.

Given: $m = 2$, $(x_1, y_1) = (1, 3)$

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

$$y - 3 = 2(x - 1) \qquad \text{Substitution}$$

$$y - 3 = 2x - 2 \qquad \text{Distributive Property}$$

$$y = 2x - 2 + 3 \qquad \text{Addition Property}$$

$$y = 2x + 1 \qquad \text{Simplification}$$

$\therefore$ the equation of the line is $y = 2x + 1$.

Example 2

Find the equation of the line with a slope equal to $\frac{2}{3}$ and contains the point $(9, 7)$.

Example 2

Find the equation of the line with a slope equal to $\frac{2}{3}$ and contains the point $(9, 7)$.

Given: $m = \frac{2}{3}$,

Example 2

Find the equation of the line with a slope equal to $\frac{2}{3}$ and contains the point $(9, 7)$.

Given: $m = \frac{2}{3}$, $\qquad (x_1, y_1) = (9, 7)$

Example 2

Find the equation of the line with a slope equal to $\frac{2}{3}$ and contains the point $(9, 7)$.

Given: $m = \frac{2}{3}$, $\qquad (x_1, y_1) = (9, 7)$

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

Example 2

Find the equation of the line with a slope equal to $\frac{2}{3}$ and contains the point $(9, 7)$.

Given: $m = \frac{2}{3}$, $\qquad (x_1, y_1) = (9, 7)$

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

$$y - 7 = \frac{2}{3}(x - 9)$$

Example 2

Find the equation of the line with a slope equal to $\frac{2}{3}$ and contains the point $(9, 7)$.

Given: $m = \frac{2}{3}$, $\qquad (x_1, y_1) = (9, 7)$

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

$$y - 7 = \frac{2}{3}(x - 9) \qquad \text{Substitution}$$

Example 2

Find the equation of the line with a slope equal to $\frac{2}{3}$ and contains the point $(9, 7)$.

Given: $m = \frac{2}{3}$, $\qquad (x_1, y_1) = (9, 7)$

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

$$y - 7 = \frac{2}{3}(x - 9) \qquad \text{Substitution}$$

$$y - 7 = \frac{2}{3}x - 6$$

Example 2

Find the equation of the line with a slope equal to $\frac{2}{3}$ and contains the point $(9, 7)$.

Given: $m = \frac{2}{3}$, $(x_1, y_1) = (9, 7)$

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

$y - 7 = \frac{2}{3}(x - 9)$ Substitution

$y - 7 = \frac{2}{3}x - 6$ Distributive Property

Example 2

Find the equation of the line with a slope equal to $\frac{2}{3}$ and contains the point $(9, 7)$.

Given: $m = \frac{2}{3}$, $(x_1, y_1) = (9, 7)$

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

$y - 7 = \frac{2}{3}(x - 9)$ Substitution

$y - 7 = \frac{2}{3}x - 6$ Distributive Property

$y = \frac{2}{3}x - 6 + 7$

Example 2

Find the equation of the line with a slope equal to $\frac{2}{3}$ and contains the point $(9, 7)$.

Given: $m = \frac{2}{3}$, $(x_1, y_1) = (9, 7)$

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

$y - 7 = \frac{2}{3}(x - 9)$ Substitution

$y - 7 = \frac{2}{3}x - 6$ Distributive Property

$y = \frac{2}{3}x - 6 + 7$ Addition Property

Example 2

Find the equation of the line with a slope equal to $\frac{2}{3}$ and contains the point $(9, 7)$.

Given: $m = \frac{2}{3}$, $(x_1, y_1) = (9, 7)$

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

$y - 7 = \frac{2}{3}(x - 9)$ Substitution

$y - 7 = \frac{2}{3}x - 6$ Distributive Property

$y = \frac{2}{3}x - 6 + 7$ Addition Property

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

$\therefore$ the equation of the line is $y = \frac{2}{3}x + 1$.

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Given: $m = 3$,

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Given: $m = 3$, $(x_1, y_1) = (1, -1)$

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Given: $m = 3$, $(x_1, y_1) = (1, -1)$

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

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Given: $m = 3$, $(x_1, y_1) = (1, -1)$

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

$$y - (-1) = 3(x - 1)$$

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Given: $m = 3$, $(x_1, y_1) = (1, -1)$

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

$y - (-1) = 3(x - 1)$ Substitution

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Given: $m = 3$, $(x_1, y_1) = (1, -1)$

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

$$y - (-1) = 3(x - 1) \quad \text{Substitution}$$

$$y + 1 = 3x - 3$$

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Given: $m = 3$, $(x_1, y_1) = (1, -1)$

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

$y - (-1) = 3(x - 1)$ Substitution

$y + 1 = 3x - 3$ Distributive Property

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Given: $m = 3$, $(x_1, y_1) = (1, -1)$

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

$y - (-1) = 3(x - 1)$ Substitution

$y + 1 = 3x - 3$ Distributive Property

$y = 3x - 3 - 1$

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Given: $m = 3$, $(x_1, y_1) = (1, -1)$

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

$y - (-1) = 3(x - 1)$ Substitution

$y + 1 = 3x - 3$ Distributive Property

$y = 3x - 3 - 1$ Subtraction Property

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Given: $m = 3$, $(x_1, y_1) = (1, -1)$

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

$y - (-1) = 3(x - 1)$ Substitution

$y + 1 = 3x - 3$ Distributive Property

$y = 3x - 3 - 1$ Subtraction Property

$y = 3x - 4$

Example 3

Find the equation of the line parallel to $y = 3x - 2$ and passes through point $(1, -1)$.

Given: $m = 3$, $(x_1, y_1) = (1, -1)$

$y - y_1 = m(x - x_1)$	
$y - (-1) = 3(x - 1)$	Substitution
$y + 1 = 3x - 3$	Distributive Property
$y = 3x - 3 - 1$	Subtraction Property
$y = 3x - 4$	Simplification

$\therefore$ the equation of the line is $y = 3x - 4$.

How to Find the Equation of a Line Given Two Points?

Use the two-point form: $\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1)$,

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$

Substitution

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$

Substitution

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

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1} \qquad \text{Substitution}$$

$$\frac{y - 1}{-2} = \frac{x - 1}{2} \qquad \text{Simplification}$$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

Find the LCM:

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

Find the LCM:

$-2 \quad =$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

Find the LCM:
$-2 \quad = \quad (2)$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

Find the LCM:

$-2 = (2)(-1)$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

Find the LCM:

$-2 = (2)(-1)$

$2 =$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

Find the LCM:

$-2 = (2)(-1)$

$2 = (2)$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

Find the LCM:

$-2 = (2)(-1)$

$2 = (2)$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

Find the LCM:

$-2 = (2)(-1)$

$2 = (2)$

LCM $=$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

Find the LCM:

$$\begin{array}{rcll} -2 & = & (2) & (-1) \\ 2 & = & (2) & \\ \hline \text{LCM} & = & (2) & \end{array}$$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

Find the LCM:

$$\begin{array}{rcll} -2 & = & (2) & (-1) \\ 2 & = & (2) & \\ \hline \text{LCM} & = & (2) & (-1) \quad = \end{array}$$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1), \quad (x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

Find the LCM:

$$\begin{array}{rcl} -2 & = & (2)\ (-1) \\ 2 & = & (2) \\ \hline \text{LCM} & = & (2)\ (-1) = -2 \end{array}$$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1)$, $(x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1}$$ Substitution

$$\frac{y - 1}{-2} = \frac{x - 1}{2}$$ Simplification

$$-2\left[\frac{y - 1}{-2}\right] = -2\left[\frac{x - 1}{2}\right]$$

Example 1

Write the equation of the line containing $(1, 1)$ and $(3, -1)$.

Given: $(x_1, y_1) = (1, 1)$, $(x_2, y_2) = (3, -1)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 1}{-1 - 1} = \frac{x - 1}{3 - 1} \quad \text{Substitution}$$

$$\frac{y - 1}{-2} = \frac{x - 1}{2} \quad \text{Simplification}$$

$$-2\left[\frac{y - 1}{-2}\right] = -2\left[\frac{x - 1}{2}\right] \quad \text{Multiplication}$$

Example 1

$$-2\left[\frac{y-1}{-2}\right] = -2\left[\frac{x-1}{2}\right] \quad \text{Multiplication}$$

Example 1

$$-2\left[\frac{y-1}{-2}\right] = -2\left[\frac{x-1}{2}\right] \quad \text{Multiplication}$$

$$y - 1 = -x + 1$$

Example 1

$$-2\left[\frac{y-1}{-2}\right] = -2\left[\frac{x-1}{2}\right] \quad \text{Multiplication}$$

$$y - 1 = -x + 1 \quad \text{Distributive Property}$$

Example 1

$$-2\left[\frac{y-1}{-2}\right] = -2\left[\frac{x-1}{2}\right] \quad \text{Multiplication}$$

$$y - 1 = -x + 1 \quad \text{Distributive Property}$$

$$y = -x + 1 + 1$$

Example 1

$$-2\left[\frac{y-1}{-2}\right] = -2\left[\frac{x-1}{2}\right] \quad \text{Multiplication}$$

$$y - 1 = -x + 1 \quad \text{Distributive Property}$$

$$y = -x + 1 + 1 \quad \text{Addition Property}$$

Example 1

$$-2\left[\frac{y-1}{-2}\right] = -2\left[\frac{x-1}{2}\right] \quad \text{Multiplication}$$

$$y - 1 = -x + 1 \quad \text{Distributive Property}$$

$$y = -x + 1 + 1 \quad \text{Addition Property}$$

$$y = -x + 2$$

Example 1

$$-2\left[\frac{y-1}{-2}\right] = -2\left[\frac{x-1}{2}\right] \quad \text{Multiplication}$$

$$y - 1 = -x + 1 \quad \text{Distributive Property}$$

$$y = -x + 1 + 1 \quad \text{Addition Property}$$

$$y = -x + 2 \quad \text{Simplification}$$

$\therefore$ the equation of the line is $y = -x + 2$.

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4)$,

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$

Substitution

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$

Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Find the LCM:

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Find the LCM:

$-1 \quad =$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Find the LCM:

$-1 \quad = \quad (-1)$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Find the LCM:

$-1 \quad = \quad (-1)$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Find the LCM:

$-1 = (-1)$

$-4 =$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Find the LCM:

$-1 = (-1)$

$-4 = (-1)$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Find the LCM:

$-1 = (-1)$

$-4 = (-1)\ (2^2)$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Find the LCM:

$-1 = (-1)$

$-4 = (-1)\ (2^2)$

LCM $=$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Find the LCM:

$$\begin{array}{rcl} -1 & = & (-1) \\ -4 & = & (-1)\quad (2^2) \\ \hline \text{LCM} & = & (-1) \end{array}$$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Find the LCM:

$$\begin{array}{rcl} -1 & = & (-1) \\ -4 & = & (-1)\ (2^2) \\ \hline \text{LCM} & = & (-1)\ (2^2) = \end{array}$$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4), \quad (x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

Find the LCM:

$$\begin{array}{rcl} -1 & = & (-1) \\ -4 & = & (-1)\ (2^2) \\ \hline \text{LCM} & = & (-1)\ (2^2) = -4 \end{array}$$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4)$, $(x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

$$-4\left[\frac{y - 4}{-4}\right] = -4\left[\frac{x - 2}{-1}\right]$$

Example 2

Write the equation of the line that passes through $(2, 4)$ and whose x-intercept is 1.

Given: $(x_1, y_1) = (2, 4)$, $(x_2, y_2) = (1, 0)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - 4}{0 - 4} = \frac{x - 2}{1 - 2}$$ Substitution

$$\frac{y - 4}{-4} = \frac{x - 2}{-1}$$ Simplification

$$-4\left[\frac{y - 4}{-4}\right] = -4\left[\frac{x - 2}{-1}\right]$$ Multiplication

Example 2

$$-4\left[\frac{y-4}{-4}\right] = -4\left[\frac{x-2}{-1}\right] \quad \text{Multiplication}$$

Example 2

$$-4\left[\frac{y-4}{-4}\right] = -4\left[\frac{x-2}{-1}\right] \quad \text{Multiplication}$$

$$y - 4 = 4x - 8$$

Example 2

$$-4\left[\frac{y-4}{-4}\right] = -4\left[\frac{x-2}{-1}\right] \quad \text{Multiplication}$$

$$y - 4 = 4x - 8 \quad \text{Distributive Property}$$

Example 2

$$-4\left[\frac{y-4}{-4}\right] = -4\left[\frac{x-2}{-1}\right] \quad \text{Multiplication}$$

$$y - 4 = 4x - 8 \quad \text{Distributive Property}$$

$$y = 4x - 8 + 4$$

Example 2

$$-4\left[\frac{y-4}{-4}\right] = -4\left[\frac{x-2}{-1}\right] \quad \text{Multiplication}$$

$$y - 4 = 4x - 8 \quad \text{Distributive Property}$$

$$y = 4x - 8 + 4 \quad \text{Addition Property}$$

Example 2

$$-4\left[\frac{y-4}{-4}\right] = -4\left[\frac{x-2}{-1}\right] \quad \text{Multiplication}$$

$$y - 4 = 4x - 8 \quad \text{Distributive Property}$$

$$y = 4x - 8 + 4 \quad \text{Addition Property}$$

$$y = 4x - 4 \quad \text{Simplification}$$

$\therefore$ the equation of the line is $y = 4x - 4$.

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1)$,

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1), \quad (x_2, y_2) = (1, -3)$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1), \quad (x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1), \quad (x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1)$, $(x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$

Substitution

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1)$, $(x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$

Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1)$, $(x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1)$, $(x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Find the LCM:

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1)$, $(x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Find the LCM:

$-2 \quad =$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1)$, $(x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Find the LCM:

$-2 \quad = \quad (2)$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1)$, $(x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Find the LCM:

$-2 = (2)(-1)$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1)$, $(x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Find the LCM:

$-2 = (2)\quad(-1)$

$8 =$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1)$, $(x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Find the LCM:

$-2 = (2)(-1)$

$8 = (2^3)$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1), \quad (x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Find the LCM:

$-2 = (2)(-1)$

$8 = (2^3)$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1)$, $(x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Find the LCM:

$-2 = (2)(-1)$

$8 = (2^3)$

LCM =

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1), \quad (x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Find the LCM:

$$\begin{array}{rcl} -2 & = & (2)\quad(-1) \\ 8 & = & (2^3) \\ \hline \text{LCM} & = & (2^3) \end{array}$$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1), \quad (x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Find the LCM:

$$\begin{array}{rcl} -2 & = & (2)\quad(-1) \\ 8 & = & (2^3) \\ \hline \text{LCM} & = & (2^3)\quad(-1)\quad = \end{array}$$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1), \quad (x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

Find the LCM:

$$\begin{array}{rcl} -2 & = & (2)\quad(-1) \\ 8 & = & (2^3) \\ \hline \text{LCM} & = & (2^3)\quad(-1) \quad = \quad -8 \end{array}$$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1), \quad (x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

$$-8\left[\frac{y + 1}{-2}\right] = -8\left[\frac{x + 7}{8}\right]$$

Example 3

Write the equation of the line passing through the points $(-7, -1)$ and $(1, -3)$.

Given: $(x_1, y_1) = (-7, -1), \quad (x_2, y_2) = (1, -3)$

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - (-1)}{-3 - (-1)} = \frac{x - (-7)}{1 - (-7)}$$ Substitution

$$\frac{y + 1}{-2} = \frac{x + 7}{8}$$ Simplification

$$-8\left[\frac{y + 1}{-2}\right] = -8\left[\frac{x + 7}{8}\right]$$ Multiplication

Example 3

$$-8\left[\frac{y+1}{-2}\right] = -8\left[\frac{x+7}{8}\right] \quad \text{Multiplication}$$

Example 3

$$-8\left[\frac{y+1}{-2}\right] = -8\left[\frac{x+7}{8}\right] \quad \text{Multiplication}$$

$$4y + 4 = -x - 7$$

Example 3

$$-8\left[\frac{y+1}{-2}\right] = -8\left[\frac{x+7}{8}\right] \quad \text{Multiplication}$$

$$4y + 4 = -x - 7 \quad \text{Distributive Property}$$

Example 3

$$-8\left[\frac{y+1}{-2}\right] = -8\left[\frac{x+7}{8}\right] \quad \text{Multiplication}$$

$$4y + 4 = -x - 7 \quad \text{Distributive Property}$$

$$4y = -x - 7 - 4$$

Example 3

$$-8\left[\frac{y+1}{-2}\right] = -8\left[\frac{x+7}{8}\right] \quad \text{Multiplication}$$

$$4y + 4 = -x - 7 \quad \text{Distributive Property}$$

$$4y = -x - 7 - 4 \quad \text{Subtraction Property}$$

Example 3

$$-8\left[\frac{y+1}{-2}\right] = -8\left[\frac{x+7}{8}\right] \quad \text{Multiplication}$$

$$4y + 4 = -x - 7 \quad \text{Distributive Property}$$

$$4y = -x - 7 - 4 \quad \text{Subtraction Property}$$

$$4y = -x - 11$$

Example 3

$$-8\left[\frac{y+1}{-2}\right] = -8\left[\frac{x+7}{8}\right] \quad \text{Multiplication}$$

$$4y + 4 = -x - 7 \quad \text{Distributive Property}$$

$$4y = -x - 7 - 4 \quad \text{Subtraction Property}$$

$$4y = -x - 11 \quad \text{Simplification}$$

Example 3

$$-8\left[\frac{y+1}{-2}\right] = -8\left[\frac{x+7}{8}\right] \quad \text{Multiplication}$$

$$4y + 4 = -x - 7 \quad \text{Distributive Property}$$

$$4y = -x - 7 - 4 \quad \text{Subtraction Property}$$

$$4y = -x - 11 \quad \text{Simplification}$$

$$\frac{4y}{4} = \frac{-x}{4} - \frac{11}{4}$$

Example 3

$$-8\left[\frac{y+1}{-2}\right] = -8\left[\frac{x+7}{8}\right] \quad \text{Multiplication}$$

$$4y + 4 = -x - 7 \quad \text{Distributive Property}$$

$$4y = -x - 7 - 4 \quad \text{Subtraction Property}$$

$$4y = -x - 11 \quad \text{Simplification}$$

$$\frac{4y}{4} = \frac{-x}{4} - \frac{11}{4} \quad \text{Division Property}$$

Example 3

$$-8\left[\frac{y+1}{-2}\right] = -8\left[\frac{x+7}{8}\right] \quad \text{Multiplication}$$

$$4y + 4 = -x - 7 \quad \text{Distributive Property}$$

$$4y = -x - 7 - 4 \quad \text{Subtraction Property}$$

$$4y = -x - 11 \quad \text{Simplification}$$

$$\frac{4y}{4} = \frac{-x}{4} - \frac{11}{4} \quad \text{Division Property}$$

$$y = -\frac{1}{4}x - \frac{11}{4} \quad \text{Simplification}$$

$\therefore$ the equation of the line is $y = -\frac{1}{4}x - \frac{11}{4}$.

How to Find the Equation of a Line?

Use the formulae:

1. Slope-intercept form: $y = mx + b$

How to Find the Equation of a Line?

Use the formulae:

1. Slope-intercept form: $y = mx + b$
2. Point-slope form: $y - y_1 = m(x - x_1)$

How to Find the Equation of a Line?

Use the formulae:

1. Slope-intercept form: $y = mx + b$
2. Point-slope form: $y - y_1 = m(x - x_1)$
3. Two-point form: $\dfrac{y - y_1}{y_2 - y_1} = \dfrac{x - x_1}{x_2 - x_1}$

How to Find the Equation of a Line Given the Slope and a Point?

Use the point-slope form: $y - y_1 = m(x - x_1)$

How to Find the Equation of a Line Given Two Points?

Use the two-point form: $\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$

Thank you for watching.