

Handout 1.2: Linear Functions and Slope-Intercept Form

Name: Key

Date: _____

Per: _____

Find the slope of the line through each pair of points.

1) $(-3, -2)$ and $(1, 6)$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - (-2)}{1 - (-3)} = \frac{6 + 2}{1 + 3} = \frac{8}{4} = 2$

$m = 2$

2) $(\frac{1}{2}, \frac{2}{3})$ and $(\frac{3}{2}, \frac{5}{3})$

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

$m = 1$

Find the slope and y-intercept of each line.

3) $y = -2 \rightarrow y = 0x - 2$

$m = 0$

4) $x = 5$

Undefined

5) $3x - 4y = 12$

$-4y = -3x + 12$

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

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

6)

$m = \frac{\text{rise}}{\text{run}} = \frac{4}{-1} = -4$

$b = 2$

7) $f(x) = \frac{5}{4}x + 7$

$m = \frac{5}{4}$

$b = 7$

8) A) The equation $e = 1200 + 11t$ represents your elevation, e , in feet for each minute t you hike from a trail head. What does the slope represent in this situation? **Explain.**

The slope of 11 means you hike 11 feet per minute.

B) Are you hiking uphill or downhill? **Explain.**

You are hiking uphill because your slope is positive.

9) What is the slope of a vertical line? **Explain.**

The slope of a vertical line is undefined. This is because slope is rise divided by run, the "run" of a vertical line is zero and you cannot divide by zero.

$$y = mx + b$$

Write an equation for each line in slope-intercept form.

10) $m = -4$ and y -
 $int = 3$

$$y = -4x + 3$$

11) $-3x + 2y = 7$
 $+3x$ $+3x$

$$\frac{2y}{2} = \frac{3x + 7}{2}$$

$$y = \frac{3}{2}x + \frac{7}{2}$$

12) $-\frac{1}{2}x - y = 12$
 $+\frac{1}{2}x$ $+\frac{1}{2}x$

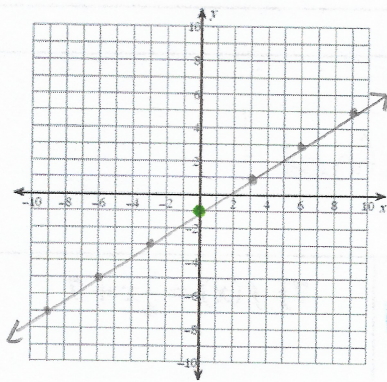
$$-1(-y) = \left(\frac{1}{2}x + 12\right) - 1$$

$$y = -\frac{1}{2}x - 12$$

Graph each equation.

13) $y = \frac{2}{3}x - 1$

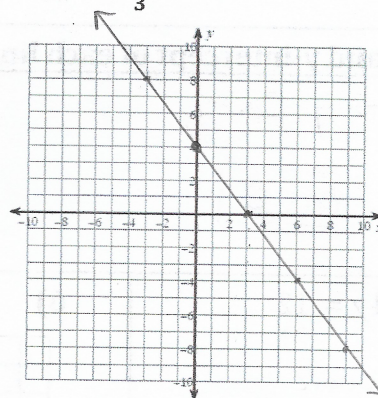
y -int = -1



rise = 2
run = 3

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

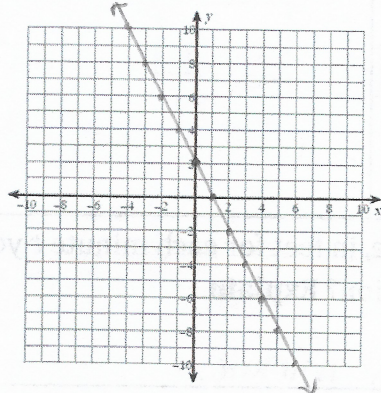
y -int = 4



rise = -4
run = 3

15) $y = -2x + 2$

y -int = 2



rise = -2
run = 1

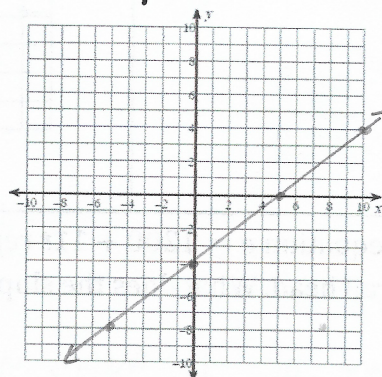
16) $4x - 5y = 20$

$$4x - 5y = 20$$

$$-4x \quad -4x$$

$$-5y = -4x + 20$$

$$-5 \quad -5$$



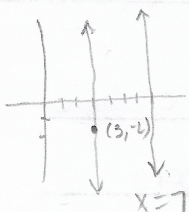
$$y = \frac{4}{5}x - 4$$

y -int = -4

rise = 4
run = 5

Write an equation in slope-intercept form for the line that satisfies each set of conditions.

17) Passes through $(3, -2)$ and parallel to
 $x = 7$



$$x = 3$$

18) Parallel to $y = -x + 3$ with a y -intercept
of 5.

$$y = -x + 5$$

19) Passes through (0,10) and perpendicular to $2x - 3y = -3$

↖ y-intercept

$$\begin{array}{r} -2x \qquad -2x \\ -3y = -2x - 3 \\ -3 \qquad -3 \\ \hline y = \frac{2}{3}x + 1 \end{array}$$

$$y = -\frac{3}{2}x + 10$$

20) Passes through $(-6, -6)$, parallel to $y = \frac{4}{3}x + 8$

$$y = \frac{4}{3}x + b$$
$$-6 = \frac{4}{3}(-6) + b$$
$$-6 = -\frac{24}{3} + b$$
$$-6 = -8 + b$$
$$+8 \quad +8$$
$$2 = b$$

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

21) Passes through (4,2), perpendicular to $y = -2x + 3$

$$y = \frac{1}{2}x + b$$
$$2 = \frac{1}{2}(4) + b$$
$$2 = 2 + b$$
$$-2 \quad -2$$
$$b = 0$$

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

22) Passes through $(-7, 5)$ and parallel to $y = 7$
Horizontal line so use y-coordinate

$$y = 5$$

23) Perpendicular to $y = -\frac{1}{2}x + 7$ with a y-intercept of -3 .

$$y = 2x - 3$$

24) Pass through $(2, -5)$ and perpendicular to $y = 5$

To be perpendicular to a horizontal line, line must be vertical; therefore use x-coordinate.

$$x = 2$$