# Slope of a Line

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# What is Slope?

Slope is the steepness of a line

# How to Find the Slope?

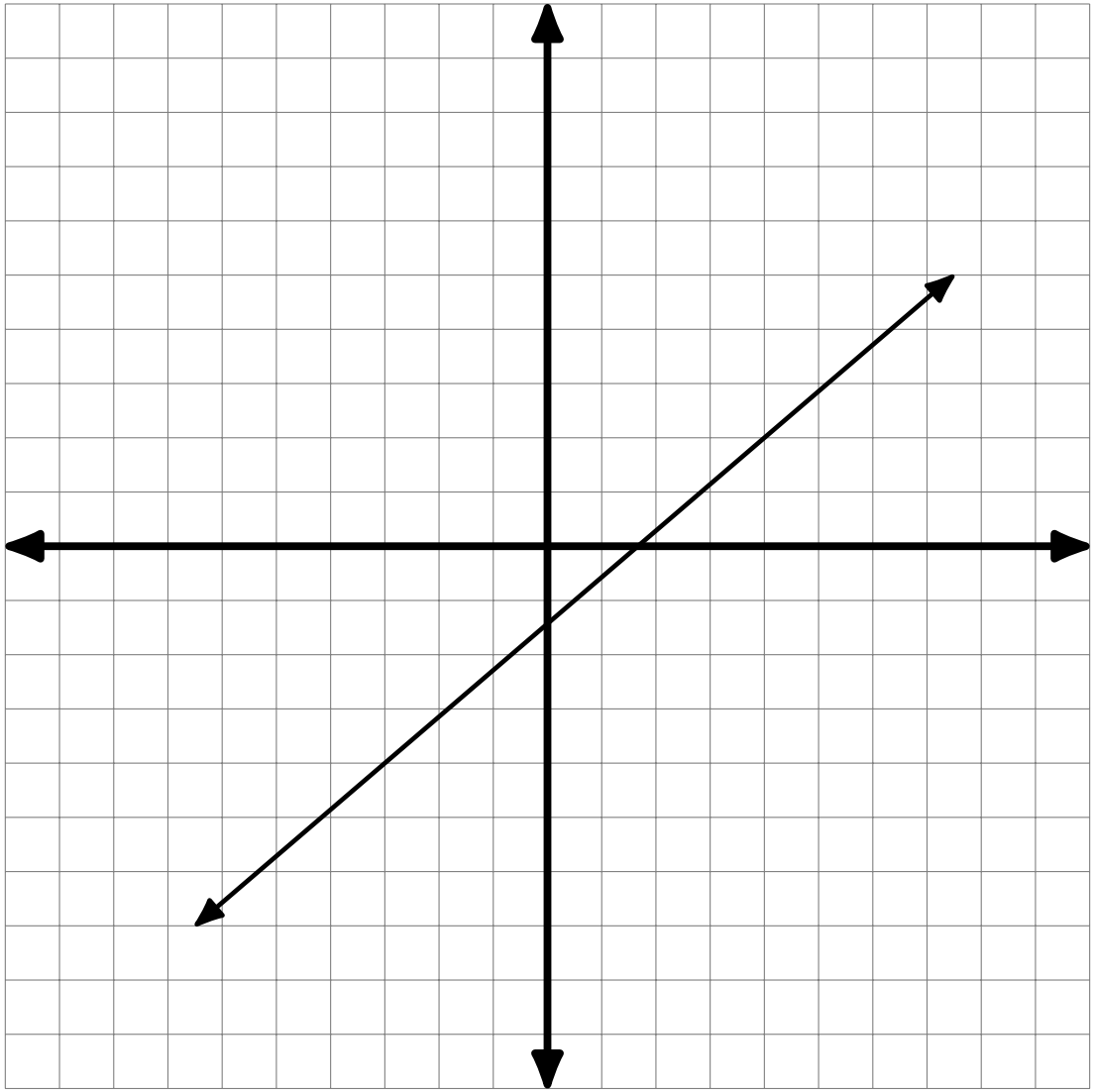
Case 1: If two points on the line are given

The slope $m$ of the line passing through two points $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$ is given by

$$m = \frac{y_2 - y_1}{x_2 - x_1}, \text{ where } x_1 \neq x_2.$$

# Example 1

Case 1: If two points on the line are given



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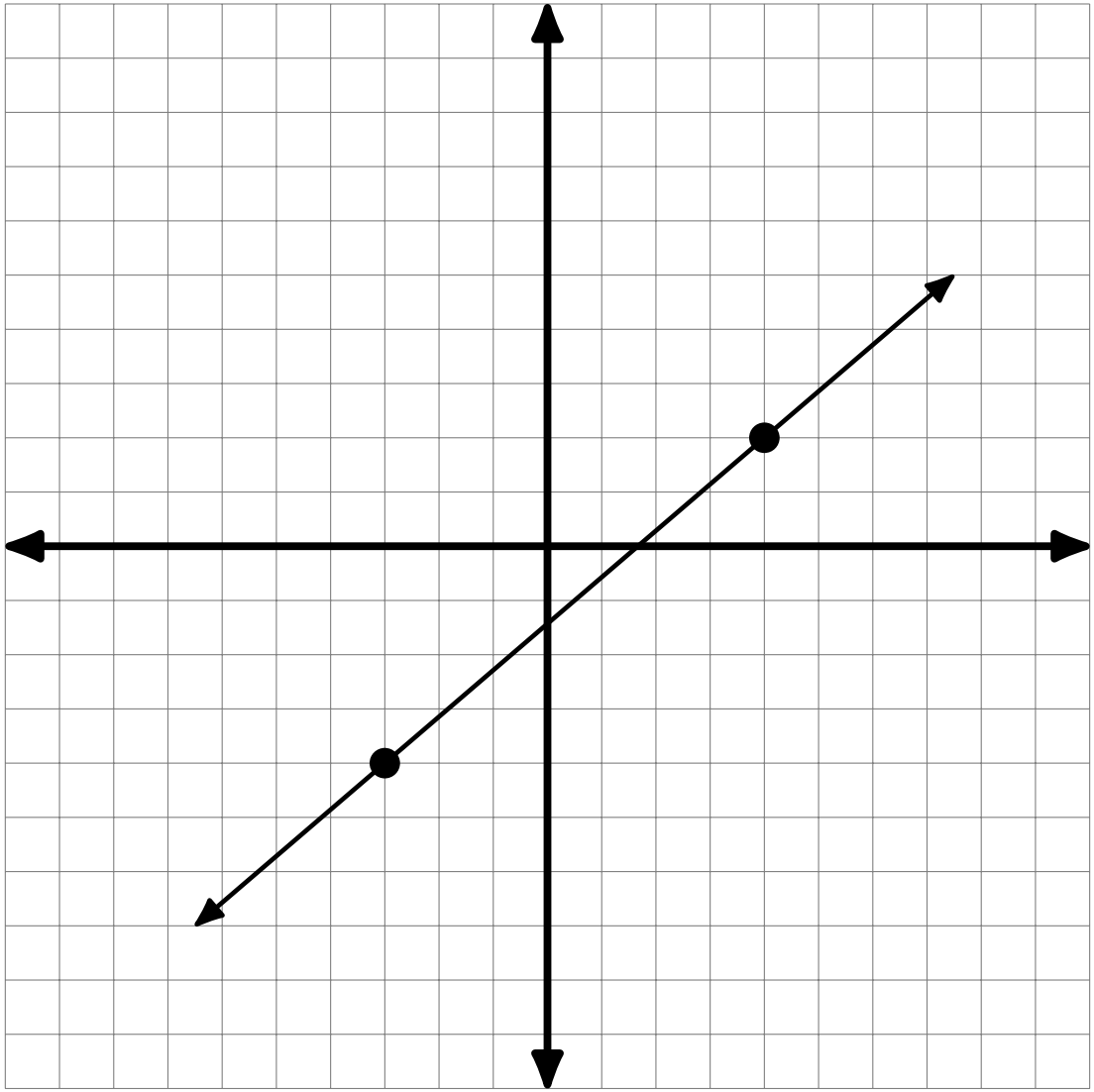

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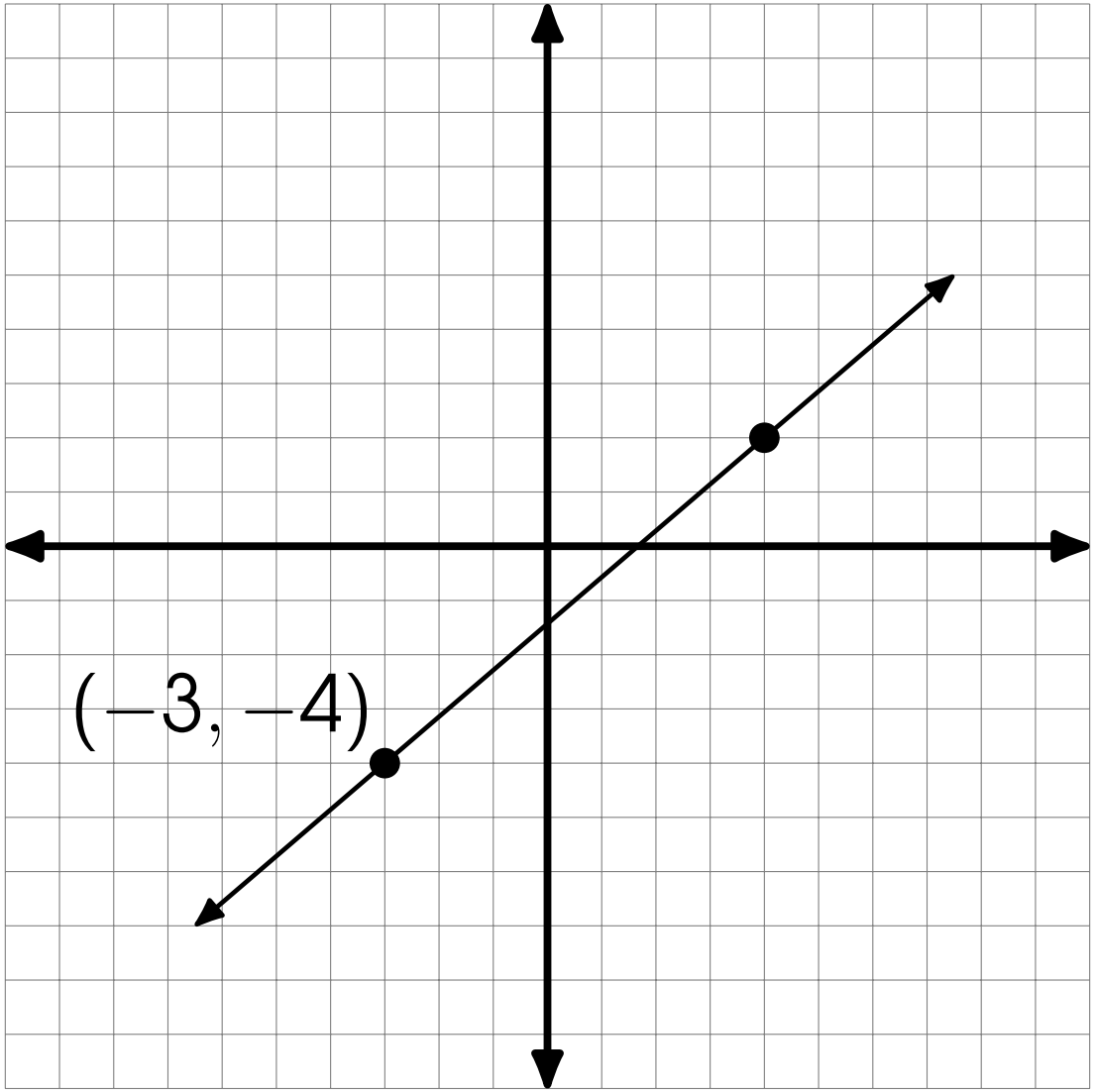

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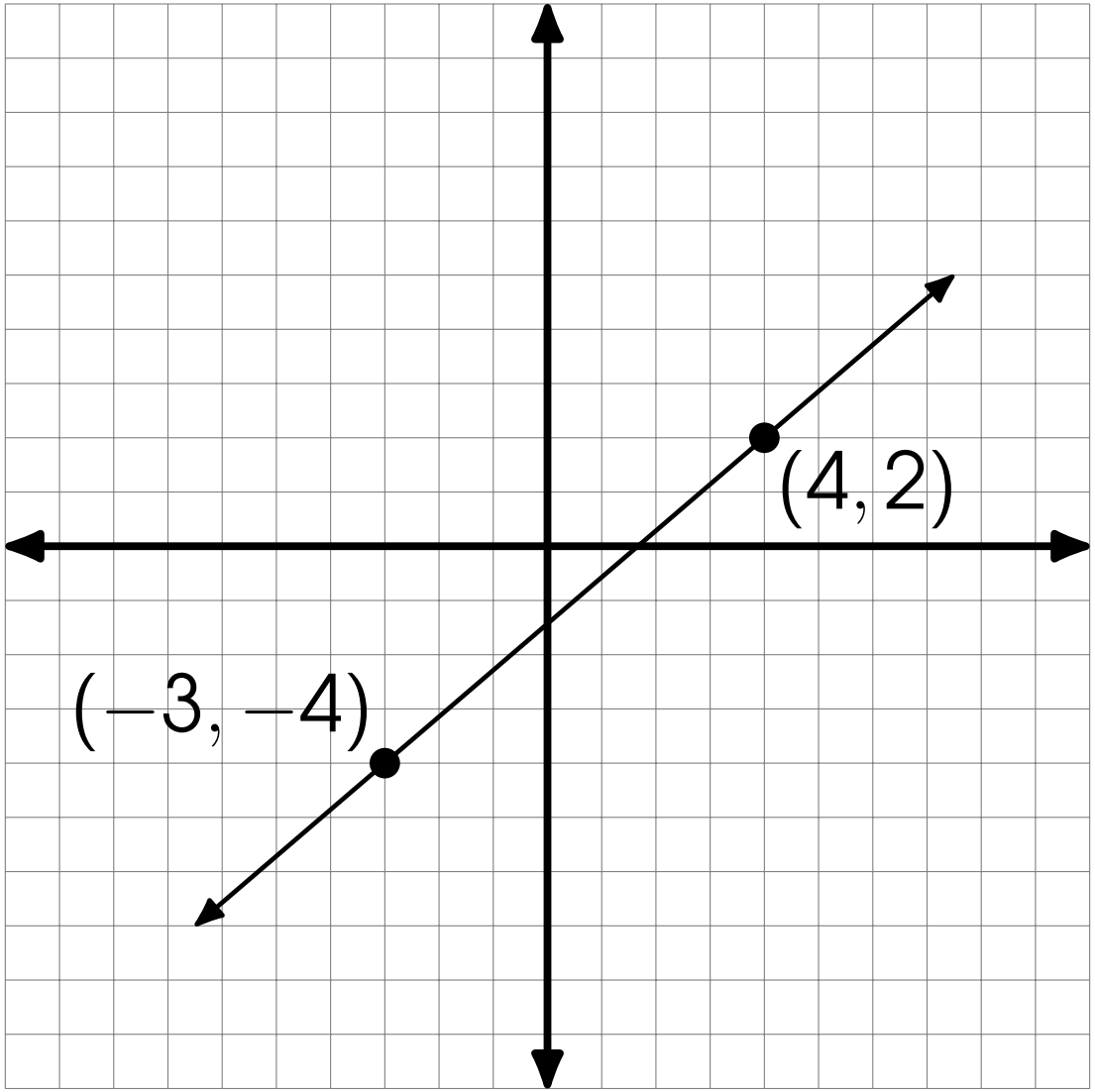

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$\therefore$ the slope is $\frac{6}{7}$

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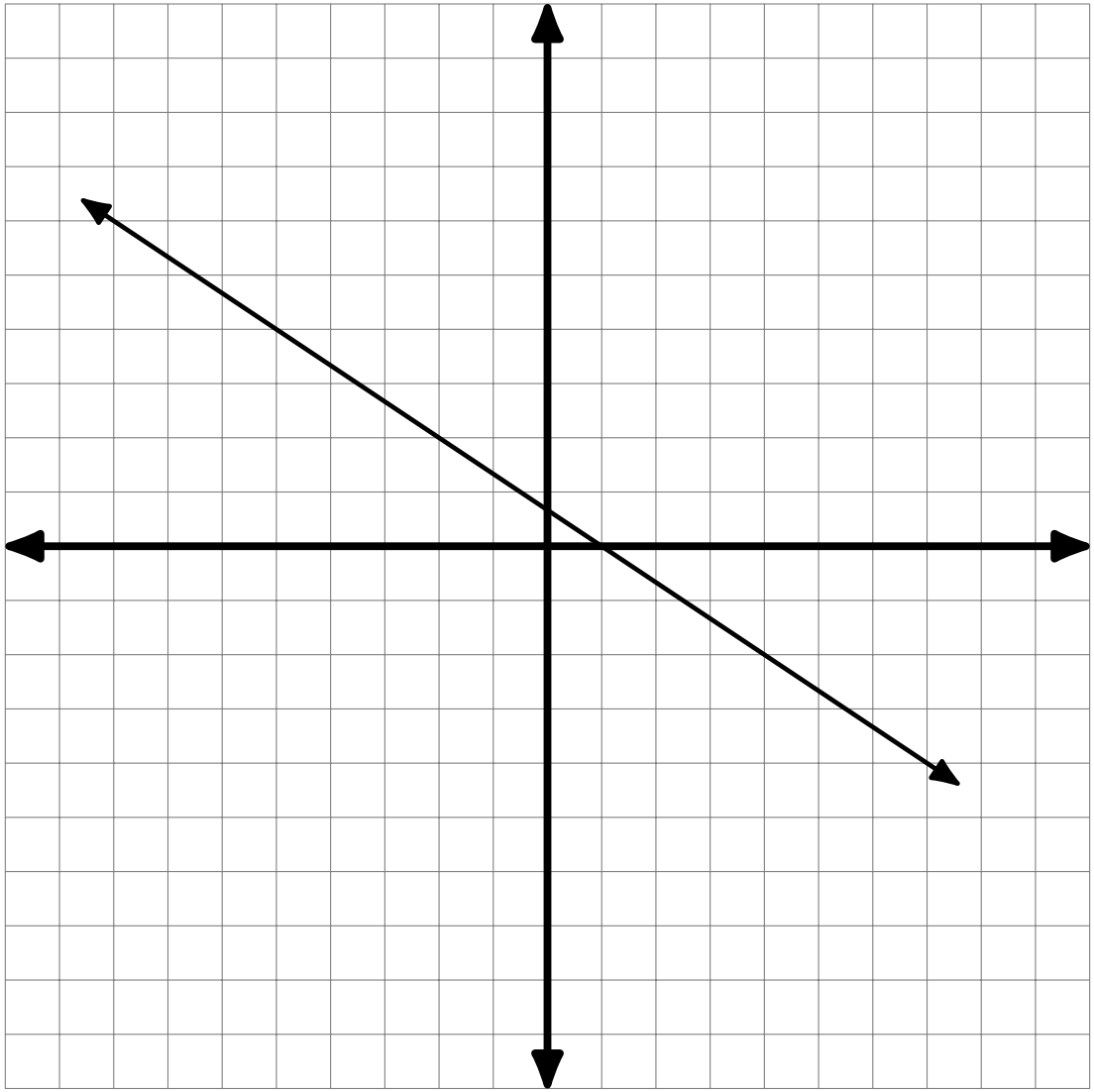

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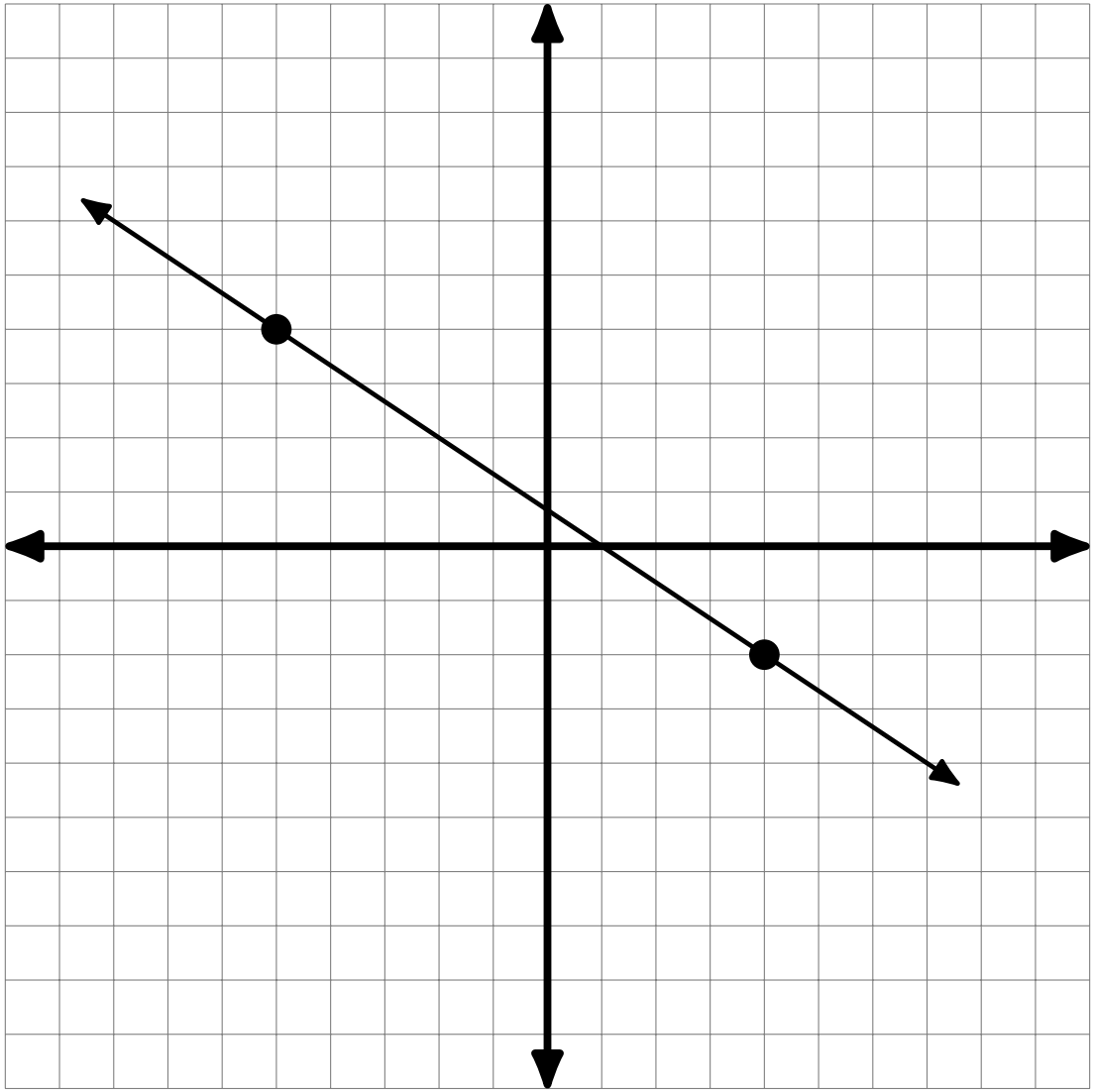

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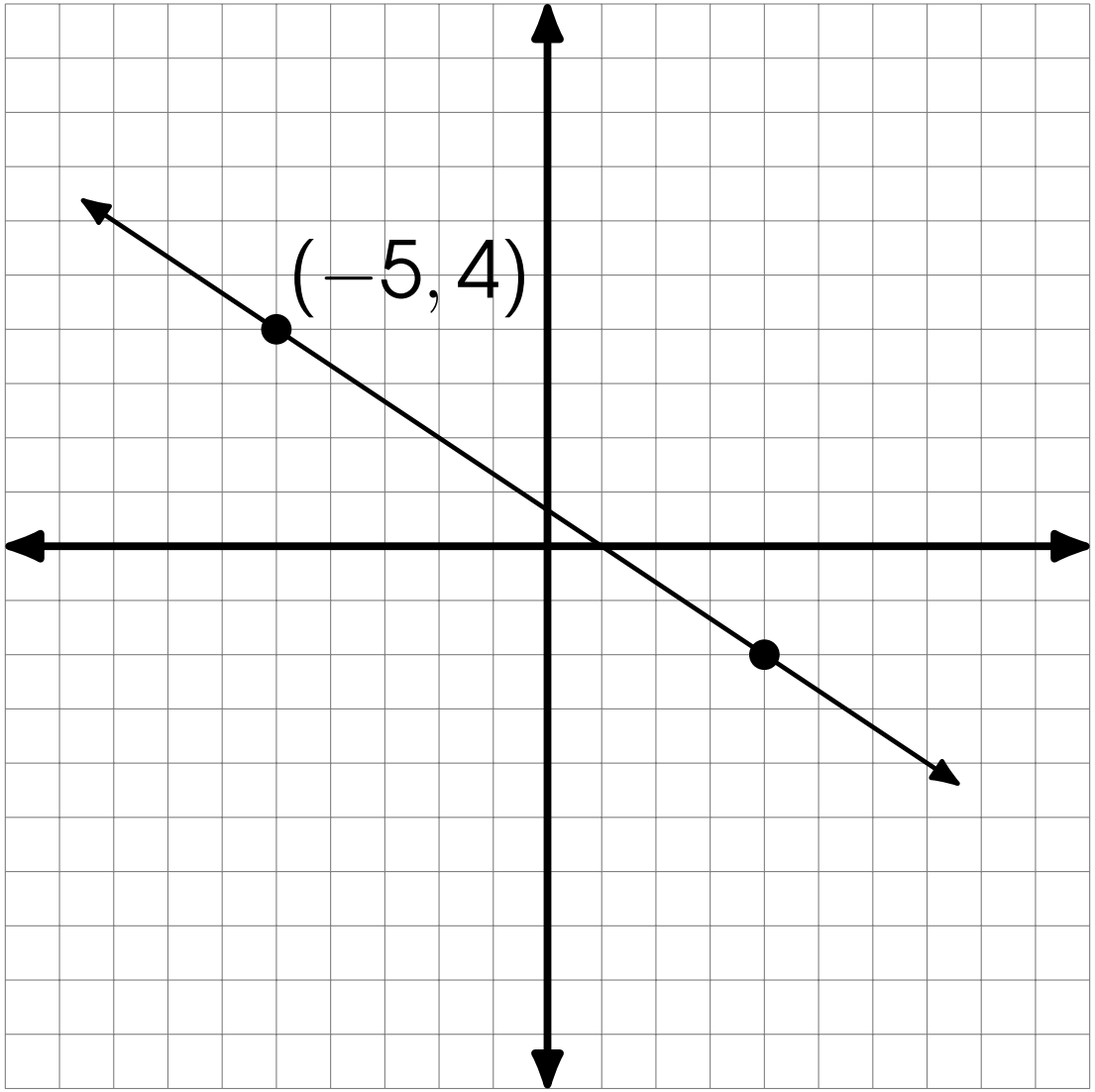

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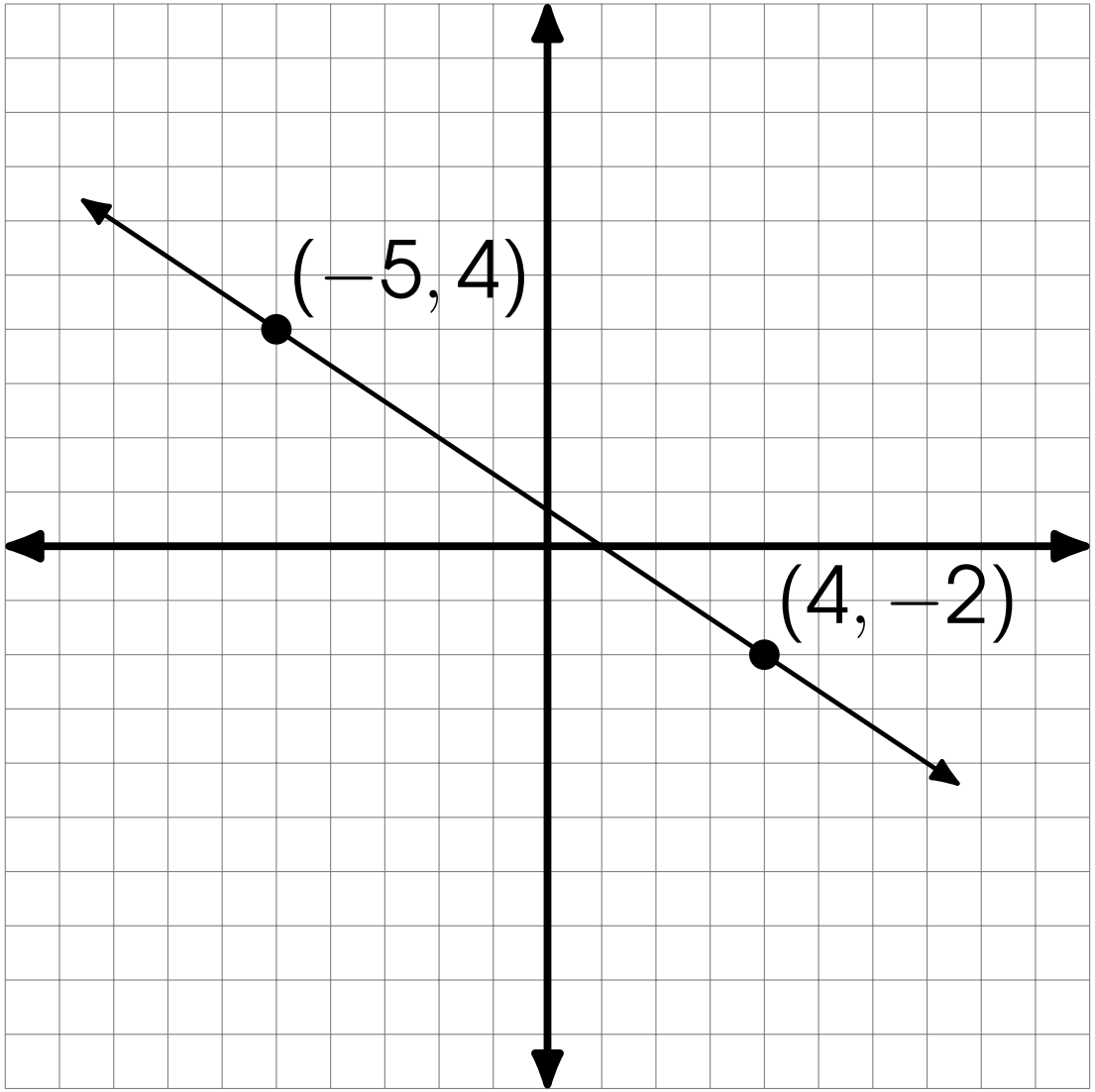

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$$m = \frac{-6}{9} = \frac{-2}{3}$$

$\therefore$ the slope is $-\frac{2}{3}$

# How to Find the Slope?

Case 2: If the equation is given

If the linear equation is written in the form $y = mx + b$, $m$ is the slope, that is, the slope is always the numerical coefficient of $x$.

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Find the slope of the line given each equation:

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   $y = -2x + 4$

   $m = -2$

# How to Find the Slope?

Case 3: If the graph is given

$$\text{slope} = m = \frac{\text{rise}}{\text{run}} = \frac{\text{vertical change}}{\text{horizontal change}}$$

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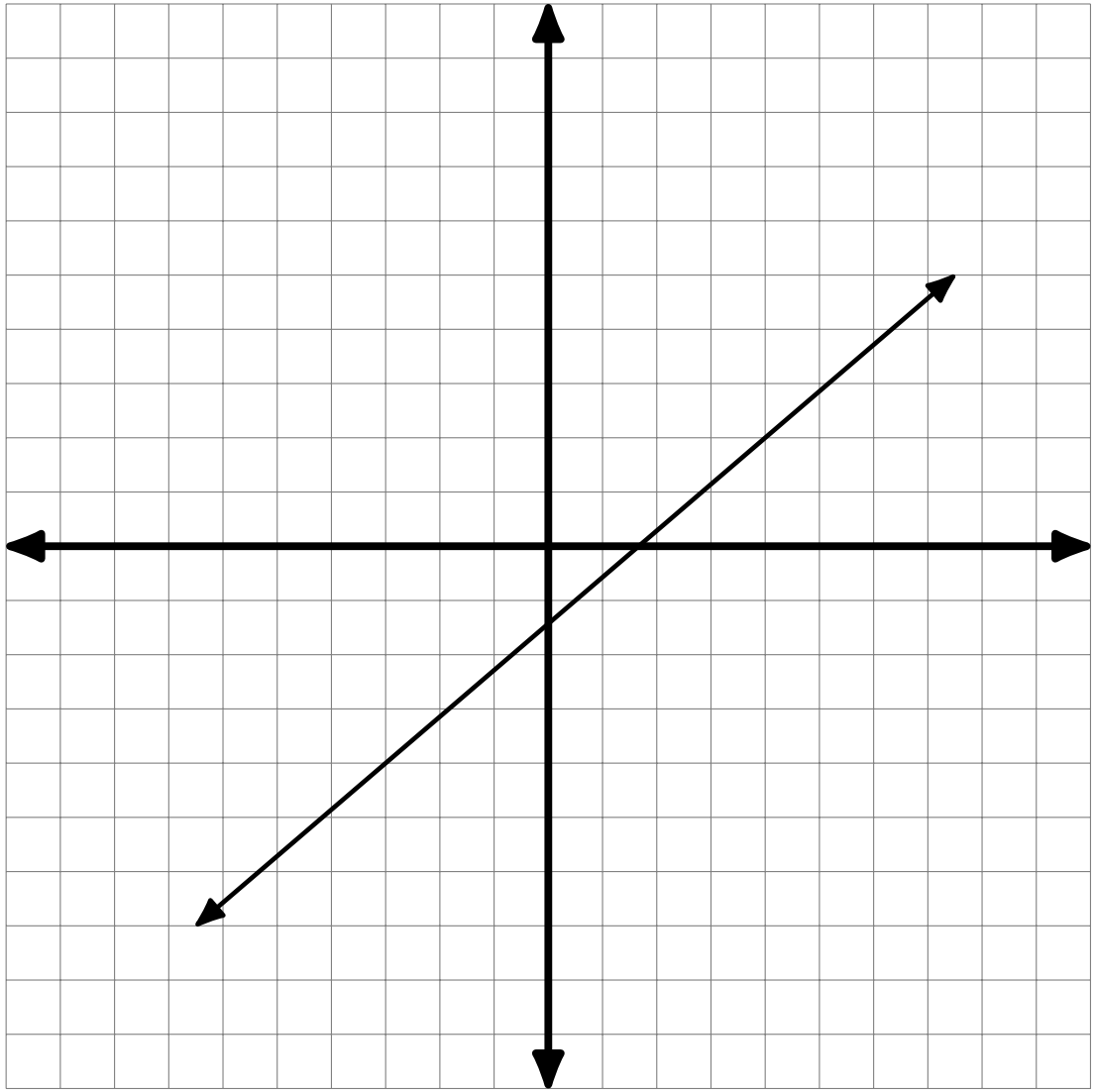

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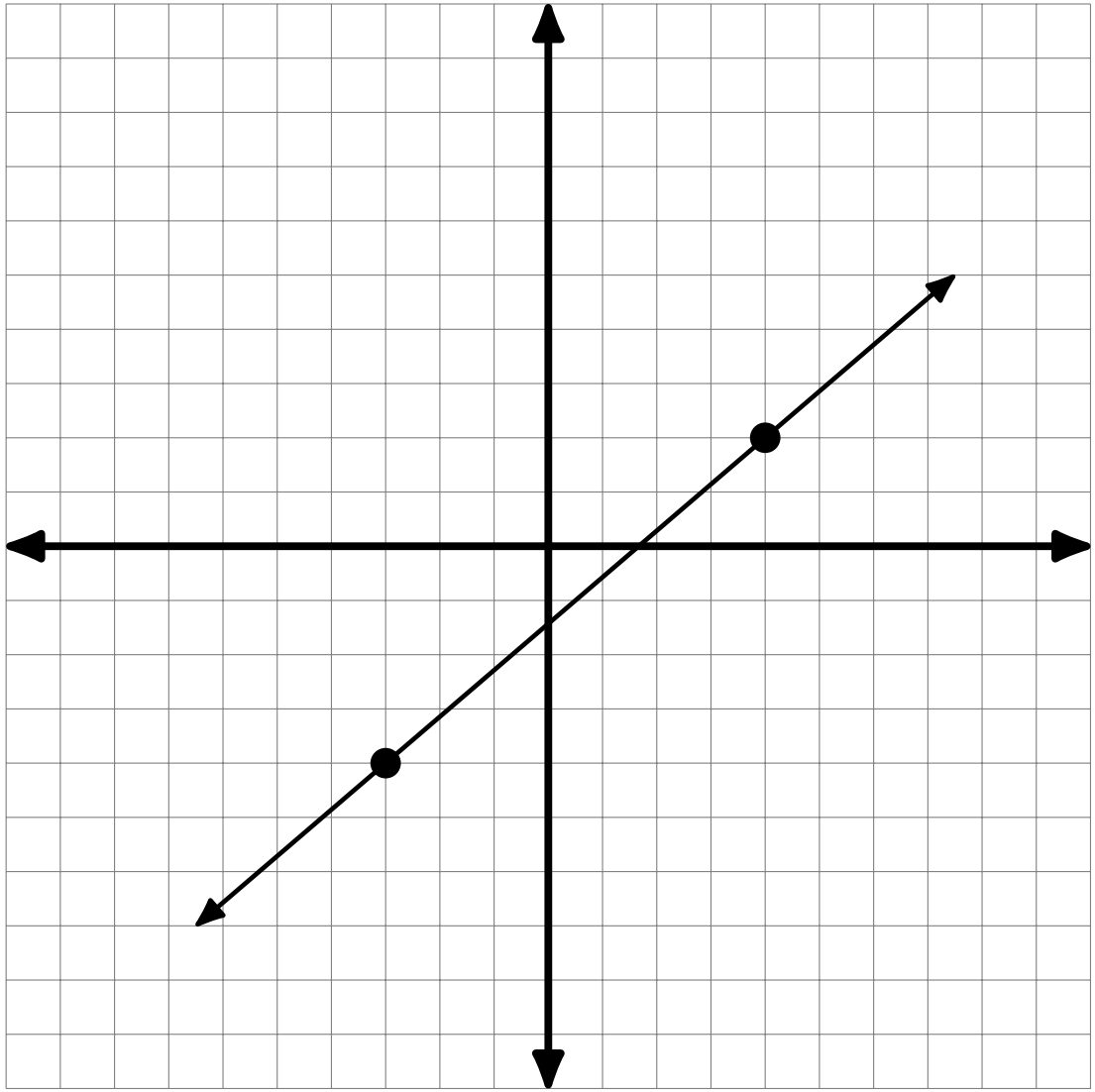

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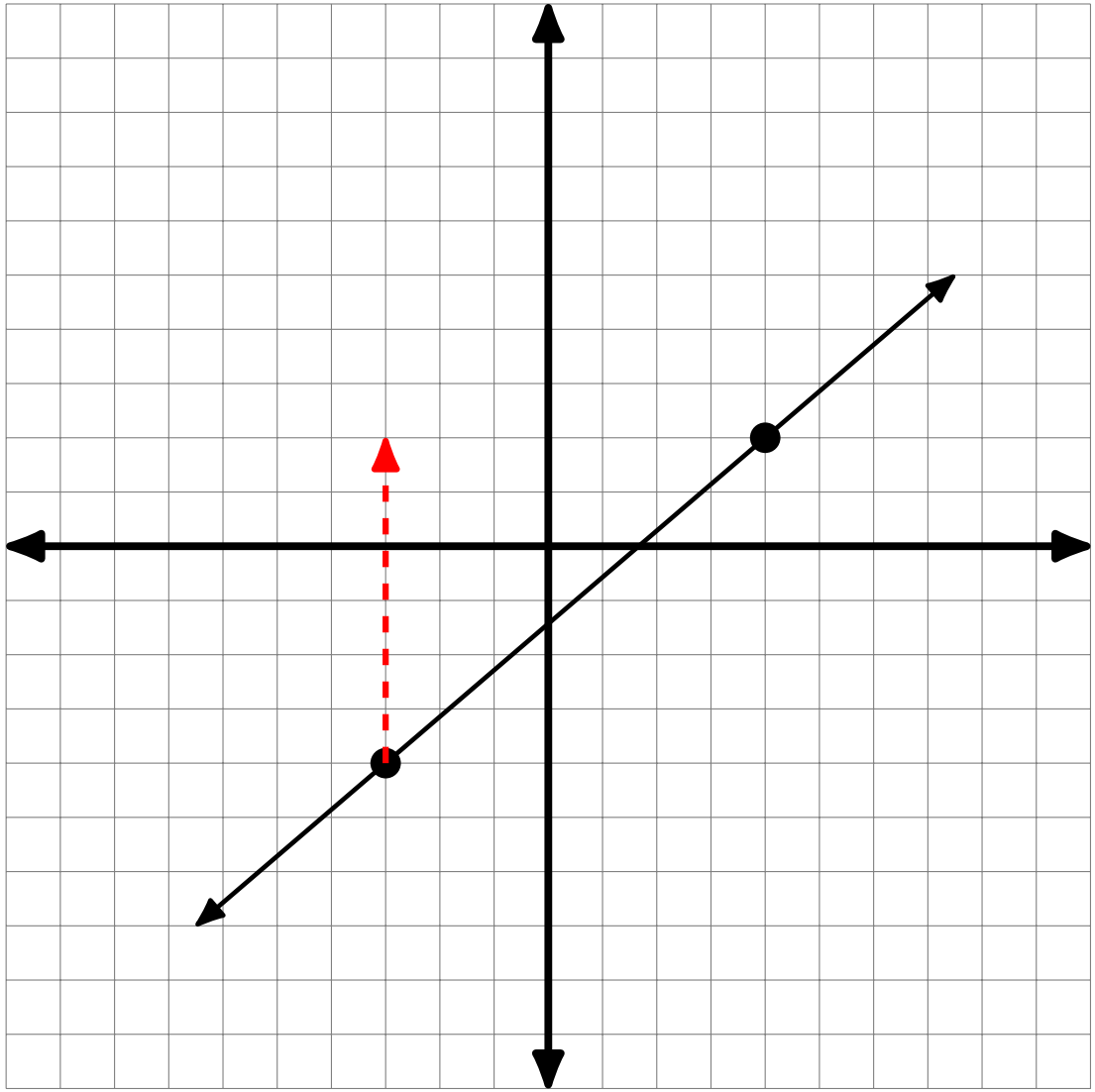

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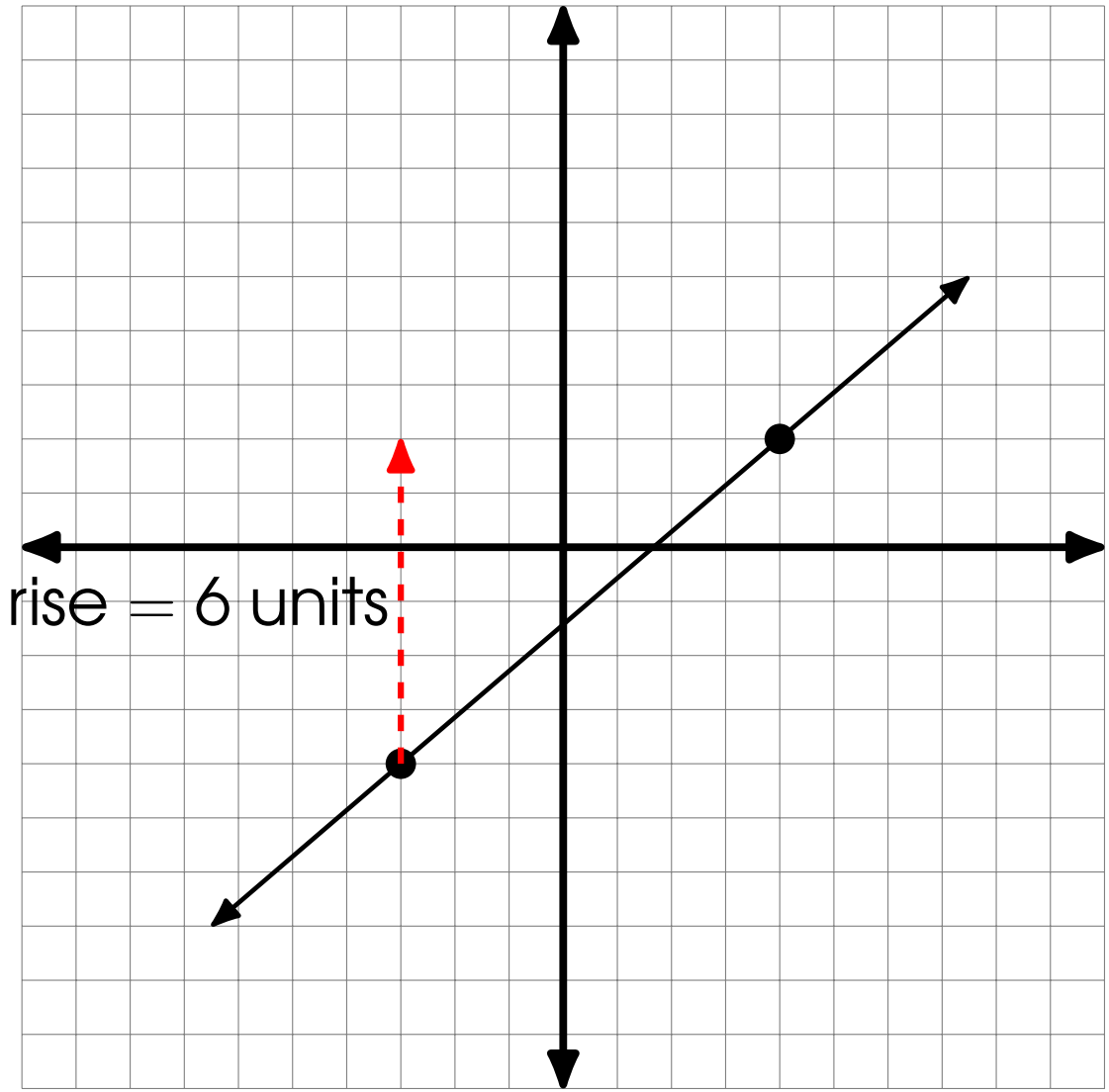

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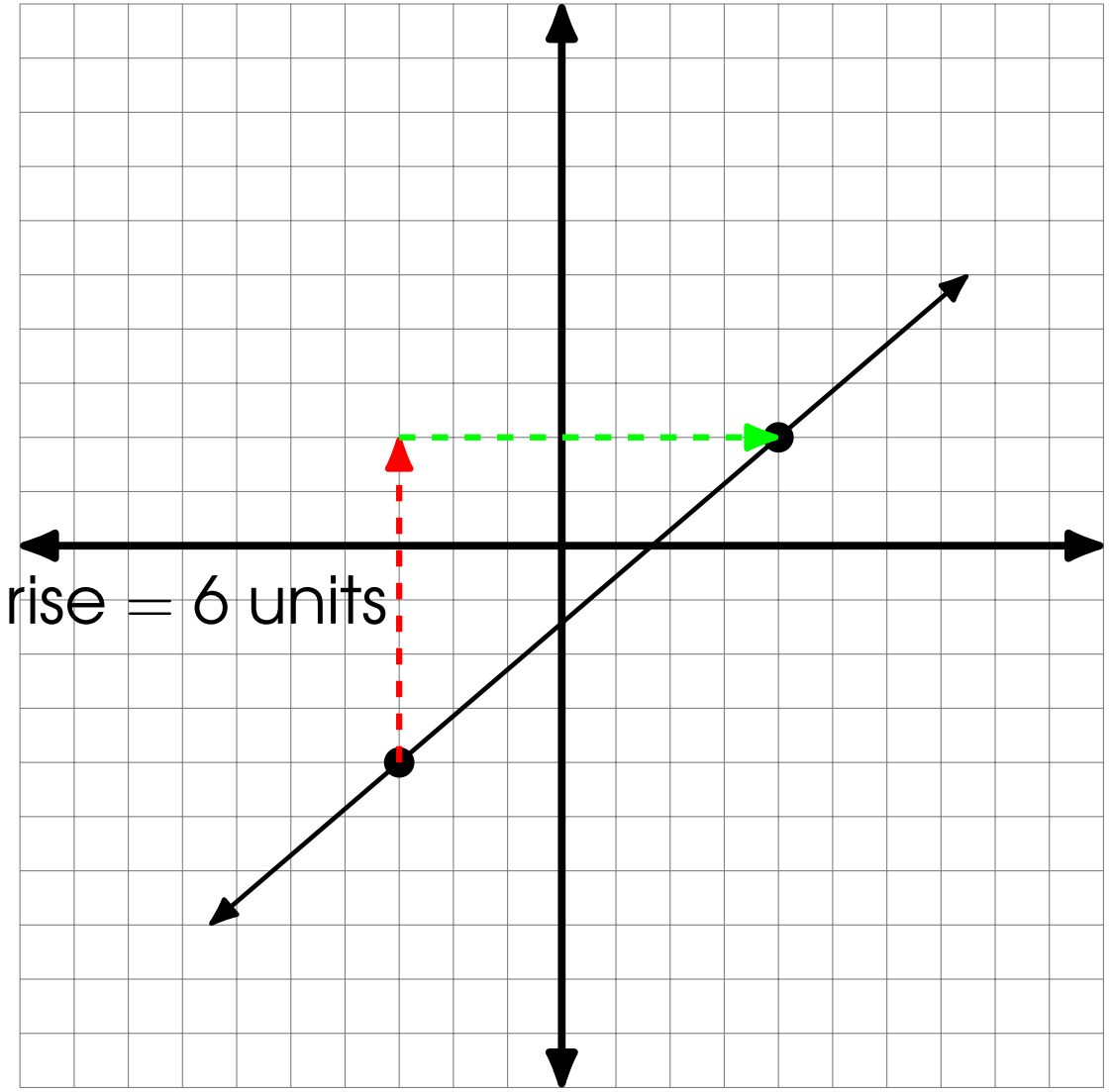

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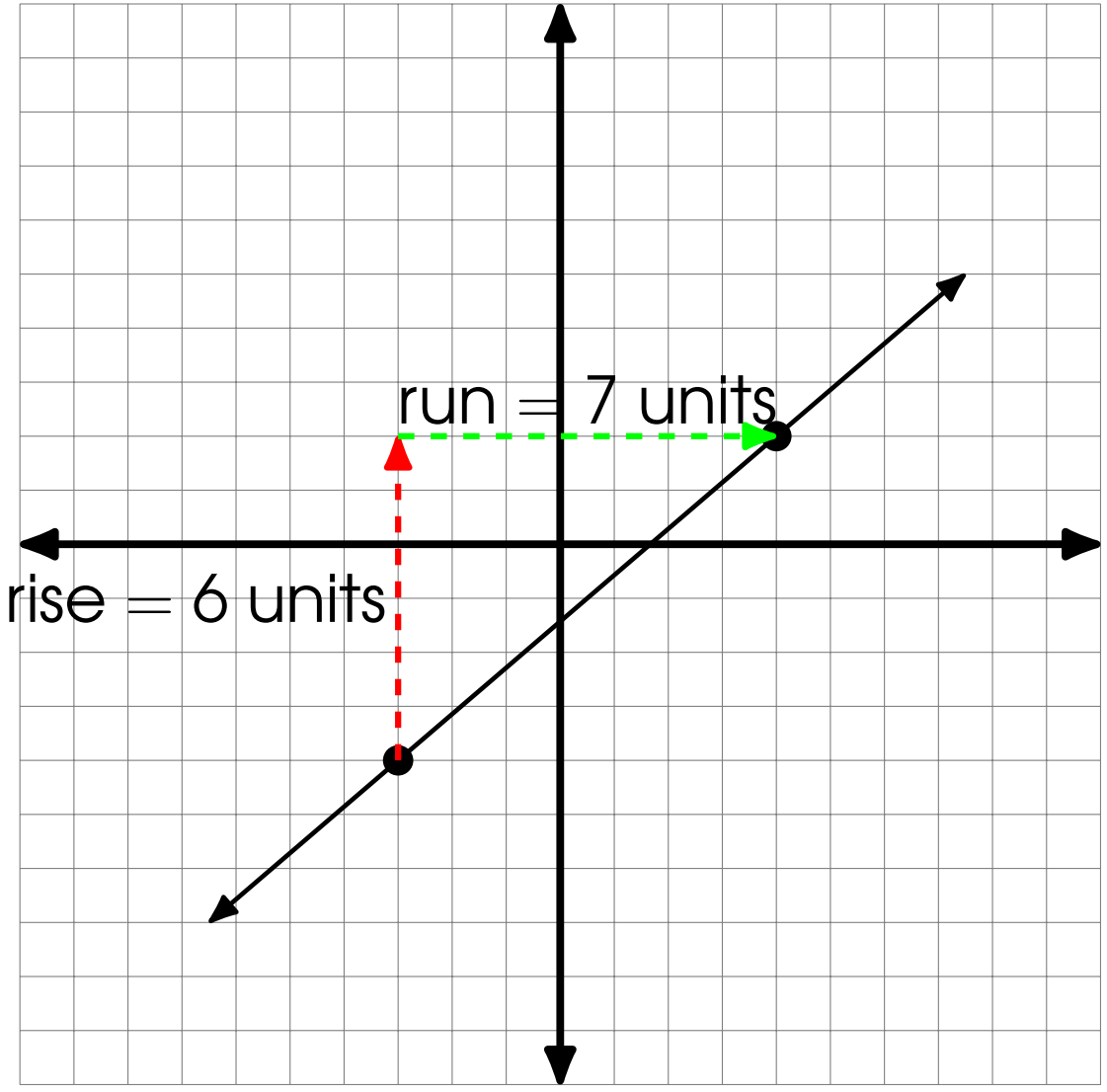

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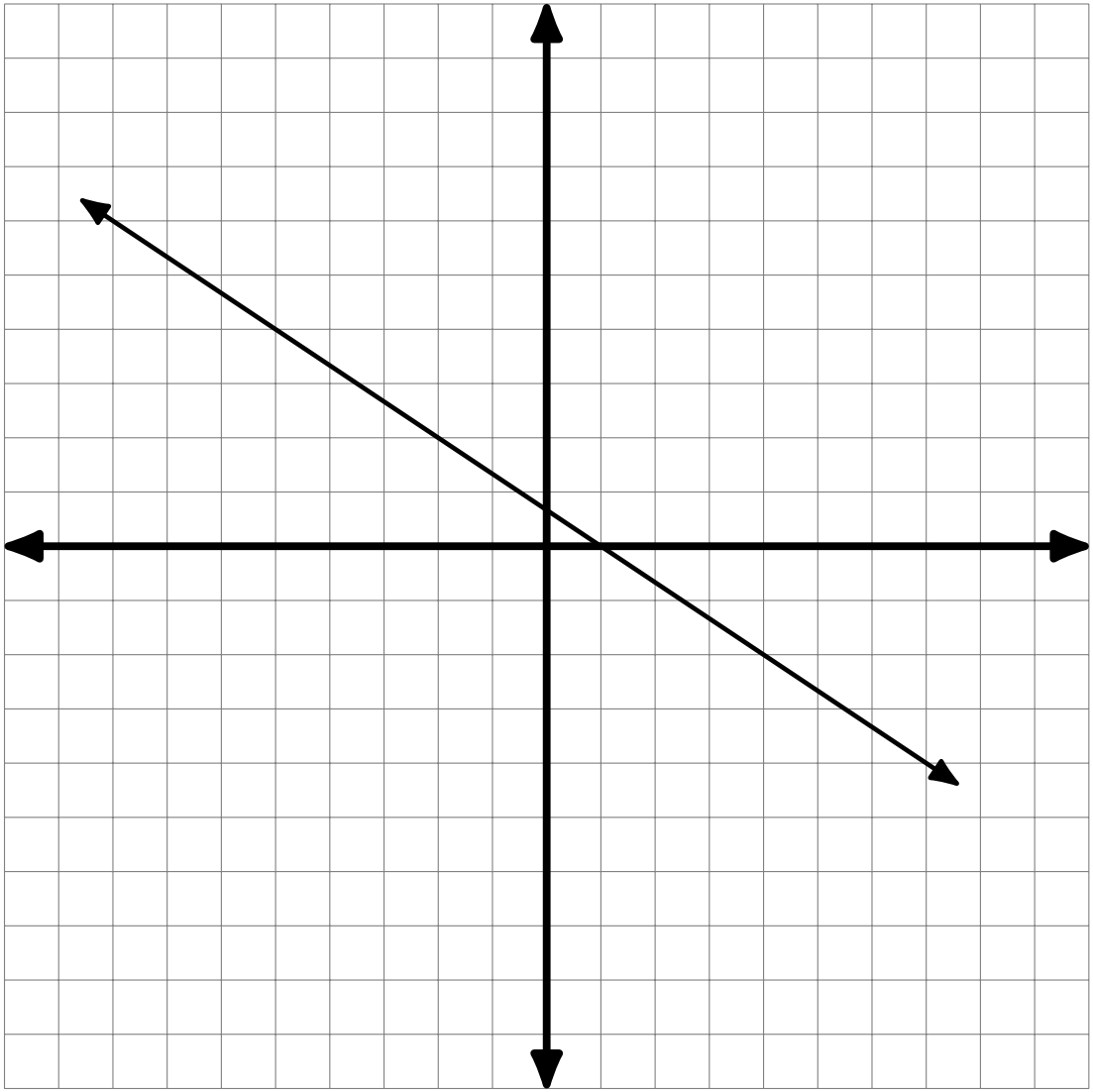

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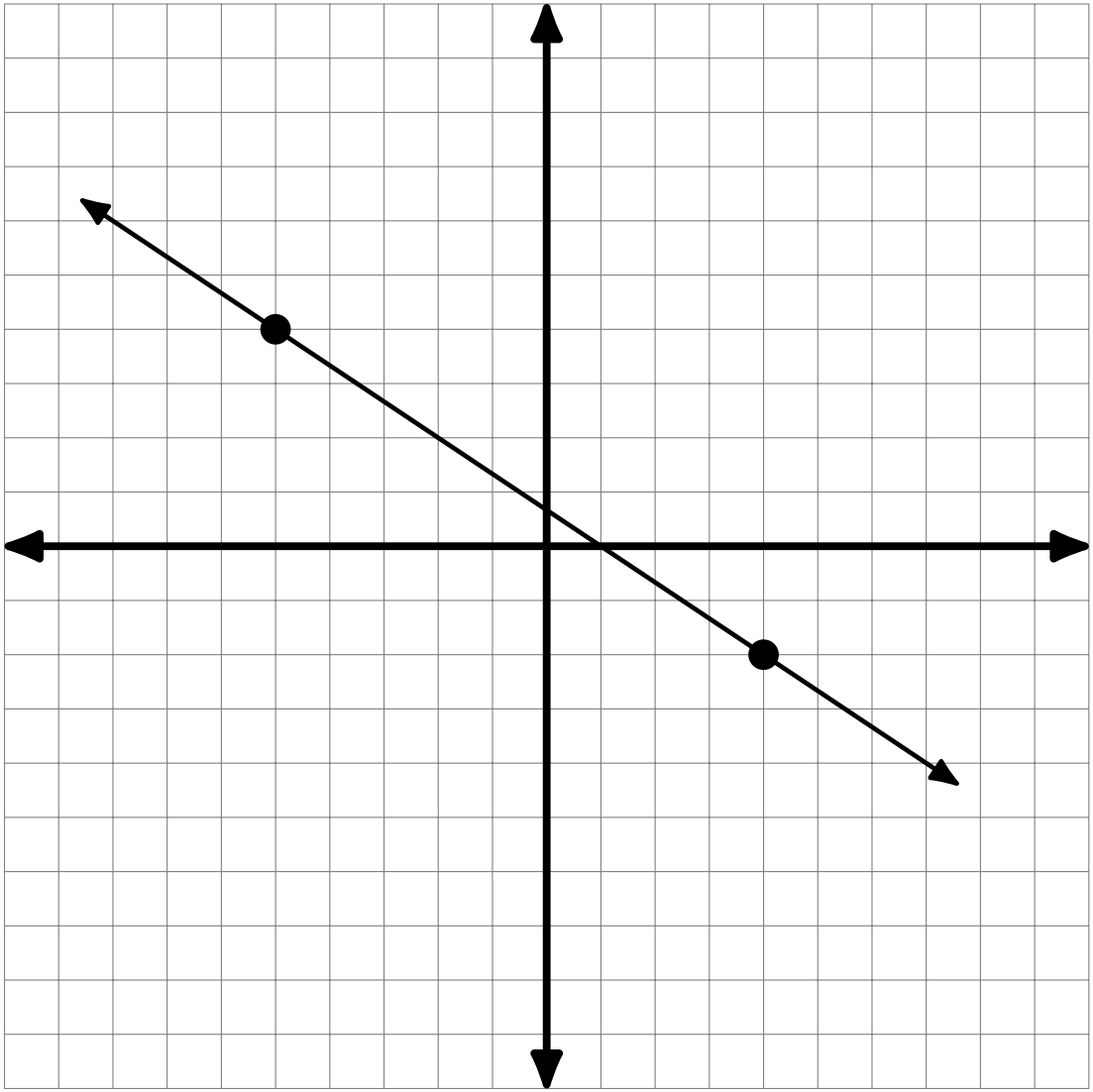

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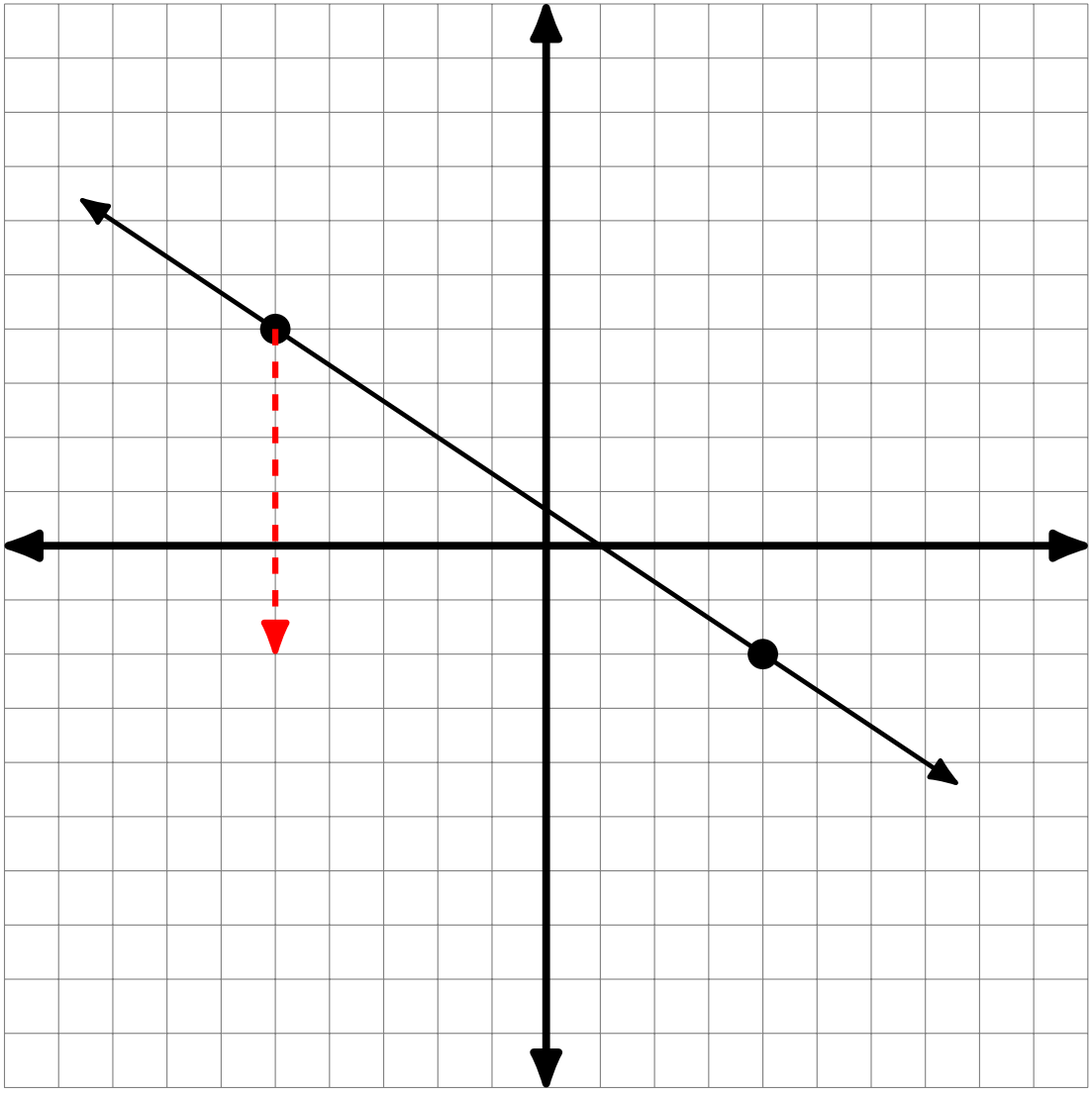

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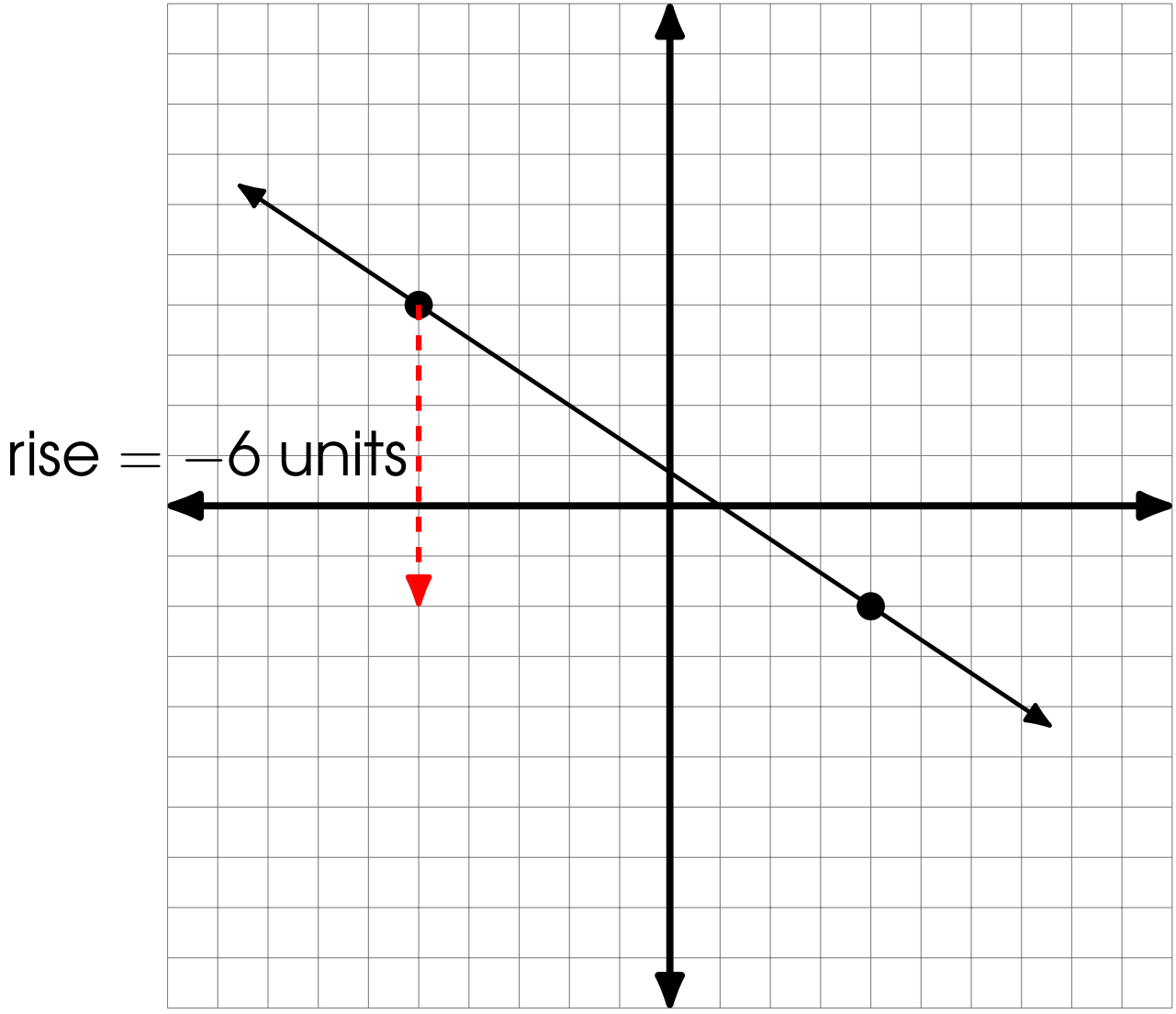

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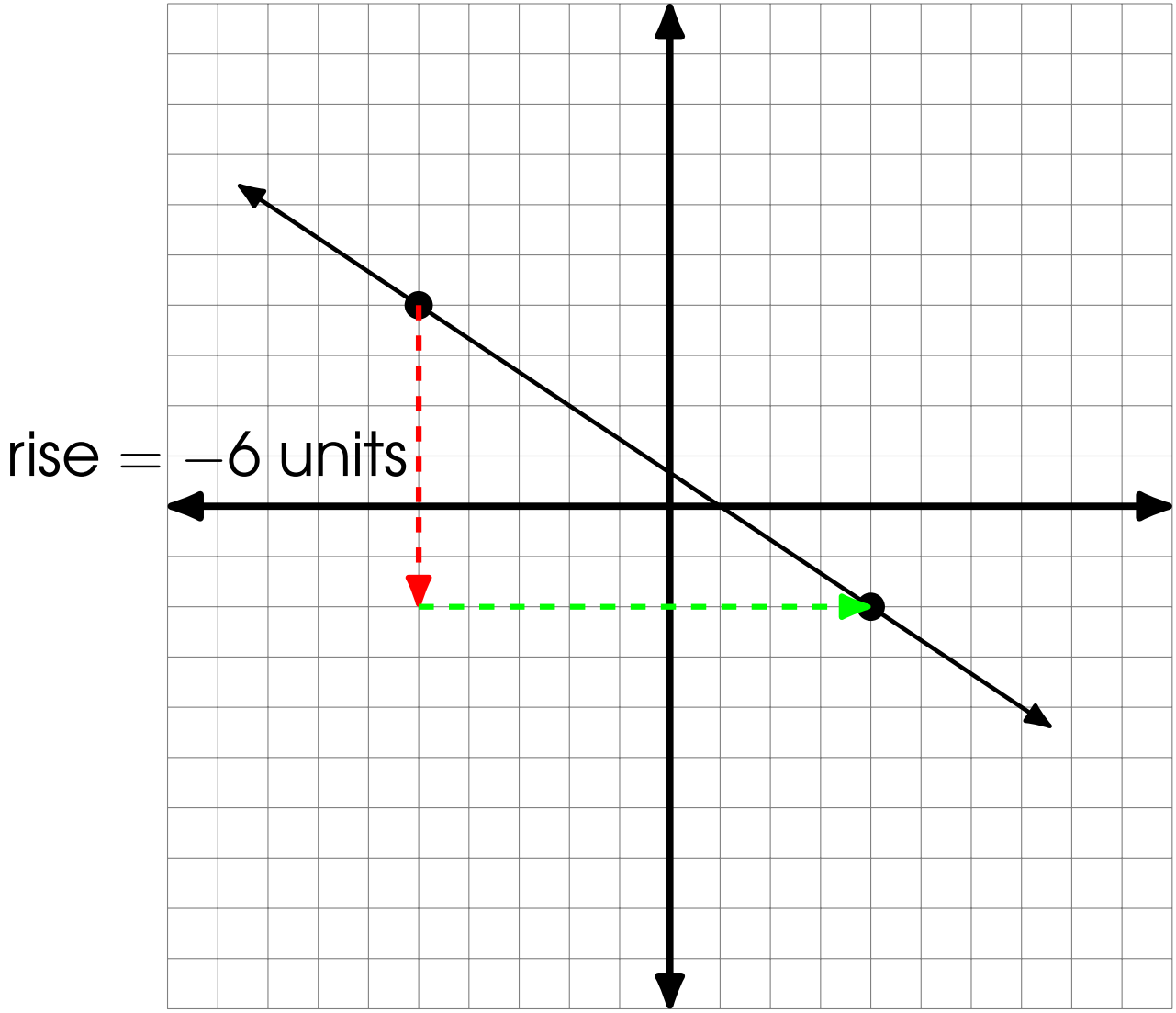

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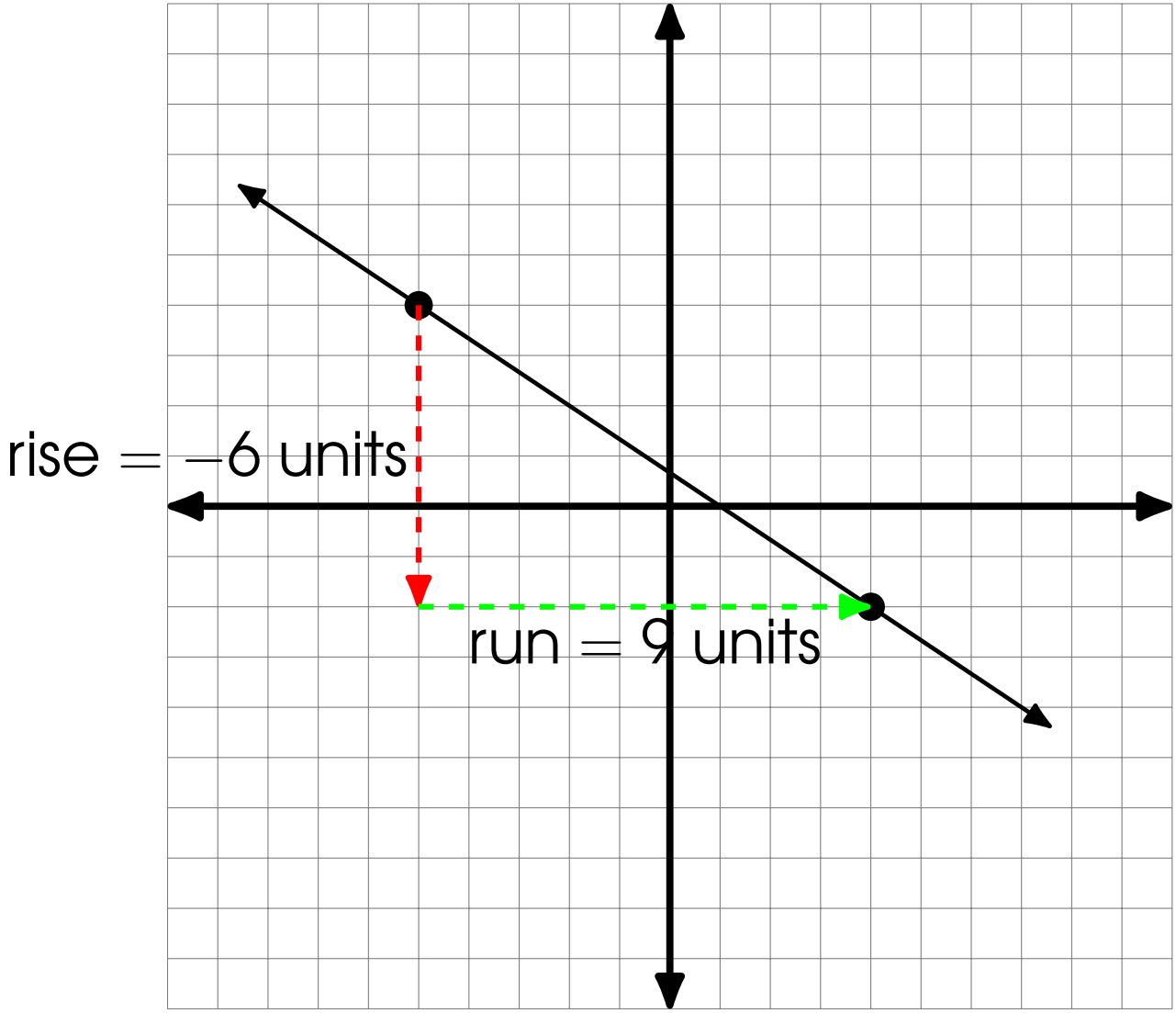

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$\therefore$ the slope is $-\frac{2}{3}$

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3. If the line is parallel to the x-axis (horizontal line), the slope is zero.
4. If the line is parallel to the y-axis (vertical line), there is no slope. Vertical lines have undefined slope.

# Thank you for watching.