

Summative Assessment Review Day 3 (Units 5 & 6 - Chapters 6 & 7)

© Analyzing Linear Relations (chapter 6 in text)

- > Equations of Lines in slope/y-intercept form
 $y = mx + b$, where m is the slope, b is the y-intercept (where the graph crosses the y-axis - the point where x is 0)
- > Equations of Lines in standard form
 $Ax + By + C = 0$, leading coefficient must be positive, no fractions, no decimals, = 0 on the right side
- > Horizontal/Vertical Lines
- > Graphing using intercepts
- > Parallel Lines (parallel lines have the same slope)
- > Perpendicular Lines (slopes are negative reciprocals)
- > Finding Equation of Line given a point and slope
- > Finding Equation of Line given two points
- > Linear Systems (Finding point of intersection of two lines)

Example 1: Graph the line $y = -3x - 2$ using the slope and y-intercept.

$y = mx + b$
 slope $m = -\frac{3}{1}$ y-intercept $b = -2$

Example 2: Write the equation $2x - 4y = 10$ in slope/y-intercept form ($y = mx + b$ form)

$$\begin{aligned} 2x - 4y &= 10 - 2x \\ -4y &= -2x + 10 \\ \frac{-4y}{-4} &= \frac{-2x + 10}{-4} \\ y &= \frac{-2}{-4}x + \frac{10}{-4} \\ y &= \frac{1}{2}x - \frac{5}{2} \end{aligned}$$

$-\frac{1}{2}x + y + \frac{5}{2} = 0$

Example 3: Write $y = -3x + 2$ in standard form

$$+3x + y - 2 = 0$$

Example 4: The equations of four lines are given:

$y = 2x - 4$ $y = 5$ $y = -x + 3$ $x = -3$

Which of these represents

(a) a vertical line? $x = -3$

(b) a horizontal line? $y = 5$

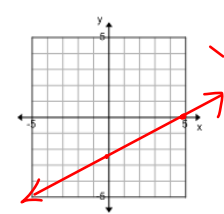
(c) a line that slopes upward to the right? $y = 2x - 4$

(d) a line that slopes downward to the right? $y = -x + 3$

Explain each choice.

Example 5: Graph $2x - 4y = 10$ using intercepts.
 To find the x-intercept, set $y = 0$
 To find the y-intercept, set $x = 0$
 Be sure to extend the line to fill your grid and label the line. Ensure that you have included a scale, you've labeled the axes and included arrows on the line and on the axes.

x-intercept y-intercept

$$\begin{aligned} 2x - 4(0) &= 10 & 2(0) - 4y &= 10 \\ \frac{2x}{2} &= \frac{10}{2} & -4y &= 10 \\ x &= 5 & \frac{-4y}{-4} &= \frac{10}{-4} \\ (5, 0) & & y &= -2.5 \\ & & (0, -2.5) & \end{aligned}$$


Example 6: What is the equation of a line...

(a) With y-intercept 3 and perpendicular to a line with slope $\frac{1}{2}$.

$m = -\frac{2}{1}$ $b = 3$ $y = -2x + 3$

(b) Parallel to the line $x = 2$ and passing through the point (5, 7) $x = 5$

(c) through (-4, -1) with slope $\frac{1}{2}$. See next page

(d) With an x-intercept of 6 and a y-intercept of 4
To write the equation of a line we need the slope and the y-intercept. We need to use the two points (6, 0) and (0, 4) to find the slope. See next page

$m = 1$
 $b = 8$

$m = \frac{3-7}{-5-(-1)}$
 $m = \frac{-4}{-4}$
 $m = 1$

$y = mx + b$
 $3 = 1(-5) + b$
 $3 = -5 + b$
 $8 = b$

$y = 1x + 8$

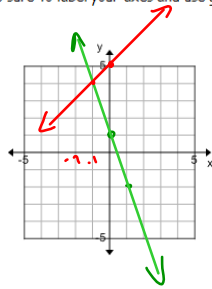
Example 7: Find the point of intersection of the two lines by graphing. Check your answer using

good Math form.

$y = -3x + 1$

$y = x + 5$

(Be sure to label your axes and use good graphing form)



POI
 $(-1, 4)$

LS	RS
y	$-3x + 1$
4	$-3(-1) + 1$
	4

(c) through $(-4, -1)$ and a slope of $\frac{1}{2}$ m

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

$y = mx + b$
 $-1 = \frac{1}{2}(-4) + b$

y intercept $x = 0$
 $(0, b)$

$-1 = -2 + b$
 $-1 = -2 + b$
 $1 = b$

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

D) $(6, 0)$ $(0, 4)$
 x_1, y_1 x_2, y_2

$m = -\frac{2}{3}$
 $b = 4$

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{4 - 0}{0 - 6}$

$m = \frac{4}{-6}$

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

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