

RH Extra Practice (Linear Equations)

What should I know up until this point?



I. There are three ways to graph a linear equation

- Creating a table of x and y values
- Intercept method (finding the x and y -intercepts)
- Slope-Intercept method " $y = mx + b$ ", where m represents the slope and b represents the y -intercept.

Examples:

1. Graph $y - 3 = \frac{2}{3}x$ using a table of values.
 2. Graph $y + x - 4 = 0$ using the intercept method.
 3. Graph $x = 2y + 10$ using the slope-intercept method.
-

II. A line is a picture of all solutions to the equation

- Determine if an ordered pair (point) is a solution to a given equation

Example:

4. Is $(-60, 45)$ a solution to $2x + 3y = 15$
-

III. Graphing and recognizing the equation of *Horizontal* and *Vertical* Lines

- $y = b$, where b is any number, is the equation of a horizontal line
- $x = a$, where a is any number, is the equation of a vertical line

Example:

5. On the same set of axes, graph the lines $y = -2$ and $x = 5$. What is their point of intersection?

IV. Slope (determines the steepness and direction of a line)

- Given a graph, find the slope of a line using $\frac{\text{rise}}{\text{run}}$
- Given two points on a line, find the slope of a line using the slope formula ($m = \frac{y_2 - y_1}{x_2 - x_1}$)
- Given an equation, find the slope (m in $y = mx + b$)

Examples:

6. Using a graph, find the slope of a line that passes through the points (-3, -4) and (3, 0).
7. Using the slope formula, find the slope of a line that passes through the points (-2, 4) and (2, 1).
8. Find the value of y so that the line passing through the two points has the given slope.

$$(2, y), (4, 5), m = 2$$

9. Without graphing the line, determine the slope of $3x - 6y = 9$
-

V. Lines (general understanding)

- Sketching graphs of lines (no graph paper!)
- Determine if lines will be parallel, intersecting or perpendicular

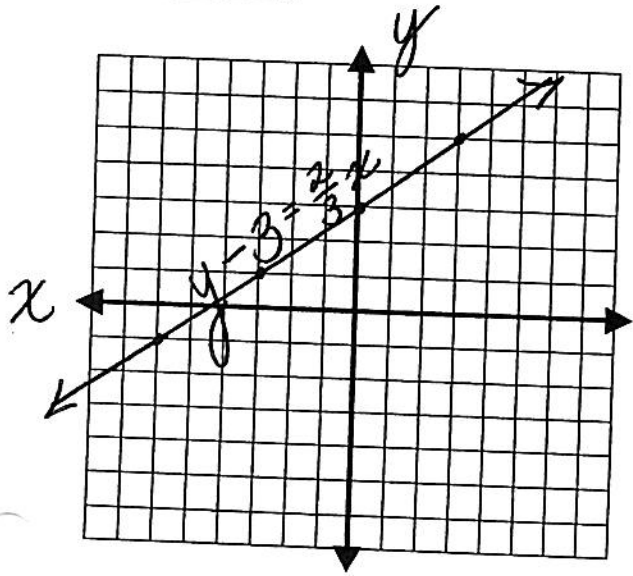
Examples:

10. **T/F** A line that passes through quadrants I and II only will not intersect the x -axis.
11. Sketch the graph of $x = -3$.
12. Sketch the graph of $4x + 4y = -12$
13. Write an equation of a line that is parallel to $y = 2x + 5$.
14. Write an equation of a line that is perpendicular to $y - 3x = 1$.
15. Without graphing, determine if $y = \frac{1}{4}x + 3$ and $y = -3x - 5$ will intersect? Explain your reasoning.

Extra Practice Answer Key

1. $y = \frac{2}{3}x + 3$

x	y
6	7
3	5
0	3
-3	1
-6	-1



2. $y + x - 4 = 0$

$y + x - 4 = 0$

$0 + x - 4 = 0$

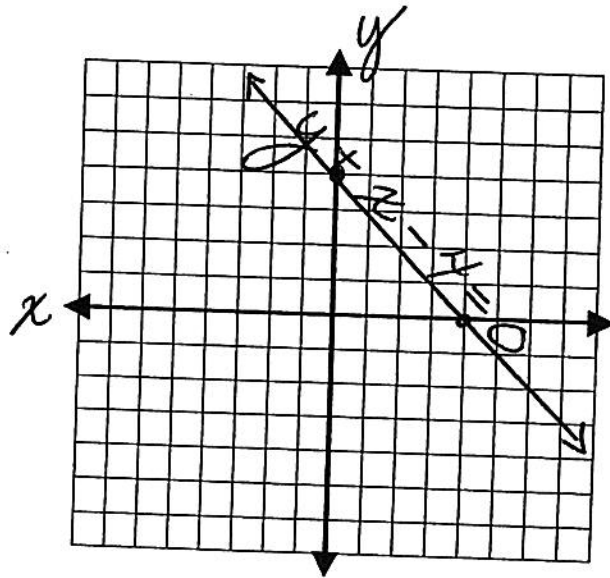
$y + 0 - 4 = 0$

$x = 4$

$y = 4$

x-int: (4,0)

y-int: (0,4)

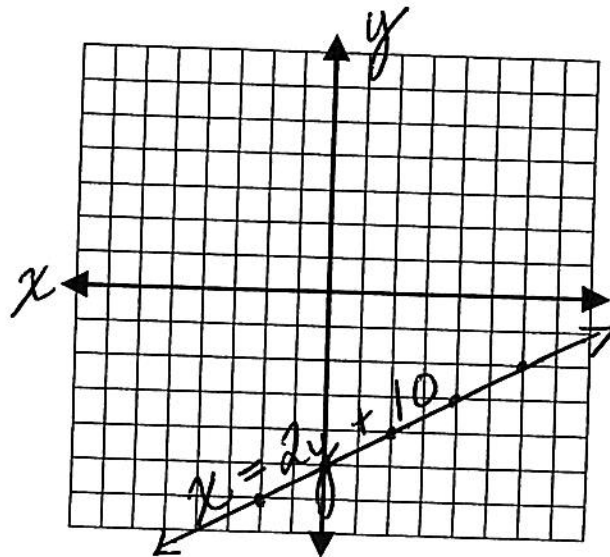


3. $x = 2y + 10$

$x - 10 = 2y$

$\frac{1}{2}x - 5 = y$

$y = \frac{1}{2}x - 5, m = \frac{1}{2}, b = -5 (0, -5)$



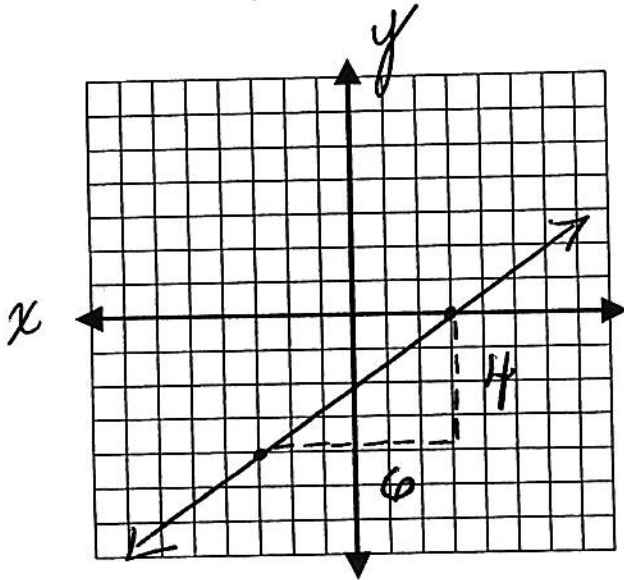
4. $2x + 3y = 15$

$2(-60) + 3(45) = 15$

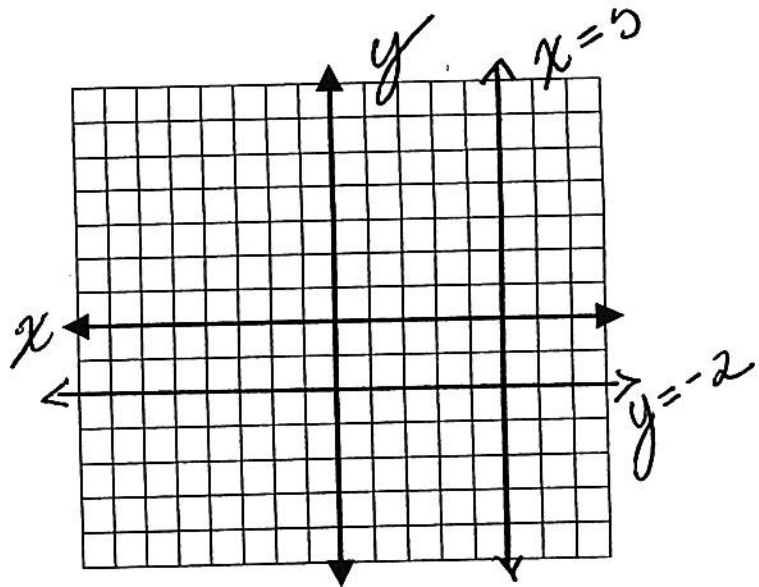
$-120 + 135 = 15$

$15 = 15$ yes, it is a solution

6. slope = $\frac{2}{3}$



5.



Point of intersection

(5, -2)

7. $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 4}{2 - (-2)} = \frac{-3}{4}$

8. $2 = \frac{5 - y}{4 - 2}$

$\frac{2}{1} = \frac{5 - y}{2}$

$5 - y = 4$

$-y = -1$

$y = 1$

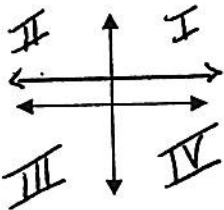
9. $3x - 6y = 9$

$-6y = -3x + 9$

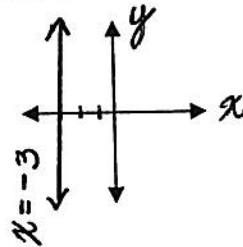
$y = \frac{1}{2}x - 1.5$

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

10. True



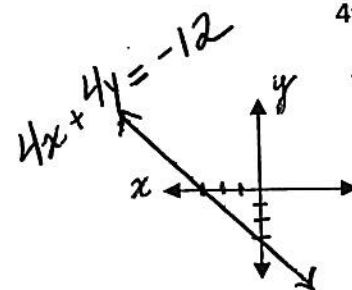
11. Sketches do not require graph paper!



12. $4x + 4y = -12$

$4y = -4x - 12$

$y = -x - 3$



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

$b = (0, -3)$

13. $y = 2x - 1$

Any line that has a slope of 2 and does not have a y-int. of 5.

14. $y - 3x = 1 \rightarrow y = 3x + 1$

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

Any line that has a slope of $-\frac{1}{3}$

15. Yes, the lines will intersect. The slopes are not the same, therefore the lines are not parallel.