







## EXAMPLES:

### Question:

Consider the line  $2x - 3y + 5 = 0$ .

Write the equation in the form  $y = mx + b$ .

What is the slope of the line?

What is the  $y$ -intercept?

If you start at any point on the line, how could you move to get to another point?

### Solution:

To put the equation in  $y = mx + b$  form, solve for  $y$ :

$$2x - 3y + 5 = 0 \quad (\text{original equation})$$

$$-3y + 5 = -2x \quad (\text{subtract } 2x \text{ from both sides})$$

$$-3y = -2x - 5 \quad (\text{subtract } 5 \text{ from both sides})$$

$$y = \frac{-2x - 5}{-3} \quad (\text{divide both sides by } -3)$$

$$y = \frac{2}{3}x + \frac{5}{3} \quad (\text{write in the most conventional way})$$

$$\text{slope: } m = \frac{2}{3} = \frac{\text{rise}}{\text{run}}$$

$$y\text{-intercept: } b = \frac{5}{3}$$

To get to a new point, you could move **up 2 and to the right 3**.

(There are, of course, other correct answers.)

**Question:**

Consider the line  $2x - 3y + 5 = 0$ .

What is the  $x$ -intercept? (Give the coordinates.)

What is the  $y$ -intercept? (Give the coordinates.)

**Solution:**

To find the  $x$ -intercept, set  $y = 0$  and solve for  $x$ :

$$2x - 3y + 5 = 0 \quad (\text{original equation})$$

$$2x - 3(0) + 5 = 0 \quad (\text{set } y = 0)$$

$$2x = -5 \quad (\text{subtract 5 from both sides})$$

$$x = -\frac{5}{2} \quad (\text{divide both sides by 2})$$

The  $x$ -intercept is  $(-\frac{5}{2}, 0)$ .

To find the  $y$ -intercept, set  $x = 0$  and solve for  $y$ :

$$2x - 3y + 5 = 0 \quad (\text{original equation})$$

$$2(0) - 3y + 5 = 0 \quad (\text{set } x = 0)$$

$$-3y = -5 \quad (\text{subtract 5 from both sides})$$

$$y = \frac{5}{3} \quad (\text{divide both sides by } -3)$$

The  $y$ -intercept is  $(0, \frac{5}{3})$ .