

My child completed the study guide.

Parent Signature: _____

My child used the links on the teacher website to practice for at least 20 minutes.

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Pre-Algebra Linear Equations Study Guide

1. What is Slope?

a. Steepness of a line

b. Formula:

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

2. What are the 4 types of slope? (Draw each one out)

a. Positive \nearrow

b. Negative \searrow

c. Zero ---

d. Undefined +

3. What are two ways you can find slope?

a. triangle method

b. slope formula

4. What are the two different forms for equations of lines?

a. Standard

b. Slope-intercept

5. What is a proportional relationship (otherwise known as direct variation)?

a. When an equation can be written as $y = \text{number}(\text{multiplied by } x)$

b. The graph goes through the origin

6. Slope Intercept Form ($y=mx+b$)

a. Slope = m

b. Y-intercept = b

Examples:

$$y = 3x + 2$$

3 is circled and labeled m . 2 is circled and labeled $y\text{-int}$.

$$y = -\frac{1}{2}x - 4$$

$-\frac{1}{2}$ is circled and labeled m . -4 is circled and labeled $y\text{-int}$.

$$y = -\frac{1}{4}x - 6$$

$-\frac{1}{4}$ is circled and labeled m . -6 is circled and labeled $y\text{-int}$.

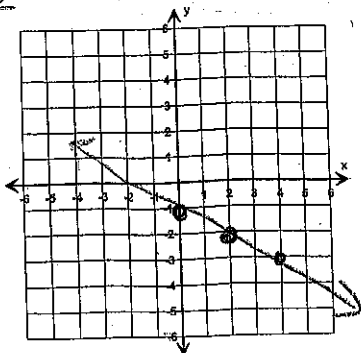
c. Graphing Slope Intercept Form

i. Plot y-intercept (0, number)

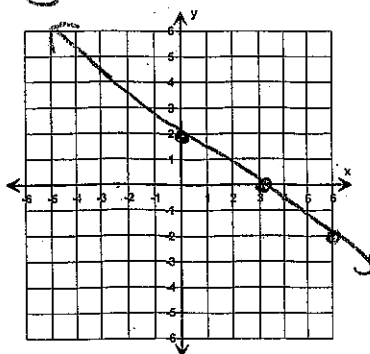
ii. Use slope to plot next few points

Examples:

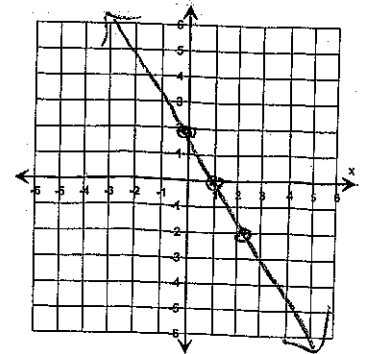
$$y = -\frac{1}{2}x - 1$$



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



$$y = -2x + 2$$



7. Standard Form ($Ax + By = C$ $2x + 3y = 6$)

a. Solve for y to convert to ~~standard~~ ^{slope-int} form

Examples:

$$3x - y = 6$$

$$\begin{array}{r} 3x - y = 6 \\ -3x \quad -3x \\ \hline -y = -3x + 6 \\ \hline y = 3x - 6 \end{array}$$

$$2x + 4y = 8$$

$$\begin{array}{r} 2x + 4y = 8 \\ -2x \quad -2x \\ \hline 4y = -2x + 8 \\ \hline y = -\frac{1}{2}x + 2 \end{array}$$

$$\begin{array}{r} 6x + 6y = 12 \\ -6x \quad -6x \\ \hline 6y = -6x + 12 \\ \hline y = -x + 2 \end{array}$$

$$y = -x + 2$$

$$y = 3x - 6$$

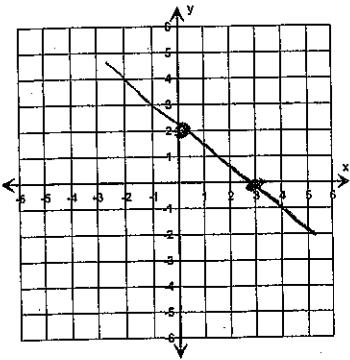
b. Use cover up method to find x and y-intercepts to graph

- Cover up opposite letter to find each intercept
- Plot those points then draw your line

y-int (0, 2)
x-int (2, 0)

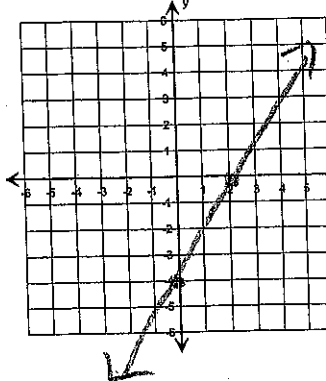
Examples:

$$2x + 3y = 6$$



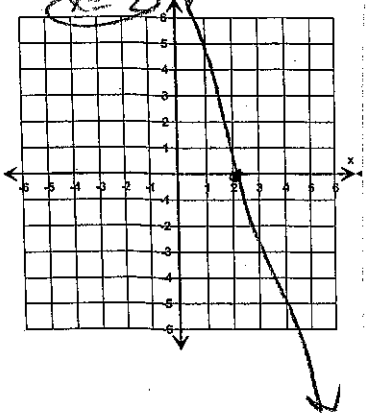
$$\begin{array}{l} \text{x-int} \\ 2x = 6 \\ x = 3 \\ (3, 0) \\ \text{y-int} \\ 3y = 6 \\ y = 2 \\ (0, 2) \end{array}$$

$$4x - 2y = 8$$



$$\begin{array}{l} \text{x-int} \\ 4x = 8 \\ x = 2 \\ (2, 0) \\ \text{y-int} \\ -2y = 8 \\ y = -4 \\ (0, -4) \end{array}$$

$$5x + y = 10$$



8. Parallel and Perpendicular Lines

a. Parallel lines have the same slope

i. Examples:

$$\left. \begin{array}{l} y = 2x \\ y = 2x + 1 \end{array} \right\} \begin{array}{l} y = -\frac{1}{2}x \\ y = -\frac{1}{2}x + 1 \end{array}$$

b. Perpendicular lines have the opposite reciprocal slope

i. Examples:

$$\left. \begin{array}{l} y = 2x \\ y = -\frac{1}{2}x \end{array} \right\} \begin{array}{l} y = -3x \\ y = \frac{1}{3}x \end{array}$$