

# WRITING EQUATIONS IN POINT-SLOPE FORM

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Algebra 1H



# POINT-SLOPE FORM

$$y - \textcolor{red}{y_1} = \textcolor{purple}{m}(x - \textcolor{blue}{x_1})$$

↑            ↑            ↑

**y-coordinate   slope   x-coordinate**

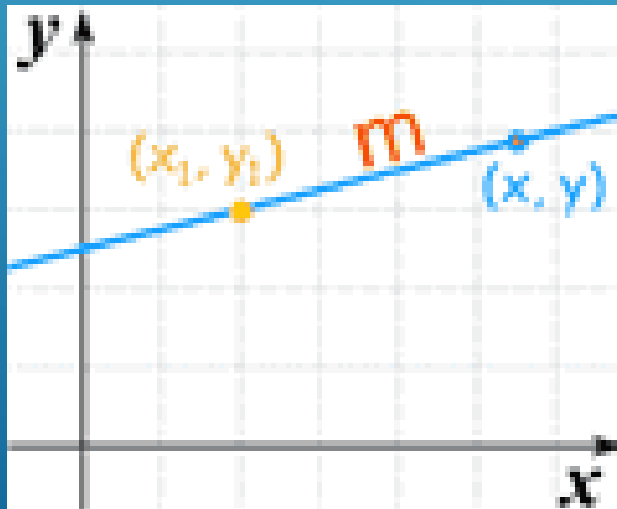
Need to know:

- ◆ Slope ( $m$ )
- ◆ a point on the line  $(x_1, y_1)$

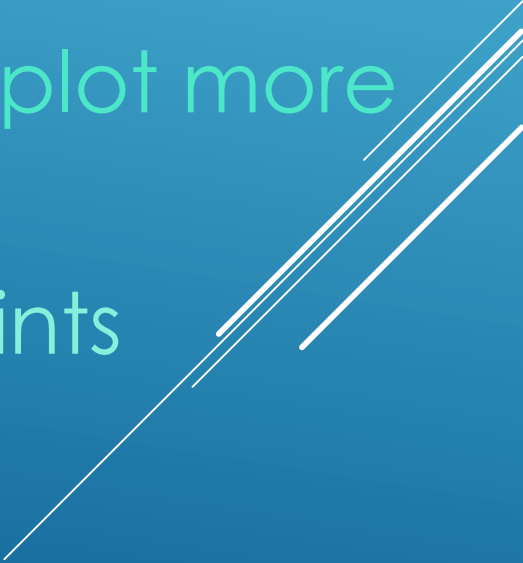
$$(X,Y) \text{ VS. } (X_1,Y_1)$$

► What's the difference?

- $x$  and  $y$  represent **any** point on the line
- $(x_1, y_1)$  represents one specific point on the line

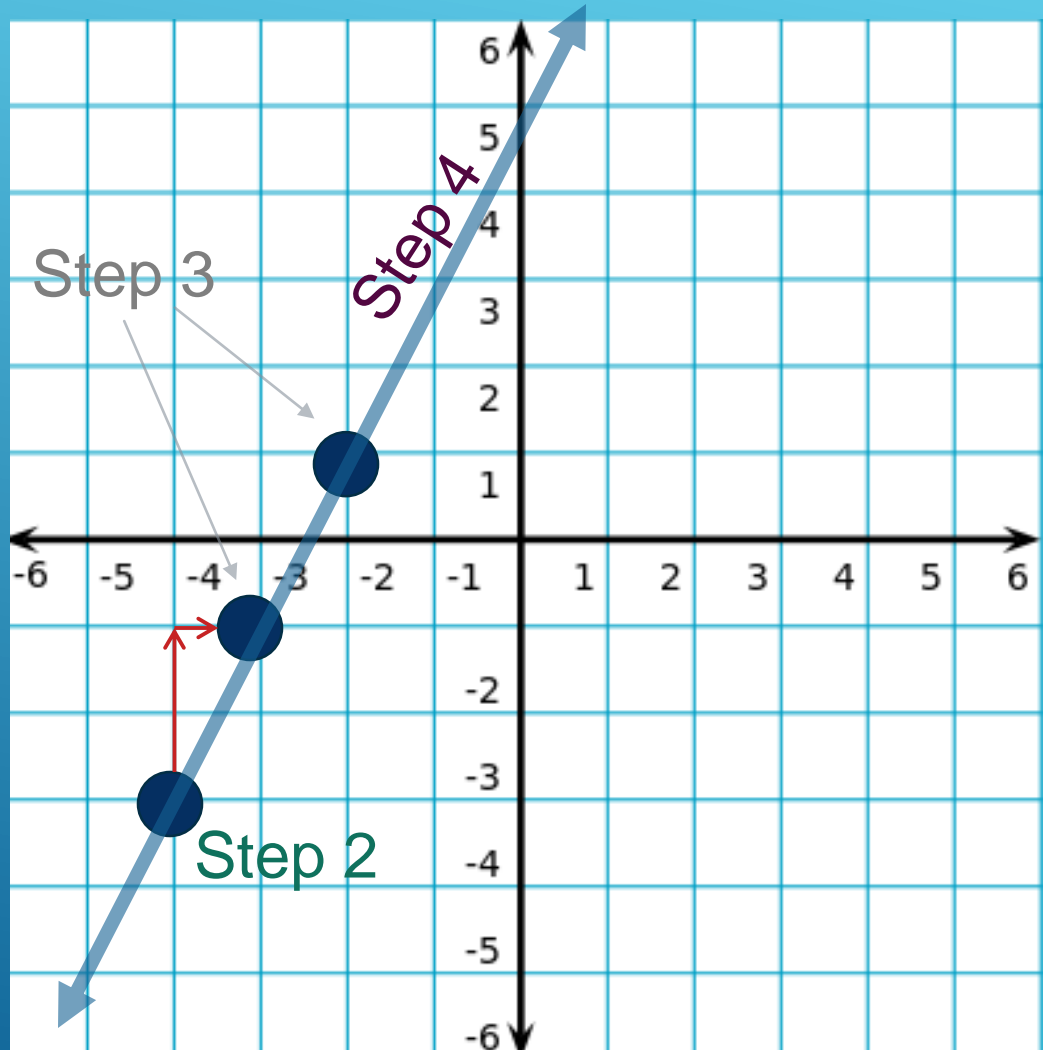


# GRAPHING FROM POINT-SLOPE FORM

1. Identify the point that you know  $(x_1, y_1)$  from the equation
  2. Plot that point
  3. Use slope from that point to plot more points
  4. Draw a line through your points
- 
- A series of three parallel white diagonal lines in the bottom right corner of the slide.

EXAMPLE:  $Y + 3 = 2(X + 4)$

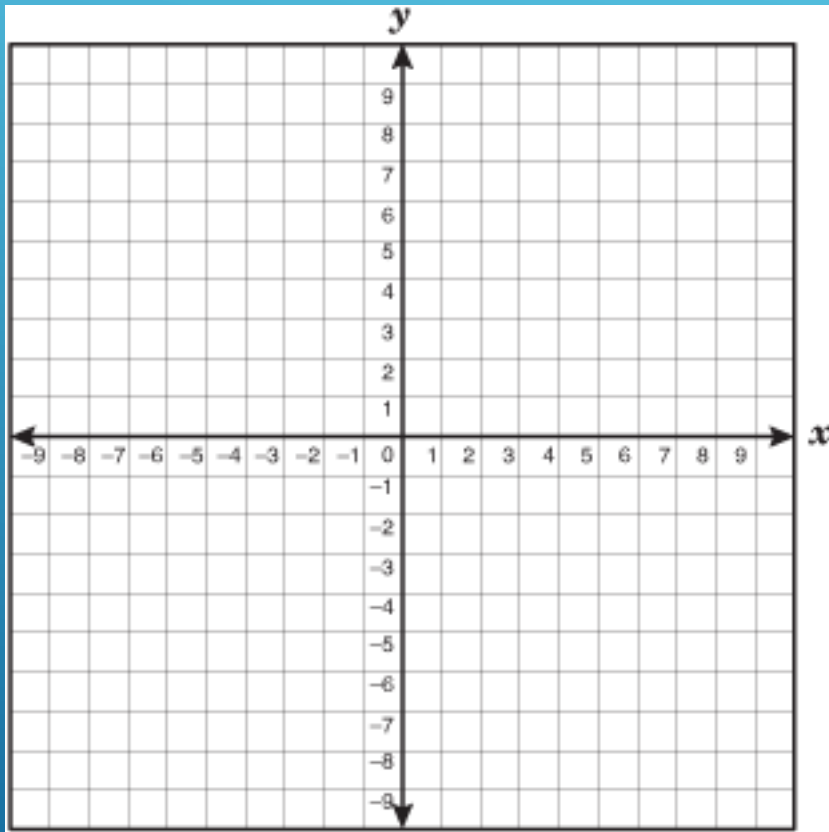
Step 1:  $(-4, -3)$



LET'S PRACTICE IT!😊

A series of several thin, white, parallel diagonal lines extending from the bottom right towards the top right of the slide.

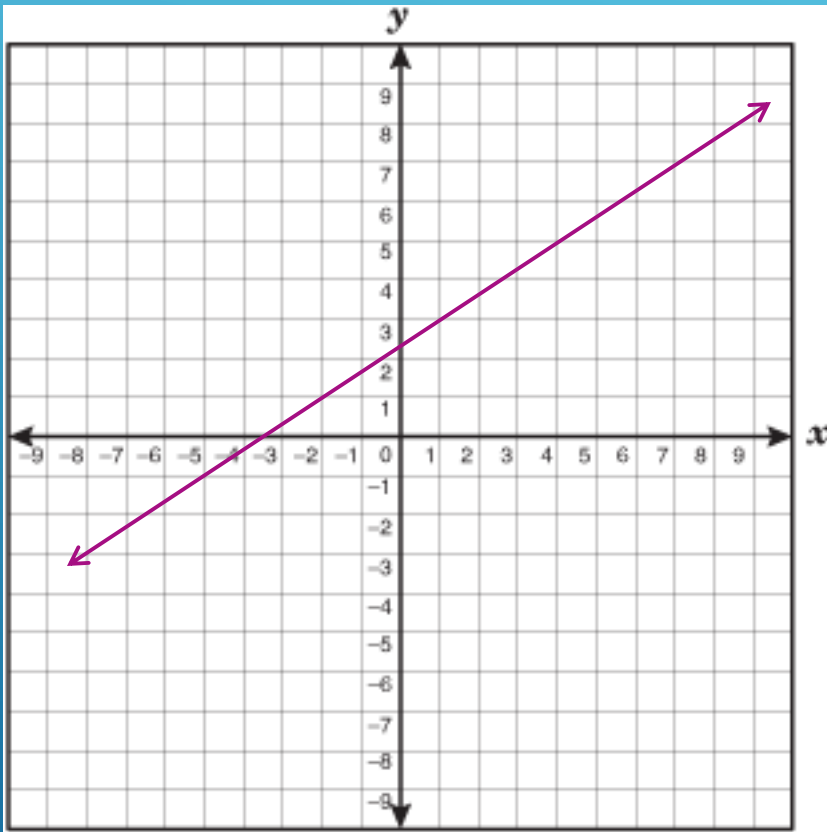
# GRAPHING LINES IN POINT-SLOPE FORM



$$y - 1 = \frac{2}{3}(x + 2)$$



# HOW DID YOU DO?

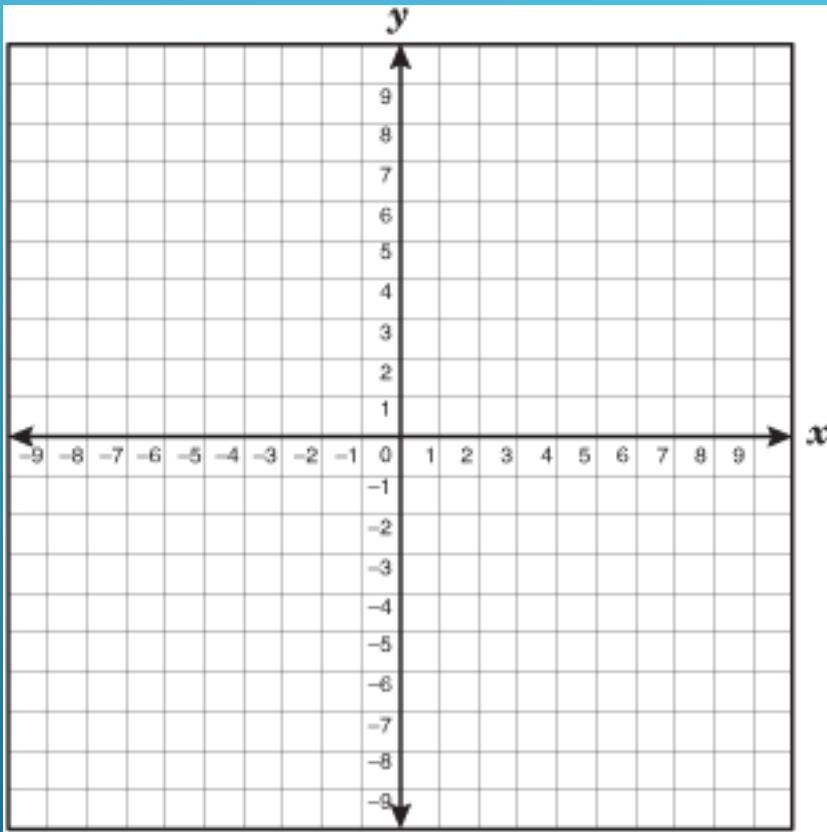


$$y - 1 = \frac{2}{3}(x + 2)$$



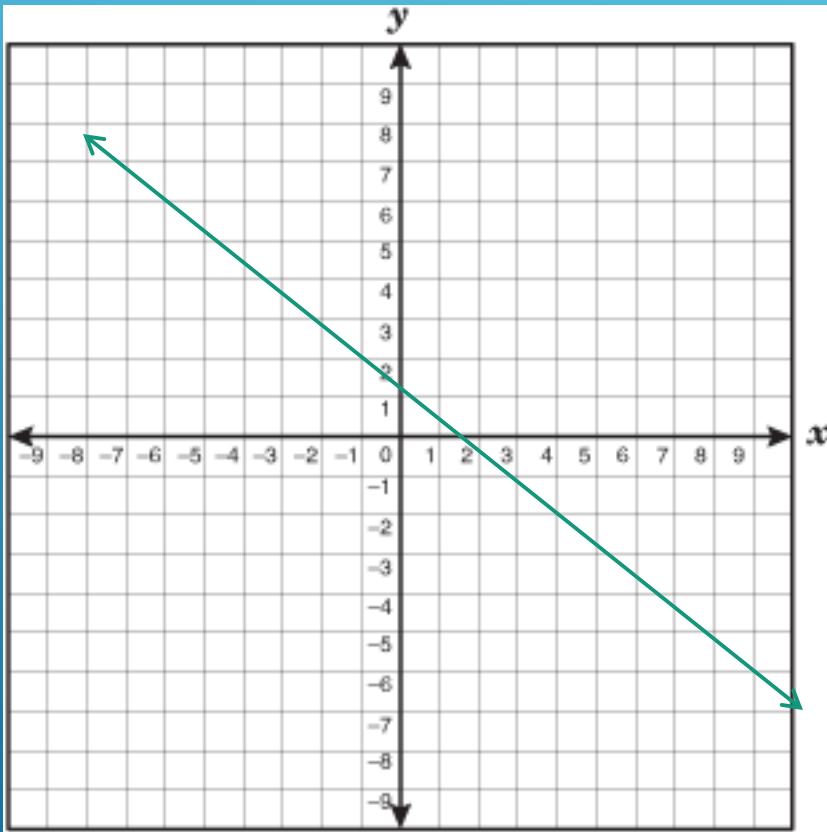


# GRAPHING LINES IN POINT-SLOPE FORM



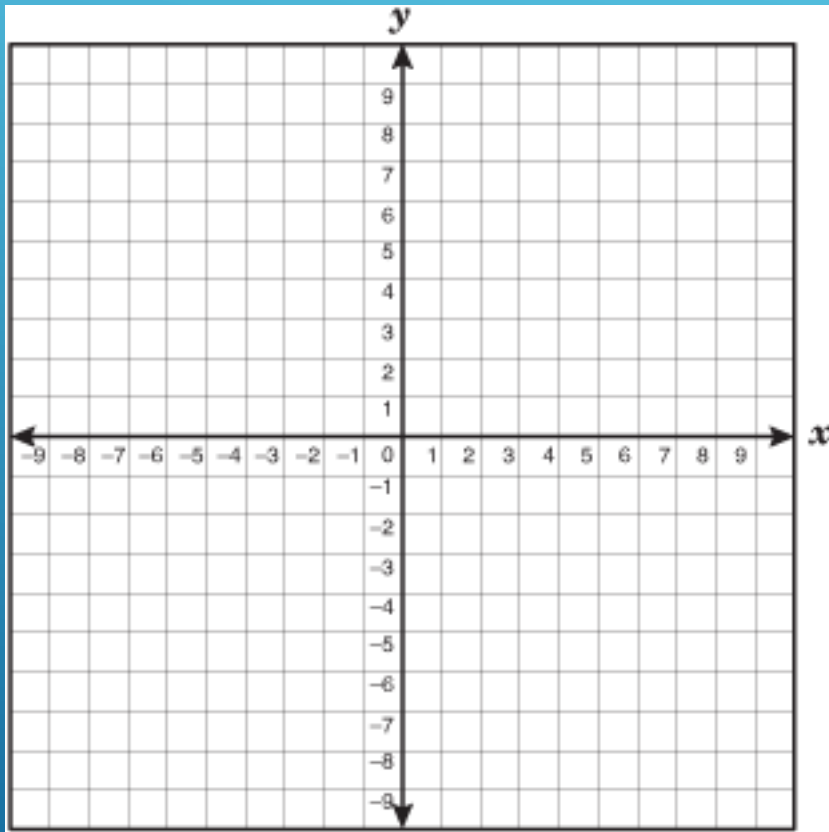
$$y + 2 = -\frac{4}{5}(x - 4)$$

# WERE YOU CORRECT?



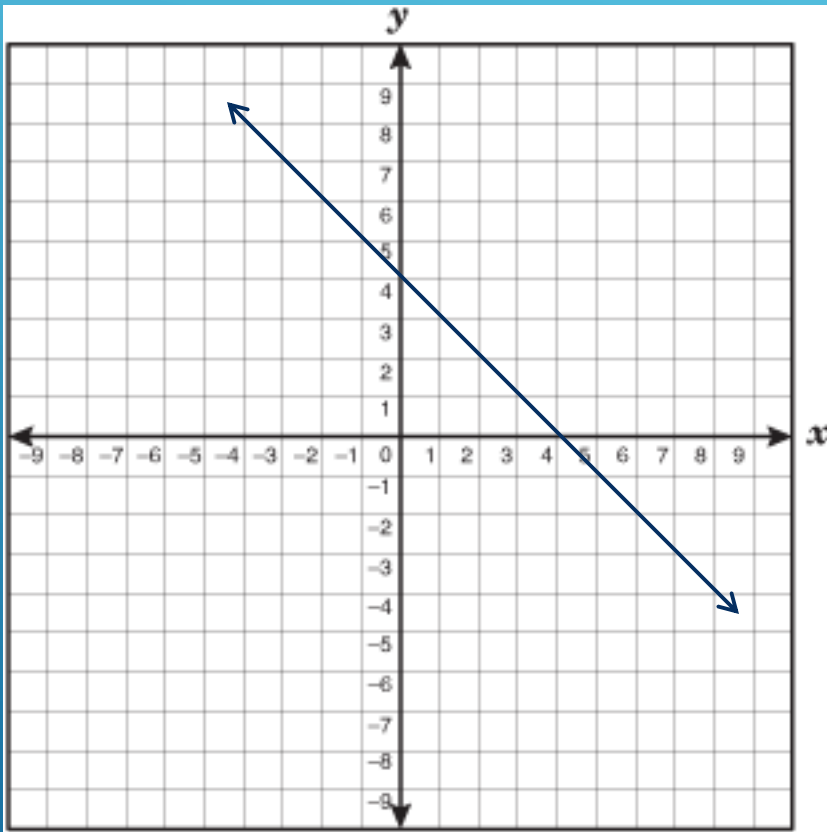
$$y + 2 = -\frac{4}{5}(x - 4)$$

# GRAPHING LINES IN POINT-SLOPE FORM



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

DOES YOUR GRAPH LOOK LIKE THIS?



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

## EXAMPLE

- Write an equation in point-slope form for the line that passes through  $(-2, 1)$  with a slope of  $-6$

$$y - 1 = -6(x - -2)$$

$$y - 1 = -6(x + 2)$$

# WRITING EQUATIONS IN POINT-SLOPE FORM

( 8, -4) and a slope of  $\frac{2}{3}$

A series of four parallel white lines of varying lengths, slanted upwards from left to right, located in the bottom right corner of the slide.

# HOW DID YOU DO?

( 8, -4) and a slope of  $\frac{2}{3}$

$$\text{▶ } y + 4 = \frac{2}{3} (x - 8)$$



# WRITING EQUATIONS IN POINT-SLOPE FORM

$(-3, 6)$  and a slope of  $-5$





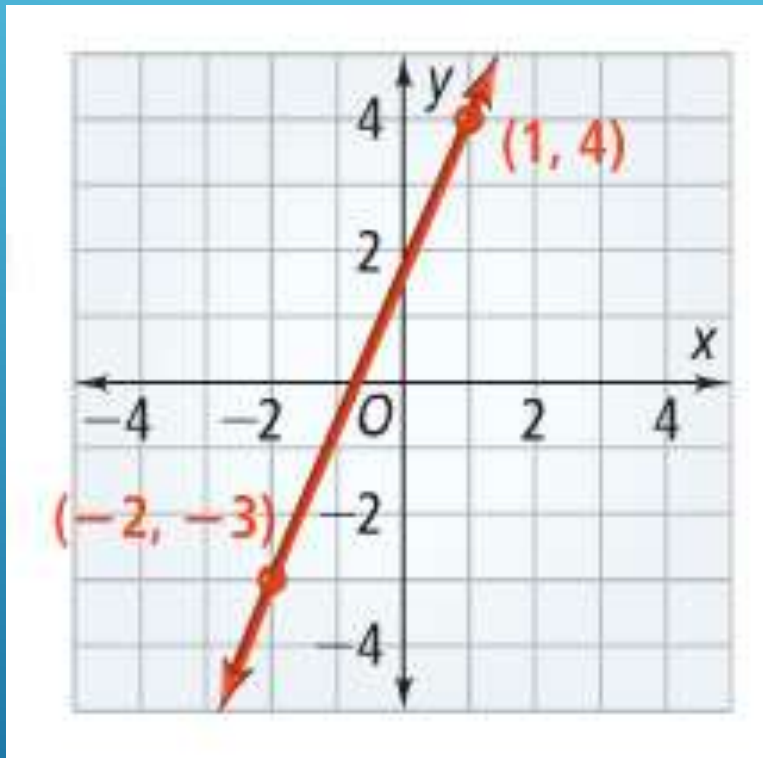
WERE YOU RIGHT?

$(-3, 6)$  and a slope of  $-5$

$$y - 6 = -5(x + 3)$$

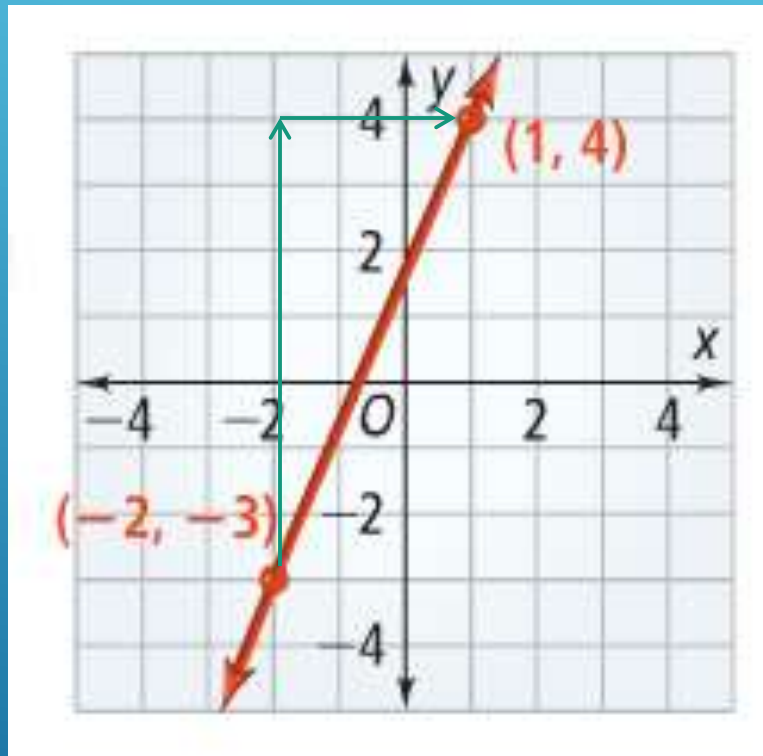


# WRITING EQUATIONS IN POINT-SLOPE FORM WHEN GIVEN 2 POINTS



1. Use the 2 points to find slope ( $m$ )
2. Choose one of the points for  $(x_1, y_1)$

# HOW DID YOU DO?



$$m = \frac{7}{3}$$

$$y - 4 = \frac{7}{3}(x - 1)$$

or

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

# WRITING AN EQUATION IN POINT-SLOPE FORM FROM A TABLE

The table shows the altitude of a hot-air balloon during its linear descent. What equation in point-slope form gives the balloon's altitude at any time? What equation in slope-intercept form gives the balloon's altitude at any time? What do the slope and y-intercept represent?

**Hot-Air Balloon Descent**

Time, $x$ (s)	Altitude, $y$ (m)
10	640
30	590
70	490
90	440

