Name _____ Date _____ Class _____

Practice B
2-3 *Graphing Linear Functions*

Determine whether each data set could represent a linear function.
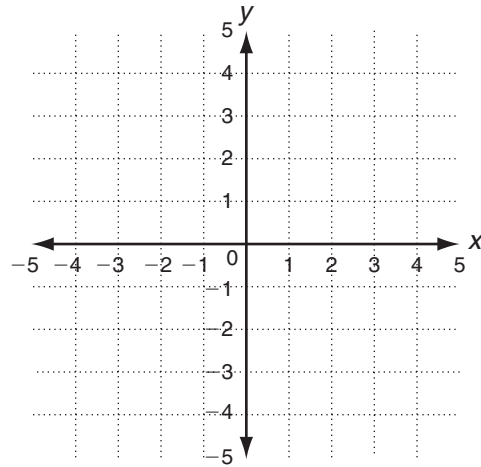
1.

x	9	7	5	3
$f(x)$	2	5	10	15

2.

x	0.5	1	1.5	2
$f(x)$	9	6	3	0

_____   _____

Use the coordinate plane at right to graph and label each line.

3. Line *a* has a slope of -2 and passes through $(1, 4)$.

4. Line *b* has a slope of 1 and passes through $(-4, -2)$.

5. Line *c* has a slope of $\frac{2}{3}$ and passes through $(3, -2)$.

6. Line *d* has a slope of $\frac{-5}{4}$ and passes through $(-1, 0)$.

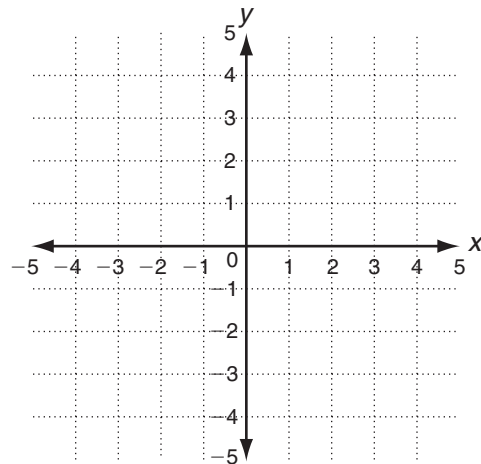**Find the intercepts of each line and graph and label the line.**

7. line *e*: $5x + y = -5$

_____

8. line *f*: $6x + 2y = 6$

_____

Write each function in slope-intercept form. Then graph and label the function.

9. line *g*: $-3x - y = 9$

_____

10. line *h*: $4x + 3y = 6$

_____

Determine whether each line is vertical or horizontal.

11. $x = -5$ **12.** $y = \frac{8}{3}$ **13.** $x = 4.6$

_____   _____   _____

Holt Algebra 2

Practice A
Graphing Linear Functions

Determine if the rate of change, $\dfrac{\text{change in } f(x)}{\text{change in } x}$ is constant. Then tell whether each data set represents a linear or nonlinear function.

1.

		+2	+2	+2	
	+2				

x	1	3	5	7
f(x)	5	10	15	20

+5 +5 +5

linear

2.

	+3	+3	+3

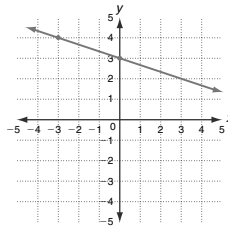| **x**	0	3	6	9
f(x)	1	3	7	10

+2 +4 +3

nonlinear

Plot the given point. Use the slope to find a second point. Then graph the line.

3. point: $(0, -3)$; slope: 2
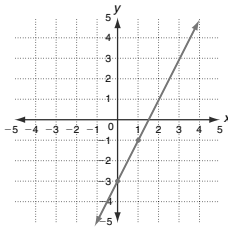
4. point: $(-3, 4)$; slope: $\dfrac{-1}{3}$

Identify the *x*-intercept and the *y*-intercept for each line.

5. $4x + y = 8$

$y = 0; x =$ __**2**__

$x = 0; y =$ __**8**__

6. $3x + 2y = -6$

$y = 0; x =$ __**−2**__

$x = 0; y =$ __**−3**__

7. $2x - 5y = 8$

$y = 0; x =$ __$\dfrac{4}{-8}$__ (over $\dfrac{4}{5}$)

$x = 0; y =$ __$\dfrac{4}{5}$__

Write each function in slope-intercept form, $y = mx + b$.

8. $-5x + y = 7$

$-5x + y + 5x = 7 + 5x$

$y =$ __**5x + 7**__

9. $2y = 4x - 12$

__$y = 2x - 6$__

10. $4x - 3y = -1$

__$y = \dfrac{4x}{3} + \dfrac{1}{3}$__

Holt Algebra 2

Practice B
Graphing Linear Functions

Determine whether each data set could represent a linear function.

1.

x	9	7	5	3
f(x)	2	5	10	15

Nonlinear

2.

x	0.5	1	1.5	2
f(x)	9	6	3	0

Linear

Use the coordinate plane at right to graph and label each line.

3. Line *a* has a slope of -2 and passes through $(1, 4)$.

4. Line *b* has a slope of 1 and passes through $(-4, -2)$.

5. Line *c* has a slope of $\dfrac{2}{3}$ and passes through $(3, -2)$.

6. Line *d* has a slope of $\dfrac{-5}{4}$ and passes through $(-1, 0)$.
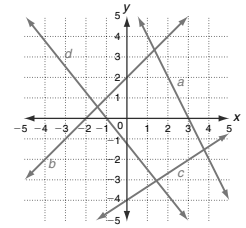
Find the intercepts of each line and graph and label the line.

7. line *e*: $5x + y = -5$

__*x*-intercept $= -1$; *y*-intercept $= -5$__

8. line *f*: $6x + 2y = 6$
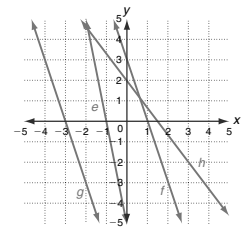
__*x*-intercept $= 1$; *y*-intercept $= 3$__

Write each function in slope-intercept form. Then graph and label the function.

9. line *g*: $-3x - y = 9$

__$y = -3x - 9$__

10. line *h*: $4x + 3y = 6$

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

Determine whether each line is vertical or horizontal.

11. $x = -5$

__**Vertical**__

12. $y = \dfrac{8}{3}$

__**Horizontal**__

13. $x = 4.6$

__**Vertical**__

Holt Algebra 2

Practice C
Graphing Linear Functions

1. Every time Imani buys gas for her car, she records the number of gallons required to fill the tank and the number of miles she has driven since the last fill-up.

Car Mileage Records				
Distance (mi)	250	137	238	356
Gas (gal)	10.2	5.5	9.8	14.2

a. Does the data set represent a linear function? Explain how you know.

No, the data set is nonlinear. Possible answer: The difference between the data items is not consistent or proportional.

b. What does it mean, in terms of the way a car uses gas, for the data to be linear or nonlinear?

Possible answer: It is appropriate for the data to be nonlinear since a car uses gas differently depending on where and how it is being driven.

2. Julian read in a book that he could predict the temperature based on the number of times a cricket chirps per minute. To test this theory, he records cricket chirps and the temperature for several nights.

Cricket Chirps vs. Temperature				
Chirps (per min)	218	198	204	212
Temperature (°F)	93.5	88.5	90	92

a. Does the data that Julian collects represent a linear function? Explain how you know.

Yes, the data set is linear. Possible answer: The difference between ordered pairs is proportional. $\dfrac{20}{5} = \dfrac{6}{1.5} = \dfrac{8}{2}$

b. Julian wrote the equation $T = \dfrac{c}{4} + 39$ to calculate the temperature (T) based on c chirps per minute. Graph the equation on a graphing calculator. Find the c- and T-intercepts.

c-intercept $= -156$; T-intercept $= 39$

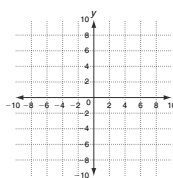**c.** About how many times per minute should a cricket chirp at 76°F?

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3. Graph each equation. Identify the polygon formed by the intersecting lines. Give the coordinates of the vertices of the polygon.

$y = 4$ $\qquad -4x - 2y = -8$

$x + 2y = -4$ $\quad 24 + 3y + 6x = 0$

Trapezoid

$(-6, 4), (0, 4), (-4, 0), (4, -4)$

Holt Algebra 2

Review for Mastery
Graphing Linear Functions

Use intercepts to sketch the graph of the function $3x + 6y = 12$.

The *x*-intercept is where the graph crosses the *x*-axis. To find the *x*-intercept, set $y = 0$ and solve for *x*.

$3x + 6y = 12$
$3x + 6(0) = 12$
$3x = 12$
$x = 4$

> The *x*-intercept occurs at the point $(4, 0)$.

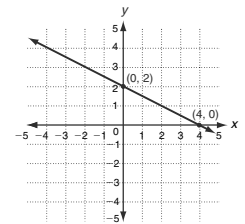The *y*-intercept is where the graph crosses the *y*-axis. To find the *y*-intercept, set $x = 0$ and solve for *y*.

$3x + 6y = 12$
$3(0) + 6y = 12$
$6y = 12$
$y = 2$

> The *y*-intercept occurs at the point $(0, 2)$.

Plot the points $(4, 0)$ and $(0, 2)$. Draw a line connecting the points.

Find the intercepts and graph each line.

1. $3x + 2y = 6$

a. $3x + 2(\underline{\;0\;}) = 6$

x-intercept $=$ __**2**__

b. $3(\underline{\;0\;}) + 2y = 6$

y-intercept $=$ __**3**__

2. $6x - 3y = -12$

a. $6x - 3(\underline{\;0\;}) = -12$

x-intercept $=$ __**−2**__

b. $6(\underline{\;0\;}) - 3y = -12$

y-intercept $=$ __**4**__

Holt Algebra 2