

Slope-Intercept Form Guided Notes

Slope-Intercept Form

The slope-intercept form of a linear equation (or a line) is:

$$y = mx + b$$

Where:

m = Slope of the line

b = y-intercept (y-coordinate of the point where the line crosses the y-axis)

Problem 1: What are the slope and y-intercept of the graph of $y = -4x - 5$?

Compare the equation with:

$$y = mx + b$$



$$m = -4$$

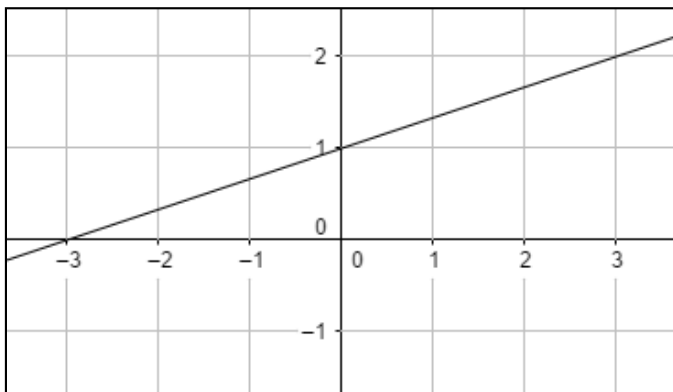


$$b = -5$$

So,

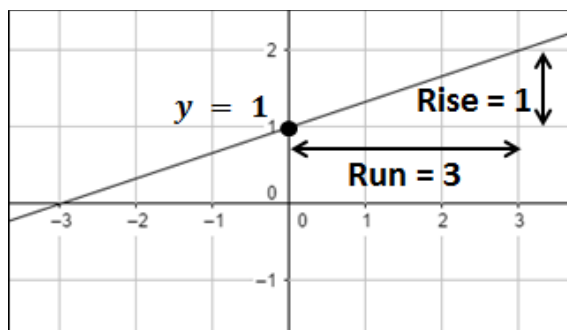
Slope = -4 ; y-intercept = -5

Problem 2: Write an equation in slope-intercept form for the line given below.



Slope-Intercept Form Guided Notes

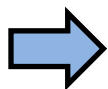
Solution:



$$\text{Slope } m = \frac{\text{rise}}{\text{run}} = \frac{1}{3}$$

The y - *intercept* $b = 1$

$$y = mx + b$$



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

Slope-Intercept Form Given Two Points

If we are given two points on a line, we can write its slope-intercept form by doing the following steps:

- Find slope using the slope formula:

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

- Find the y -intercept by putting any of the two points in the formula $y = mx + b$ and solve for b .
- Write the final equation using m and b found in above steps.

Problem 3: Write an equation in slope-intercept form for the line passing through the points $(1, -3)$ and $(3, 1)$.

First find the slope m :

$$\text{Slope } m = \frac{1 - (-3)}{3 - 1} = 2$$

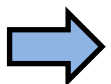
Now find the y -intercept. Put $(3, 1)$ in $y = mx + b$ and solve for b .

$$1 = 2(3) + b$$

$$b = -5$$

Now write the equation using the values m and b .

$$y = mx + b$$



$$y = 2x - 5$$