Linear Functions Review

Name: Key

1. What is the slope of the line with an x-intercept of -3 and a y-intercept of 6?

(-3,0) x_1, y_1 (0,6) x_2, y_2

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6-0}{0-(-3)} = 2$

2. Write the equation $2x + 7y - 14 = 0$ in slope-intercept form.

$7y = -2x + 14$

$y = -\frac{2}{7}x + 2$

3. Write the equation $y = \frac{2}{3}x - 8$ in general form.

$3y = 2x - 24$

$2x - 3y - 24 = 0$

4. Write the equation of the line through the given points in slope-point form: $(8, -3), (4, -6)$.

x_1, y_1, x_2, y_2

$m = \frac{-6-(-3)}{4-8} = \frac{3}{4}$ $\quad y + 3 = \frac{3}{4}(x - 8)$

or $y + 6 = \frac{3}{4}(x - 4)$

5. What is the slope and y-intercept of the line given by the equation $y - 3 = -\frac{1}{2}(x + 8)$.

$m = -\frac{1}{2}$ slope-point form.

y-intercept $\Rightarrow x = 0$: $y - 3 = -\frac{1}{2}(0 + 8)$

$y - 3 = -4$, $y = -1$.

6. What is the equation of the line which passes through the point $(0, -1)$ and is perpendicular to $3x - 6y + 1 = 0$?

$6y = 3x + 1$

$y = \frac{1}{2}x + \frac{1}{6}$

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

slope of perpendicular line: $m = -2$

passes through $(0, -1)$ $\Rightarrow$ y-intercept of -1

$y = -2x - 1$

7. If two lines with slopes of $\frac{6}{n}$ and $-\frac{3}{2}$ are parallel, what is the value of n?

parallel lines, equal slopes:

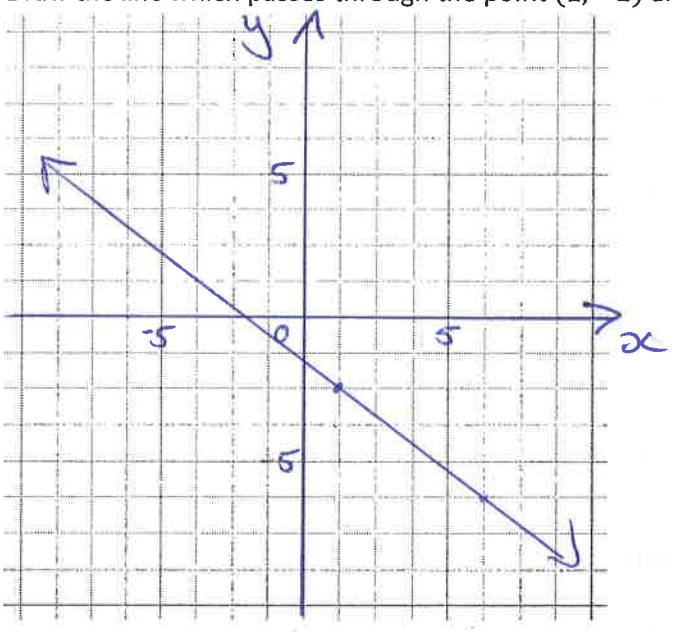
$\frac{6}{n} = -\frac{3}{2} \Rightarrow -3n = 12$

$n = -4$

8. If line A has a slope of 0.4 and line B has a slope of $\frac{2}{5}$ what do you know about the lines?

$0.4 = \frac{4}{10} = \frac{2}{5}$ parallel

9. Draw the line which passes through the point $(1, -2)$ and has a slope of $-\frac{3}{4}$.



10. Determine the slope of the line passing through the points:

a. $(0, 5)$ *and* $(-3, 2)$

$x_1\ y_1 \quad x_2\ y_2$

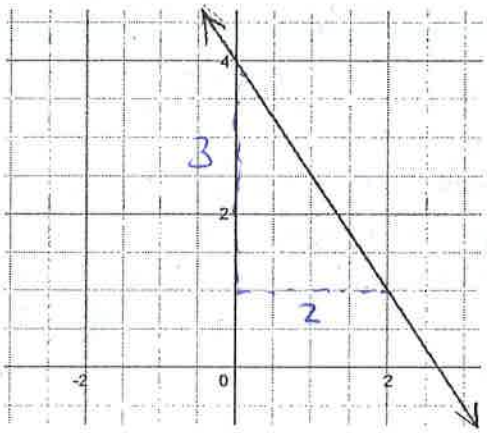
$m = \frac{2-5}{-3-0} = \frac{-3}{-3} = 1$

b. $(-2, -3)$ *and* $(-6, -11)$

$x_1\ y_1 \quad x_2\ y_2$

$m = \frac{-11-(-3)}{-6-(-2)} = \frac{-8}{-4} = 2$

11. What is the equation of the line shown below?



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

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

12. What is the equation of a line parallel to $y = -3x + 2$ that has the same x-intercept as $y = 2x + 4$?

$m = -3$

$\Rightarrow y = 0$

$0 = 2x + 4$

$2x = -4$

$x = -2$

The parallel line must have slope -3 and pass through $(-2, 0)$:

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

$y = -3x - 6$

BONUS

13. A linear relation which is not a function would produce what type of graph?

Vertical line.

Equation cannot be written in the form $y = mx + b$ as m is undefined.