

Alg. 1 Ch. 3 Understand Graphing Linear Functions - Study Guide 3.4 - 3.7

1. I can graph linear functions.

I can graph linear functions using discrete and continuous data. 10,

I can graph equations of horizontal and vertical lines. 11-

I can graph linear equations in standard form using the x- and y-intercepts. 10, 3, 4, 3-

I can find the slope of a line given two points. 2,

I can graph linear equations in slope-intercept form. 5, 6, 12

2. I can write and analyze linear equations that model/fit data. 7, 10, 11

3. I can describe transformations of graphs of linear functions. 8, 9, 17

4. I can graph absolute value functions. 12, 13

I can graph absolute value functions by identifying the vertex and plotting points on either side.

I can graph absolute value functions by identifying the vertex and using the slope of the rays.

I can graph absolute value functions using vertex form and transformations.

5. I can describe transformations of graphs of absolute value functions. 12, 13

1. Consider the parent function $f(x) = |x|$. Which transformations occurred to create $g(x) = -5|x - 3| - 6$?

- a. horizontal translation 3 units right
- b. reflection in the x-axis
- c. vertical stretch by a factor of 5
- d. horizontal stretch by a factor of 5

- e. vertical translation 6 units down
- f. vertical translation 6 units up
- g. reflection in the y-axis
- h. horizontal translation 3 units left

2. You spend \$3.50 on fruit. Apples cost \$0.20 each while oranges cost \$0.30 each. The equation $0.20x + 0.30y = 3.50$ models the situation, where x is the number of apples and y is the number of oranges. Which of the following is not a possible solution in the context of the problem?

- a. 1 apple; 11 oranges ✓
- b. 7 apples; 7 oranges

- c. 11 apples; 1 orange
- d. 4 apples; 9 oranges

a) $.20 + 3.30 = 3.50$

b) $1.40 + 2.10 = 3.50$

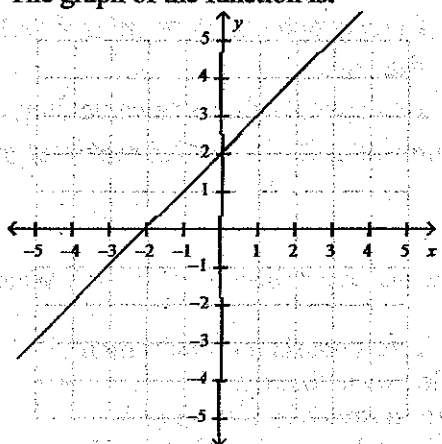
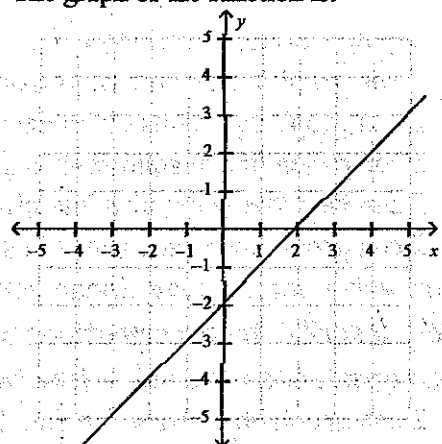
d) $.80 + 2.70 = 3.50$

$$-x = -2 \quad y = -2$$

$$x = 2 \quad (2, 0) \quad (0, -2)$$

3. Which statements are true about the function $-x + y = -2$?

- a. The y-intercept is -2 .
 b. The x-intercept is 2 .
 c. The x-intercept is -2 .
 d. The graph of the function is:
 e. The graph of the function is:
 f. The y-intercept is 2 .



b. The x-intercept is 2 .

c. The x-intercept is -2 .

f. The y-intercept is 2 .

Find and identify the x- and y-intercepts of the graph of the linear equation. List the intercepts as ordered pairs. Be sure to put the equation in standard form if it is not already in that form.

4. $(\frac{1}{2}x + y = -8) \cdot 2$ $x + 2y = -16$ x-int. let $y = 0$
 $x = -16$ $(-16, 0)$

y-int. let $x = 0$
 $2y = -16$
 $y = -8$ $(0, -8)$

5. $-4 - x = 14 - 3y$
 $+3y \quad +3y$
 $-x - 4 + 3y = 14$
 $+4 \quad +4$
 $-x + 3y = 18$

x-int. let $y = 0$
 $-x = 18$
 $x = -18$ $(-18, 0)$

y-int. let $x = 0$
 $3y = 18$
 $y = 6$ $(0, 6)$

The points represented by the table lie on a line. Find the slope of the line using the formula for slope. Be sure I can see your substitution.

6.

x	-5	-3	-1	1
y	7	4	1	-2

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 7}{-3 - (-5)} = \frac{-3}{2}$$

7.

x	2	2	2	2
y	-6	3	-7	1

$$m = \frac{3 - (-6)}{2 - 2} = \frac{9}{0} \text{ undefined slope}$$

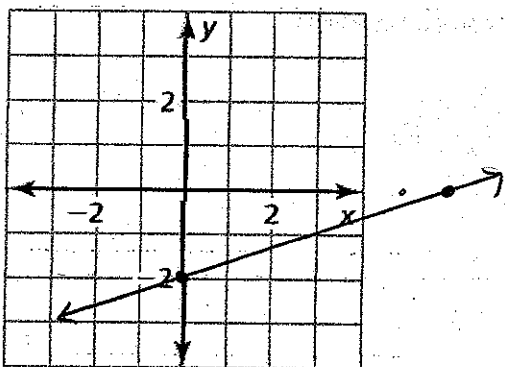
8.

x	1	-4	-3	2
y	3	3	3	3

$$m = \frac{3 - 3}{-4 - 1} = \frac{0}{-5} = 0$$

Graph the linear equation using the requested method.

9. $x - 3y = 6$ by finding and plotting the x- and y- intercept. Be sure to list the intercepts as POINTS.

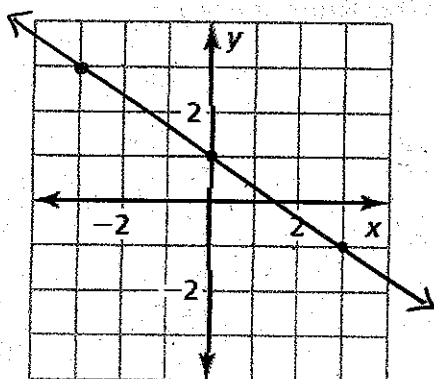


$$x - 3y = 6$$

x-int. let $y = 0$
 $x = 6 \quad (6, 0)$

y-int. let $x = 0$
 $-3y = 6$
 $y = -2 \quad (0, -2)$

10. $y = -\frac{2}{3}x + 1$ Use the slope and y-intercept to graph this line.



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

y-int. $(0, 1)$

11. The function $c = 0.30m + 100$ represents the cost c (in dollars) of renting a car after driving m miles.

a. Identify the independent and dependent variables.

independent variable = miles driven

dependent variable = cost in dollars

b. What would the cost be to rent the car and drive 100 miles?

$$c = .3(100) + 100$$

$$c = 30 + 100$$

$$c = 130$$

It would cost \$130 to drive the car 100 miles.

c. How many miles would a customer have to drive for the cost to be \$149.50?

$$149.5 = .3m + 100$$

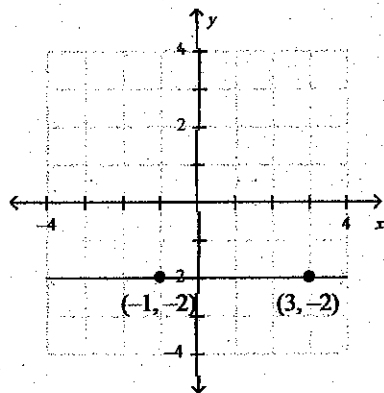
$$49.5 = .3m$$

$$165 = m$$

A customer would have to drive 165 miles for the cost to be \$149.50.

Describe the slope of the line. Then find the slope. No work necessary.

12.



slope = 0

Horizontal line

Identify the slope, y-intercept, and x-intercept of the graph of the linear equation.

13. $5x + 3y = 15$

x-int. let $y = 0$

$$5x = 15$$

$$x = 3$$

(3, 0) x-int.

$$5x + 3y = 15$$

$$-5x \quad -5x$$

$$\frac{3y}{3} = \frac{-5x + 15}{3}$$

$$y = -\frac{5}{3}x + 5$$

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

y-int. (0, 5)

14. $x = -4$

vertical line

x-int. (-4, 0)

no y-intercept

slope is undefined

15. A group spends \$180 for x ski passes and y swim passes at a resort.

Rates	
Ski pass	\$18
Swim pass	\$9

- a. Write an equation in standard form that represents the situation.

$$18x + 9y = 180$$

x = # of ski passes
 y = # of swim passes

- b. Graph the equation and interpret the intercepts. Give your scale!

x-int. let $y=0$

$$\frac{18x}{18} = \frac{180}{18}$$

$$x = 10 \quad (10, 0)$$

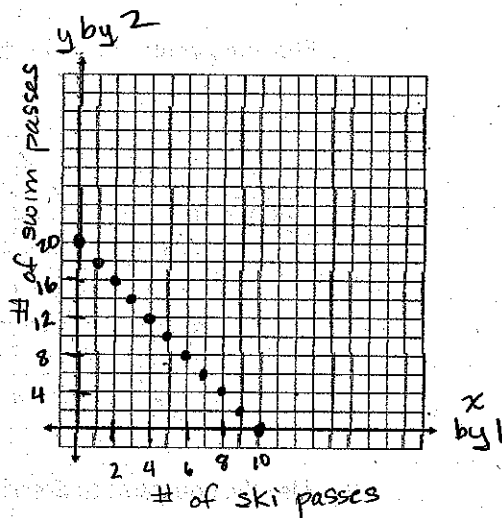
y-int. let $x=0$

$$\frac{9y}{9} = \frac{180}{9}$$

$$y = 20 \quad (0, 20)$$

If the group buys 10 ski passes, they cannot buy any swim passes.

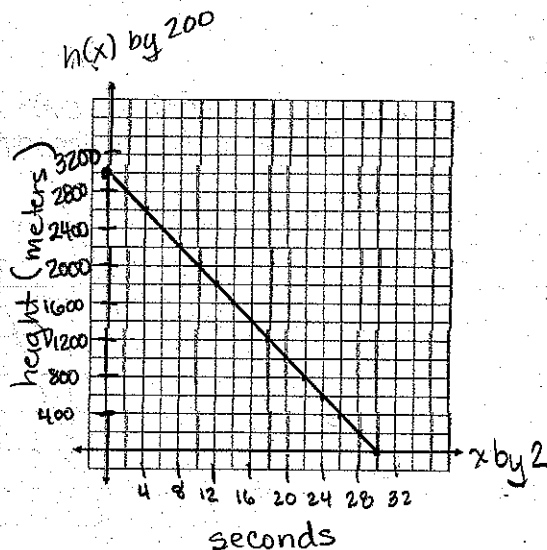
If the group buys 20 swim passes, the group cannot buy any ski passes.



16. A meteor is falling to the ground. The height y (in meters) of the meteor after x seconds is

$$h(x) = -100x + 3000.$$

- a. Graph the function.



- b. Interpret the x -intercept and slope.

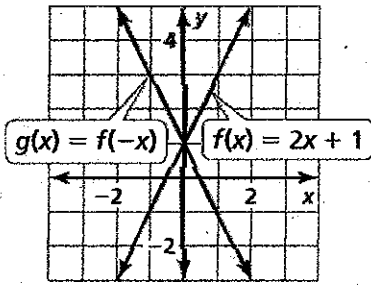
x -int \rightarrow

At time zero, the meteor is 3000 meters above the ground.

The slope means that the meteor is falling towards the earth at 100m/sec.

Use the graphs of f and g to describe the transformation from the graph of f to the graph of g .

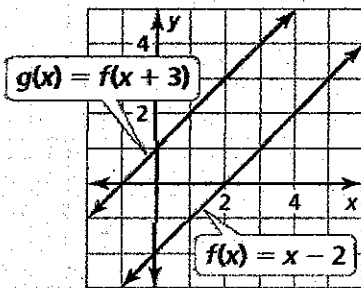
⇒ 17.



$g(x)$ is a reflection over the y -axis.

Use the graph of f and g to describe the transformation from the graph of f to the graph of g .

⇒ 18.

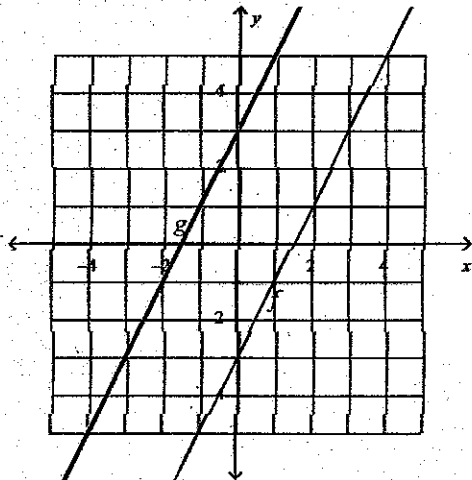


$g(x)$ is a shift left 3 of $f(x)$.

19. Use the equations to describe the transformations from f to g . $f(x) = -x + 5$; $g(x) = 2f(x)$

$g(x)$ is a vertical stretch by a factor of 2 of $f(x)$.

⇒ 20. Let $f(x) = 2x - 3$ and $g(x) = f(x + 3)$. Use the graphs and equations of f and g to describe the transformation from the graph of f to the graph of g .



$g(x)$ is a shift left 3 of $f(x)$.

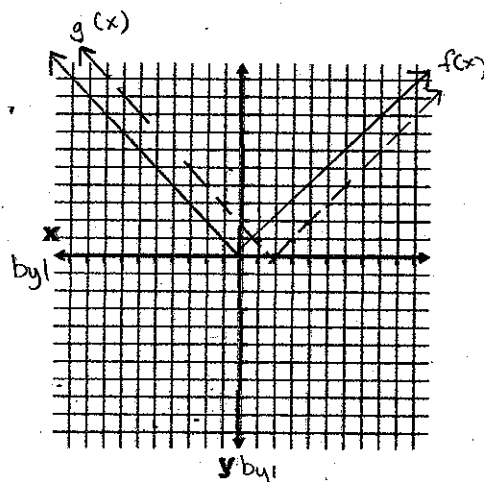
Graph the function (use your preferred method but make sure I can tell what method you are using). Compare the graph to the graph of $f(x) = |x|$. Determine the domain and range.

21. $g(x) = |x-2|$ vertex $(2,0)$

x	g(x)
0	2
1	1
2	0
3	1
4	2

$g(x)$ is a shift right 2 of $f(x)$.

$D: \mathbb{R}$ $R: \{y \geq 0\}$

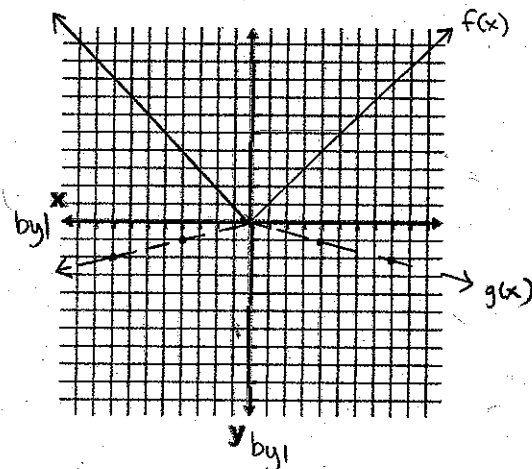


22. $g(x) = -\frac{1}{4}|x|$ vertex $(0,0)$

x	g(x)
-8	-2
-4	-1
0	0
4	-1
8	-2

$g(x)$ is a reflection over the x-axis and a vertical compression of $f(x)$

$D: \mathbb{R}$ $R: \{y \leq 0\}$



23. $g(x) = |x|+3$ $(0,3)$ vertex

x	g(x)
-2	5
-1	4
0	3
1	4
2	5

$g(x)$ is a shift up 3 of $f(x)$

$D: \mathbb{R}$ $R: \{y \geq 3\}$

