

$$y = 3x - 1$$

Therefore, the equation of the line passing through the points (1, 2) and (3, 8) is $y = 3x - 1$.

Example 6:

Find the equation of the line passing through the points (2, 4) and (5, 10).

Identify the values of (x_1, y_1) and (x_2, y_2) in **(2, 4) and (5, 10)**.

$$x_1 = 2 \quad y_1 = 4 \quad x_2 = 5 \quad y_2 = 10$$

Step 1: Use $m = \frac{y_2 - y_1}{x_2 - x_1}$ to solve for slope

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 4}{5 - 2} = \frac{6}{3} = 2$$

Substitute the values in the formula and simplify

$$\text{Slope or } m = 2$$

Step 2:

Use the slope intercept form to find the y-intercept.

$$\text{Use } y = mx + b$$

Choose one point **(x, y) → (2, 4)** where $x = 2$ and $y = 4$ with $m = 2$

$$y = mx + b$$

$$4 = 2(2) + b$$

Substitute the values then simplify

$$4 = 4 + b$$

$$4 - 4 = 4 - 4 + b$$

Subtract both sides by 4 to solve for b

$$0 = b \text{ or } b = 0$$

(5, 10) where $x = 5$ and $y = 10$ with $m = 2$

$$y = mx + b$$

$$10 = 5(2) + b$$

Multiply to simplify

$$10 = 10 + b$$

$$10 - 10 = 10 - 10 + b$$

Subtract both sides by 10 to solve for b

$$0 = b \text{ or } b = 0$$

Step 3: Substitute the value of slope (m) and y-intercept (b) in $y = mx + b$

$$m = 2 \text{ and } b = 0$$

Substitute m and b in $y = mx + b$

$$y = 2x + 0$$

$$y = 2x$$

Therefore, the equation of the line passing through the points (2, 4) and (5, 10) is $y = 2x$.