

10/21/19 - Warm Up Problem

Find the slope of a line going through each set of points.

A(2, -4) and B(5, 8)

$$\frac{8 + 4}{5 - 2} = \frac{12}{3}$$

4

C(5, 9) and D(5, -12)

$$\frac{-12 - 9}{5 - 5} = \frac{-21}{0}$$

undefined

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

Section 3.7 - Equations of Lines

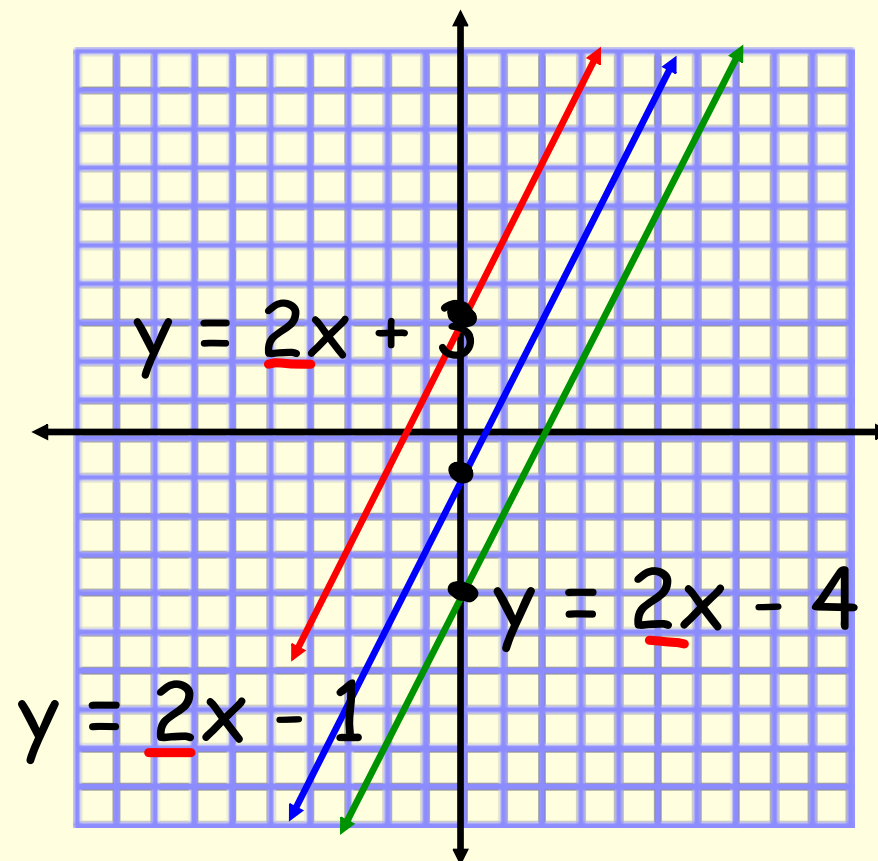
Goal: graph lines and write linear equations

Slope-Intercept Form

$$y = mx + b$$

m = slope

b = y-intercept

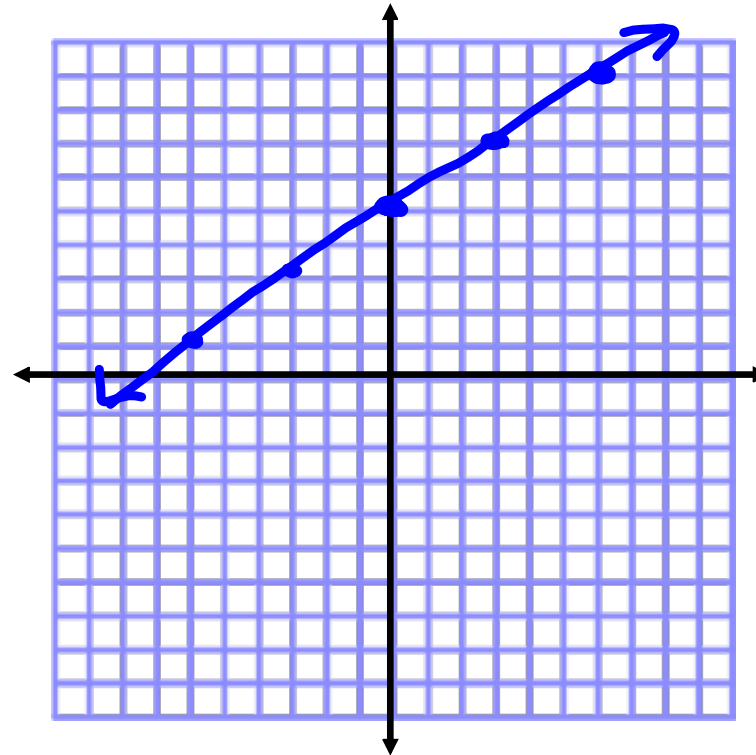


Graphing Linear Equations in Slope-Intercept Form

- Identify the y-intercept and plot on y-axis
- Identify the slope
- Use rise/run to find more points on the line

$$y = \frac{2}{3}x + 5$$

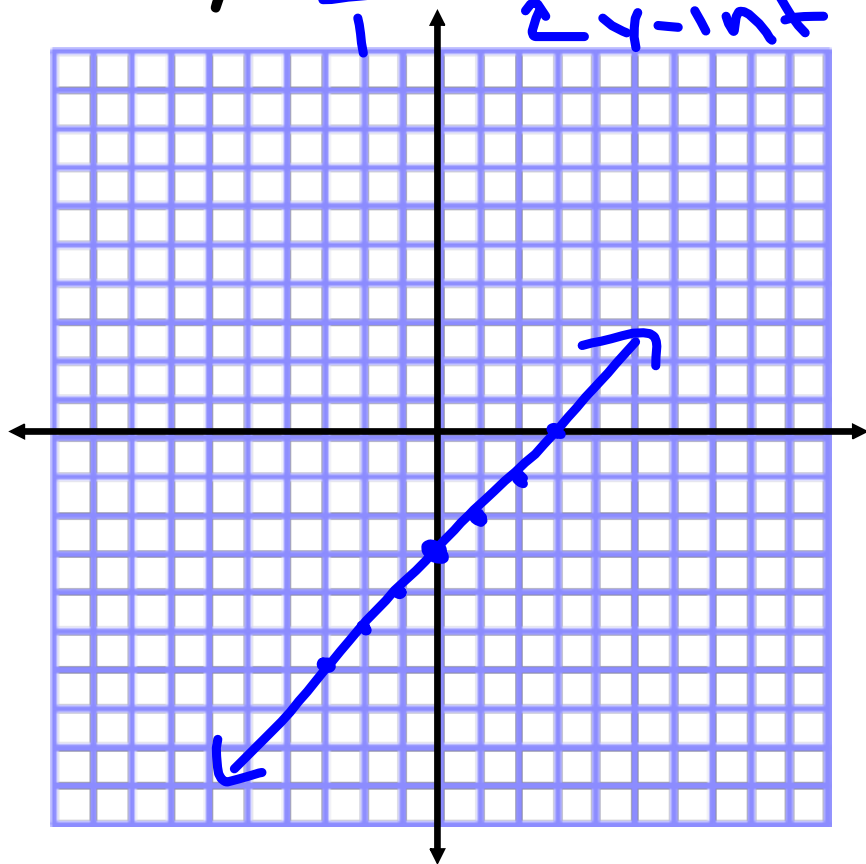
Handwritten annotations in blue ink:
- "rise" above the numerator 2
- "run" below the denominator 3
- "y-int" with an upward arrow pointing to the constant term 5



Graph each equation.

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

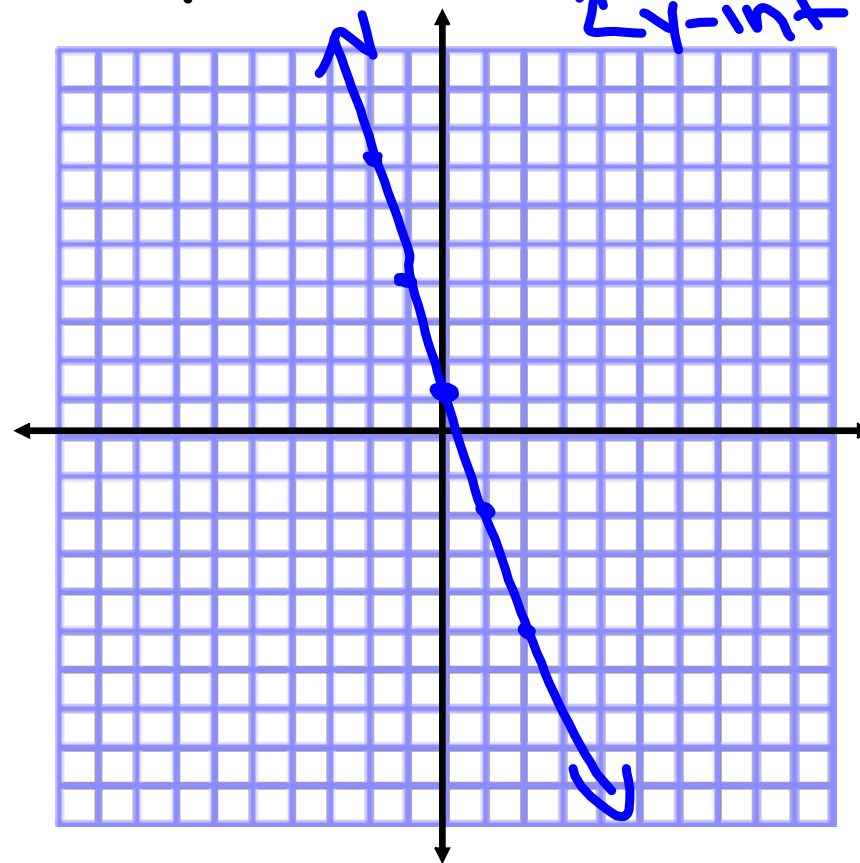
\uparrow \uparrow
x-int y-int



Do this one in your notes.

$$y = -3x + 1$$

\uparrow \uparrow
x-int y-int



Other Forms of Linear Equations

Point-Slope Form

$$y - \underline{y_1} = m(x - \underline{x_1})$$

$m =$ slope

$(x_1, y_1) =$ coordinates of one point
(opposite sign)

$$y - \underline{5} = 2(x - \underline{3})$$

$$m = 2$$

$$(3, 5)$$

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

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

$$(-7, 2)$$

$$y - \underline{-3} = \frac{1}{2}(x - \underline{-6})$$

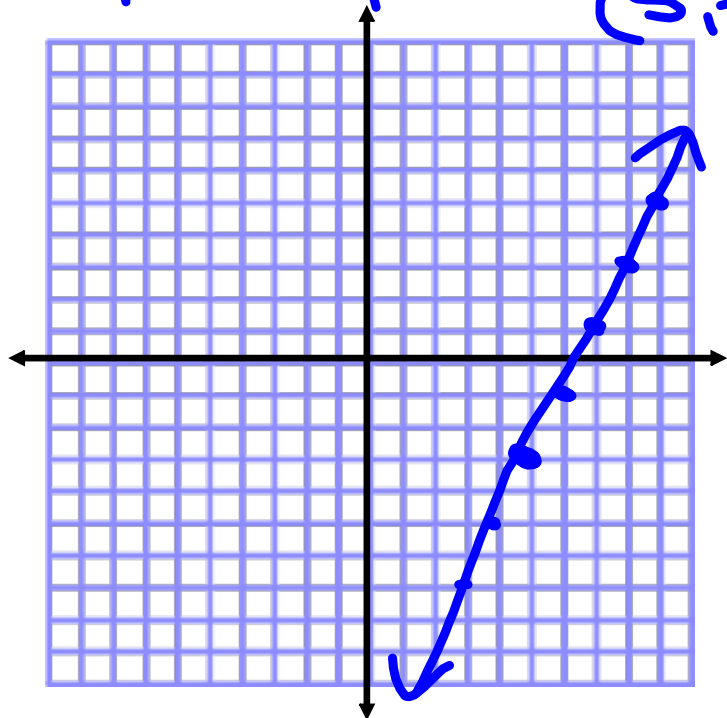
$$m = \frac{1}{2}$$

$$(-6, -3)$$

Graphing in Point-Slope Form

$$y - y_1 = m(x - x_1)$$

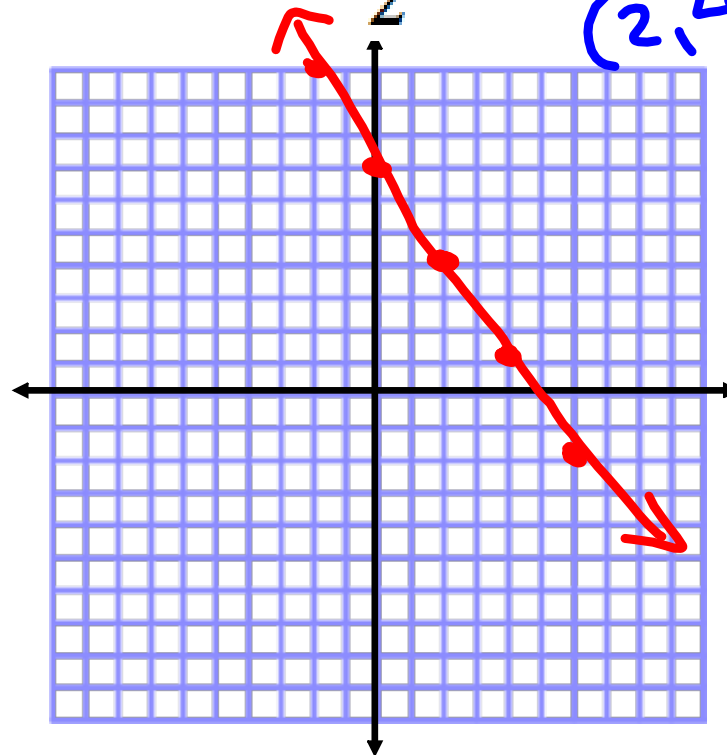
$y_1 = -3$ $x_1 = 5$
 $y + 3 = 2(x - 5)$ $(5, -3)$



Do this one in your notes.

$$y - y_1 = m(x - x_1)$$

$y_1 = 4$ $x_1 = 2$
 $y - 4 = -\frac{3}{2}(x - 2)$ $(2, 4)$



Writing Equations of Lines

Point-Slope Form

$$y - y_1 = m(x - x_1)$$

Slope-Intercept Form

$$y = mx + b$$

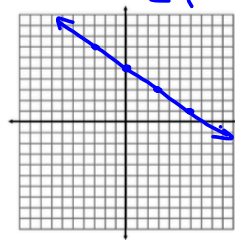
Write the equation of a line that has a slope of $\frac{1}{2}$ and goes through the point $(8, -2)$. Write your final answer in slope-intercept form.

$$\begin{aligned}
 y + 2 &= \frac{1}{2}(x - 8) \\
 y + 2 &= \frac{1}{2}x - 4 \\
 \quad -2 &\quad -2 \\
 \hline
 y &= \frac{1}{2}x - 6
 \end{aligned}$$

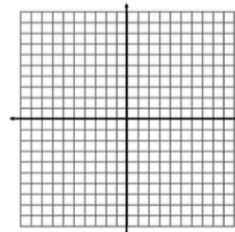
Assignment:
Concept 8 Worksheet
(front)

Graph each equation.

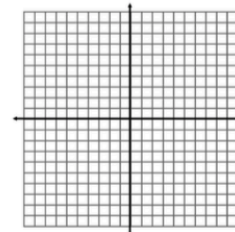
1. $y = -\frac{2}{3}x + 5$ *2 y-int*



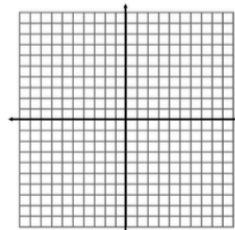
2. $y = \frac{2}{5}x + 0$



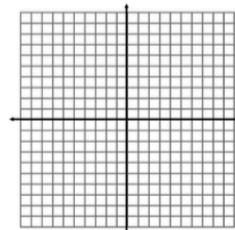
3. $y = -\frac{1}{3}x + 3$



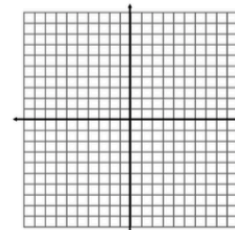
4. $y = x + 2$



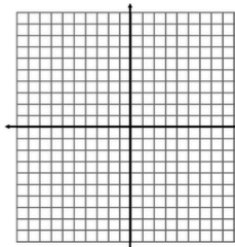
5. $y = -2x + 6$



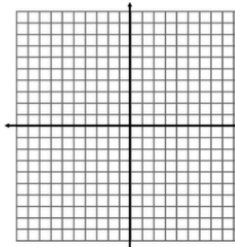
6. $y = -x$



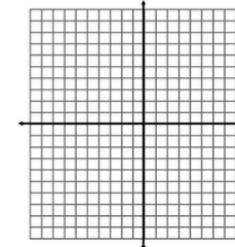
7. $y - 3 = \frac{2}{3}(x + 5)$



8. $y + 6 = 3(x - 2)$



9. $y - 8 = -\frac{4}{3}(x - 2)$



Write the equation of a line that has the given slope and goes through the given point. Put your final answer in slope-intercept form.

10. $m = -2$; point $(-3, 5)$

11. $m = -\frac{2}{3}$; point $(9, 1)$

12. $m = \frac{5}{2}$; point $(-2, 7)$