5.2 - Different Forms of the Equation of a Line

Key Ideas

1. The equation of the line may be in the form Ax + by + C = 0 or Ax + By = C but you can rewrite it to get it into the form y = mx + b; where m = <u>slope</u> and b = <u>y-intercept</u>.

2. You can graph the equation of a line by locating two points. The first point would be the y-intercept and you could find the second point using rise and run of the slope.
   <u>Note</u>: m = $\frac{rise}{run}$, where RISE = **up** if **positive** and **down** if **negative** and RUN = **right** if **positive** and **left** if **negative**.

<u>Example One</u>
Determine the slope and the y-intercept of the lines:

a) 3x + 4y + 8 = 0

y = mx + b

1. Bring "4y" over to the other side.

3x + 8 = -4y

2. Divide both sides by -4.

$$\frac{3x + 8}{-4} = \frac{-4y}{-4}$$

3. $y = \frac{3x}{-4} + \frac{8}{-4}$

$y = \frac{-3x}{4} - 2$

Slope: $-\frac{3}{4}$

Y-intercept: -2

b) 8x + 5y = 0

1. Bring "5y" over to other side.

8x = -5y

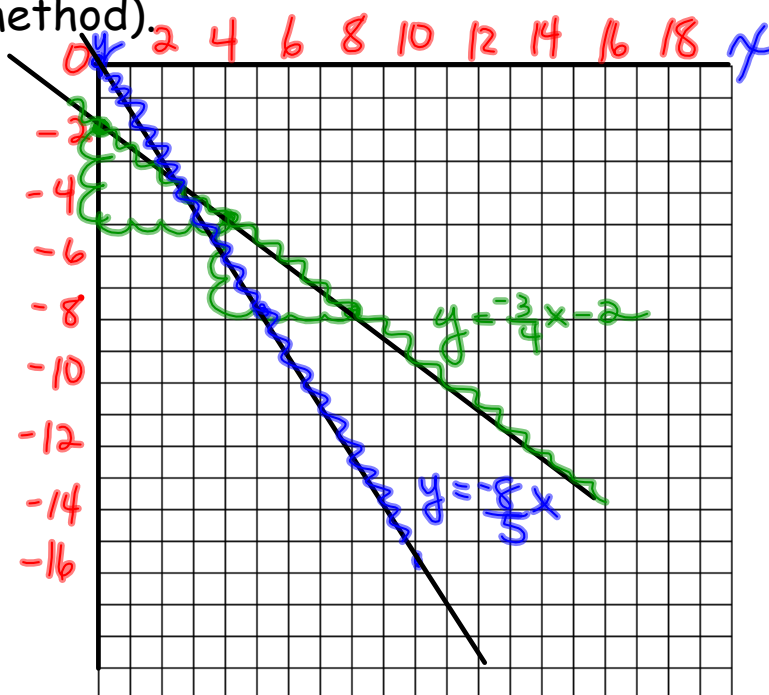2. Divide both sides by -5.

$$\frac{8x}{-5} = \frac{-5y}{-5}$$

3. $y = \frac{8x}{-5}$ or $y = \frac{-8x}{5}$

Slope: $-\frac{8}{5}$

Y-intercept: 0

Example Two

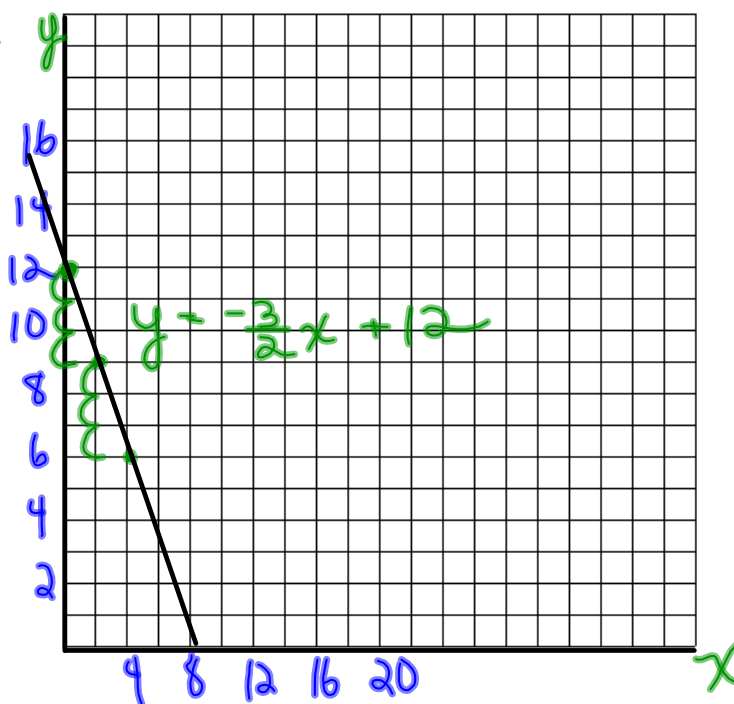Graph the lines in <u>Example One</u> using the y-intercept and slope (rise over run method).

On the graph: $y = \frac{-3}{4}x - 2$ and $y = \frac{-8}{5}x$

Example Three

Graph the line y = $\dfrac{-3}{2}x + 12$ using the y-intercept and slope (rise over run method).

Slope: $-\frac{3}{2}$

Y-intercept: 12

On the graph: $y = \frac{-3}{2}x + 12$

Complete: p. 269 - 270 #3abdf, 4abdf, 5a, 8.