Module 7 Functions

Section 7.1 Function or Relation

7.1 Practice Problems

For Problem 1-8, use the information given to solve the problem.

1. Is the data in the table a function? Why or why not?

Input (x)	**Output** (y)
4	1
-3	2
2	2
-2	10
4	6
-3	4

2. Given the equation $y = x^2$, complete the table and tell whether or not the equation is a function.

$\boldsymbol{x}$	$\boldsymbol{y}$
-3	
-2	
-1	
0	
1	
2	
3	

3. Determine whether or not the data is a function: $\{(-6,-2);\ (1,2);\ (-3,-2);\ (4,8)\}$

4. Determine whether or not the data is a function: $\{(0,3);\ (4,-1);\ (2,-1);\ (0,6)\}$

5. Complete the table to determine whether the equation $y = \pm\sqrt{x}$ is a function or not.

$\boldsymbol{x}$	$\boldsymbol{y}$
25	
9	
4	
0	

6. How could you have known the solution to Problem 5 without completing the table?

7. Complete the table so the relation is not a function.

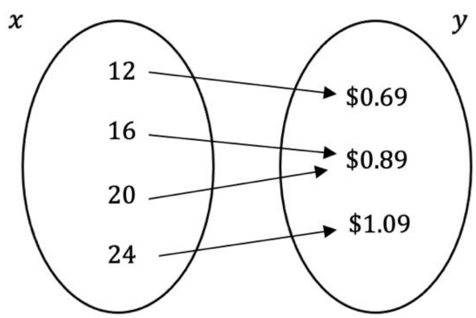
x	y
0	-1
1	4
2	5
3	-1
4	6
	7

8. Complete the table so the relation is a function.

$\boldsymbol{x}$	0	1	-1	2	
$\boldsymbol{y}$	2	3	5	8	10

For Problem 9-12, make a table of the mapping given and tell whether or not it is a function.

9. Ounces and Prices of cans of vegetables



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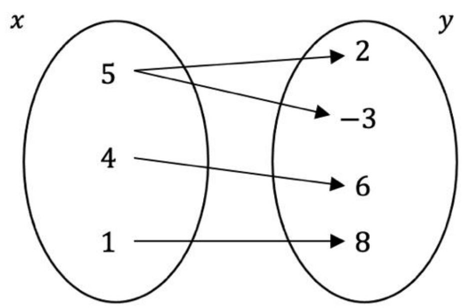

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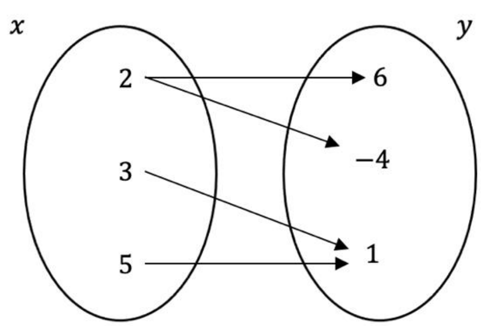

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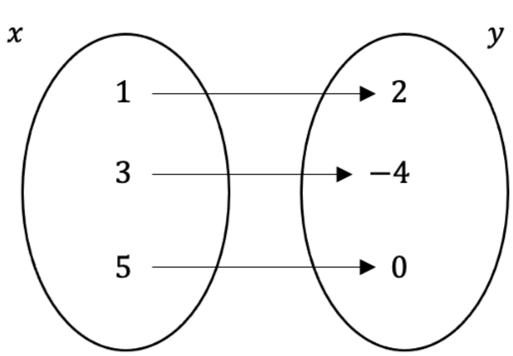


Why do you think this one is called a one-to-one function? Are all one-to-one mappings functions?

For Problem 13-15, fill in the blank.

13. For a relation to be a function, ____________________ ____________________ is mapped to exactly ______________________ output.

14. If the ____________________ repeats in a relation, the relation is not a function.

15. If the output repeats in a relation, but the input does not, the relation is a ______________________.

For Problem 16-20, complete the relation given to either make it a function or not.

16. To make it a function:

$$(\_\_\_\_\_\_, 3);\ (2, 6);\ (4, 9);\ (-1, -3)$$

17. To make it a function:

$$(5, 4);\ (2, \_\_\_\_\_\_);\ (1, 9);\ (-1, 1)$$

18. To make it a function:

$$(\_\_\_\_\_\_, \_\_\_\_\_\_);\ (2, -3);\ (4, -1);\ (0, 0)$$

19. To make it not a function:

$$(1, 2);\ (-1, 3);\ (\_\_\_\_\_\_, 2);\ (-5, 3)$$

20. To make it not a function:

$$(\_\_\_\_\_\_, -3);\ (\_\_\_\_\_\_, -2);\ (3, 4);\ (-5, 6)$$

Section 7.2 Types of Data

Practice Problems 7.2

For Problem 1-4, use the given data of Jamont's height over a course of six years to solve the problem.

x (**age in years**)	y (**height in years**)
7	3'10"
8	4'0"
9	4'4"
10	4'7$\frac{1}{2}$"
11	4'9"
12	5'0"

1. Does this data represent discrete or continuous data?

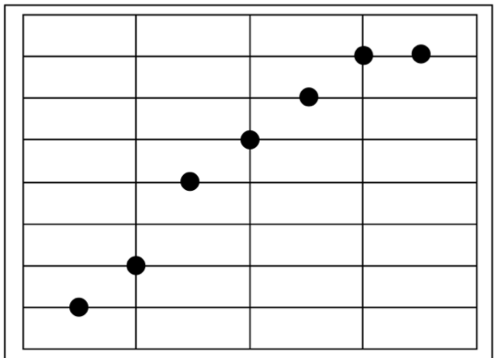
2. Is this a relation and/or a function?

3. Does this data appear to be linear?

4. Is the relationship between years and height a strong positive or strong negative correlation?

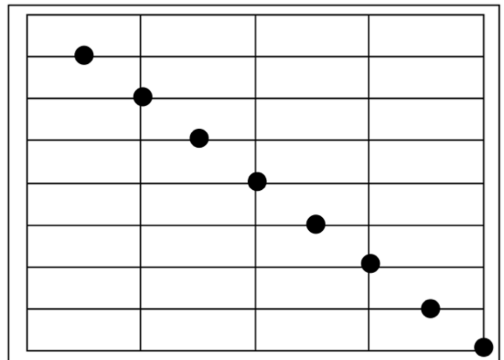
For Problem 5-8, circle whether the function is linear or nonlinear and whether the data is discrete or continuous.

5.



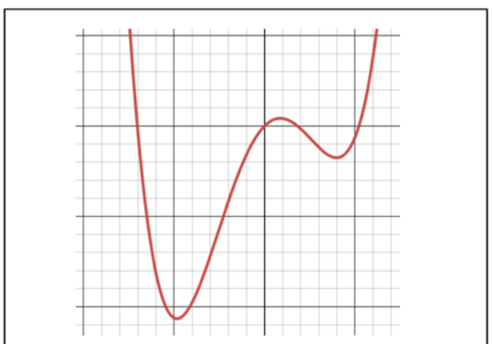
Linear	Nonlinear
Discrete	Continuous

6.



Linear	Nonlinear
Discrete	Continuous

7.



Linear	Nonlinear
Discrete	Continuous

8.

Linear	Nonlinear
Discrete	Continuous

For Problem 9-13, tell whether the data is categorical or numerical.

9. Hair Color

10. Favorite Movies

11. Height in Feet

12. Weight in Pounds

13. Time in Seconds

For Problem 14-18, tell whether the data is discrete or continuous.

14. A person's weight on their birthday each year

15. The amount of time to complete a project

16. The amount of rain, in inches, that falls in a storm

17. The temperature each morning for a week at 6:00 a.m.

18. The height of each child in a pre-school class.

For Problem 19 and 20, tell whether the statement is true or false.

19. Discrete data is often fractional or decimal numbers.

20. Values in a table always represent discrete data.

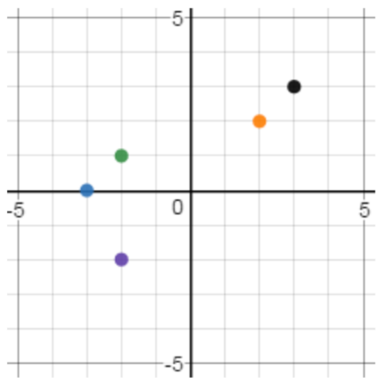
Section 7.3 Vertical Line Test

Practice Problems 7.3

For Problem 1-5, solve the word problem given.

1. If a graph is not a function, is it because the x-values repeat or the y-values repeat?

2. In the graph below, which two points demonstrate the relation is not a function?



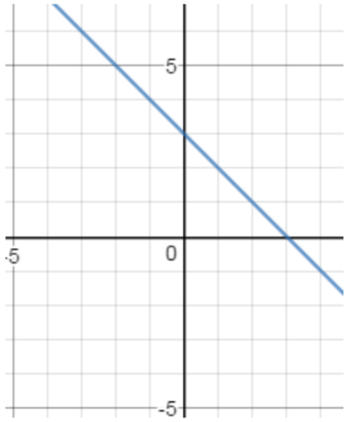
3. A relation is a set of ordered pairs. A function is a relation in which each input x is mapped to one unique value of y. What value of x could be changed in Problem 2 to make the relation also a function? What values of x would not make the relation a function?

4. Using the two points for which the Vertical Line Test was failed in Problem 2, would changing either of the y-values make the relation a function?

5. The cubic equation $y = x^3$ is a function. Name two methods that could demonstrate how you know if it is a function or not.

For Problem 6-9, use the Vertical Line Test to determine if each graph is or is not a function.

6.



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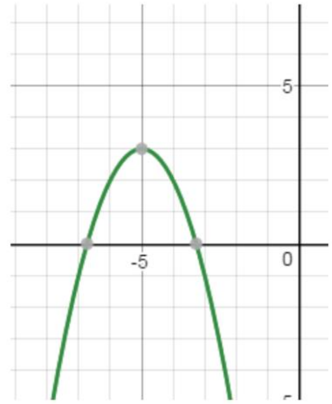

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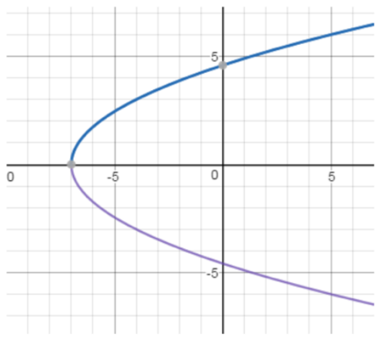

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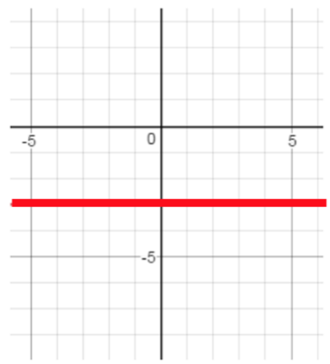
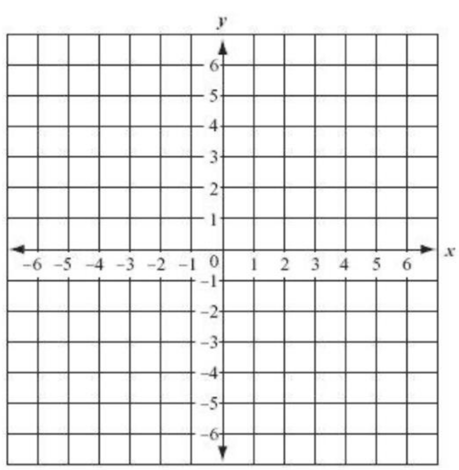


For Problem 10 and 11, solve the word problem given.

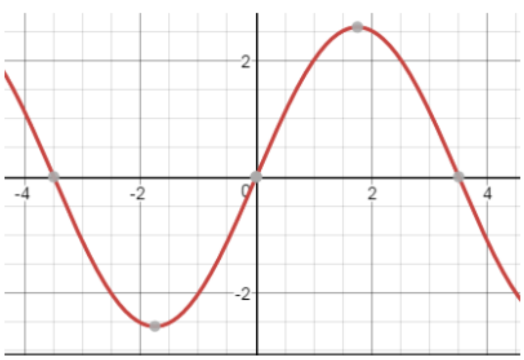
10. Draw the graphs of $y = x^2$ and $y = \pm\sqrt{x}$, and the line $y = x$ on the graph below. What does the line $y = x$ show you that might help you understand why these two functions are inverses?



11. Can the graph of a function be a horizontal line? Can the graph of a function be a vertical line? Explain why this is or is not so.

For Problem 12-15, tell whether the graph given is a function or not.

12.



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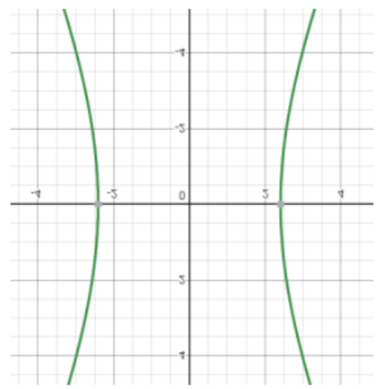

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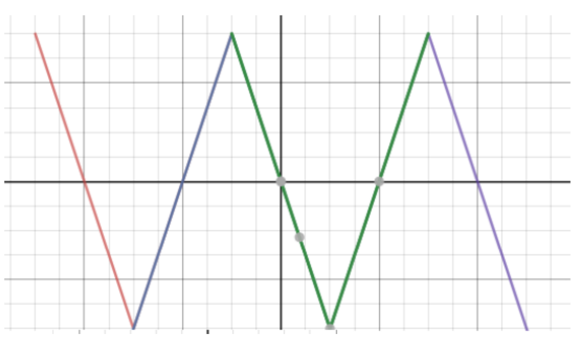

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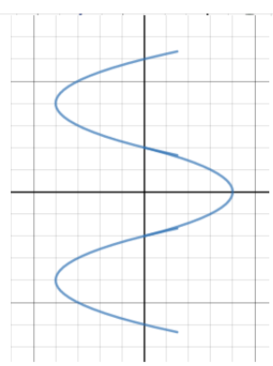


For Problem 16-20, tell if the graph of the equation given would or would not pass the Vertical Line Test.

16. $x = 4$

17. $y = -4$

18. $x = y$

19. $x + 2y = 4$

20. The power equations $y = x^2$, $y = x^3$, and $y = x^4$ are functions. Every $y = x$ to any power is called a power equation. Are all power equations functions? What about $y = -x^2$, $y = -x^3$, and $y = -x^4$ Explain why or why not.

Section 7.4 Input and Output

Practice Problems 7.4

Rather than problems, 1-4 are games for you to play using Input-Output tables for gameboards. Some of the inputs and some of the outputs are missing. Fill in the table to complete the gameboard and find the equation (if it is not given) for the table given.

1.

x	y
0	-20
1	
2	-10
3	
4	0
5	
6	10

2.

x	y
-3	9
-2	4
-1	
0	
	1
2	
3	

3.

x	0	2	4	6	8
y		20		40	

4.

x	y
-3	-9
-1	-3
$-\frac{1}{2}$	$-\frac{3}{2}$
$\frac{1}{2}$	
2	
	9

Complete the tables for Problem 5-6.

5. $y = \frac{1}{x}$

$\boldsymbol{x}$	$\boldsymbol{y}$
-2	
	-1
	Undefined
	$\frac{1}{4}$
	$\frac{1}{8}$
9	

6. $y = 2^x$

$\boldsymbol{x}$	0			6	7
$\boldsymbol{y}$		8	16		

For Problem 7-12, circle whether the phrases given are possible input values for x. (Ask yourself: "Are they allowable? Will I get an output when used for input?) More than one phrase may be circled.

7. $y = \frac{1}{x}$ All positive numbers Zero All negative numbers

8. $y = x^3 - 3$ All positive numbers Zero All negative numbers

9. $y = \frac{1}{x+4}$ All positive numbers Zero All negative numbers

10. $y = \frac{1}{x-4}$ All positive numbers Zero All negative numbers

11. $y = x + 3$ All positive numbers Zero All negative numbers

12. $y = \frac{1}{x-3}$ All positive numbers Zero All negative numbers

For Problem 13-18, use the function $y = x^2 + 3$ to solve the problem.

13. If the input is a negative number, will the output be a positive or negative number?

14. If the input for x is all positive integers, when will you get a negative integer as the output?

Always Sometimes Never

15. Will you ever get 0 for the output? Why or why not?

16. What is the largest integer the output will be?

17. What is the smallest integer the output will be?

18. What input will give the smallest integer?

For Problem 19 and 20, fill in the blank.

19. Make the equation so the smallest output is 4.

$$y = x^2 + \_\_\_\_\_\_\_\_\_\_$$

20. Make the equation so the smallest output will be 5.6.

$$y = x^2 + \_\_\_\_\_\_\_\_\_\_$$

Section 7.5 Function Machines

Practice Problems 7.5

For Problem 1-3, find the output for the function machine given when the input is -2, 0, or 4.

1.

$-2 \quad 0 \quad 4$

$\downarrow \quad \downarrow \quad \downarrow$

$\boxed{-3x+1}$

$\downarrow \quad \downarrow \quad \downarrow$

? ? ?

2.

$-2 \quad 0 \quad 4$

$\downarrow \quad \downarrow \quad \downarrow$

$\boxed{\frac{1}{2}x-5}$

$\downarrow \quad \downarrow \quad \downarrow$

? ? ?

3.

$-2 \quad 0 \quad 4$

$\downarrow \quad \downarrow \quad \downarrow$

$\boxed{\frac{1}{x+2}}$

$\downarrow \quad \downarrow \quad \downarrow$

? ? ?

For Problem 4-6, find the input for the function machine given when the output is -2, 0, or 4.

4.

? ? ?

$\downarrow \quad \downarrow \quad \downarrow$

$\boxed{10+x}$

$\downarrow \quad \downarrow \quad \downarrow$

$-2 \quad 0 \quad 4$

5.

? ? ?

$\downarrow \quad \downarrow \quad \downarrow$

$\boxed{2(x+3)}$

$\downarrow \quad \downarrow \quad \downarrow$

$-2 \quad 0 \quad 4$

6.

? ? ?

$\downarrow \quad \downarrow \quad \downarrow$

$\boxed{2x-8}$

$\downarrow \quad \downarrow \quad \downarrow$

$-2 \quad 0 \quad 4$

7. Tell what the function machine is doing to the input to get the output; what is the rule?
If the input is 2, the output is 3.
If the input is 5, the output is 9.
If the input is -4, the output is -9.

For Problem 8-10, complete the rule for the equation given.

8. $y = \frac{x+3}{2x}$

$y = \frac{4+3}{2(\_\_\_\_\_\_)}$

$y = \frac{7}{\_\_\_\_\_\_}$

9. $y = 3x^2 - 1$

$y = 3(-2)^2 - 1$

$y = 3(\_\_\_\_\_\_) - 1$

$y = \_\_\_\_\_\_ - 1$

$y = \_\_\_\_\_\_$

10. $y = |5x + 5|$

$y = |5(-2) + 5|$

$y = |(\_\_\_\_\_\_) + 5|$

$y = |\_\_\_\_\_\_|$

$y = \_\_\_\_\_\_$

For Problem 11-13, find y given the rule (equation), and the input.

11. If $y = x + 2$, then find y when $x = -1$.

12. If $y = 2x - 4$, then find y when $x = 3$.

13. If $y = -2|x + 4|$, then find y when $x = 0$.

For Problem 14-21, use $y = 3(x + 5)$ to solve the problem.

14. What does y represent? Input or Output

15. What does x represent? Input or Output

16. If $y = 3(2 + 5)$, what is the input, x?

17. Find y for the function in Problem 16. In other words, what is the output?

18. If $y = -81$, then can $x = 14$?

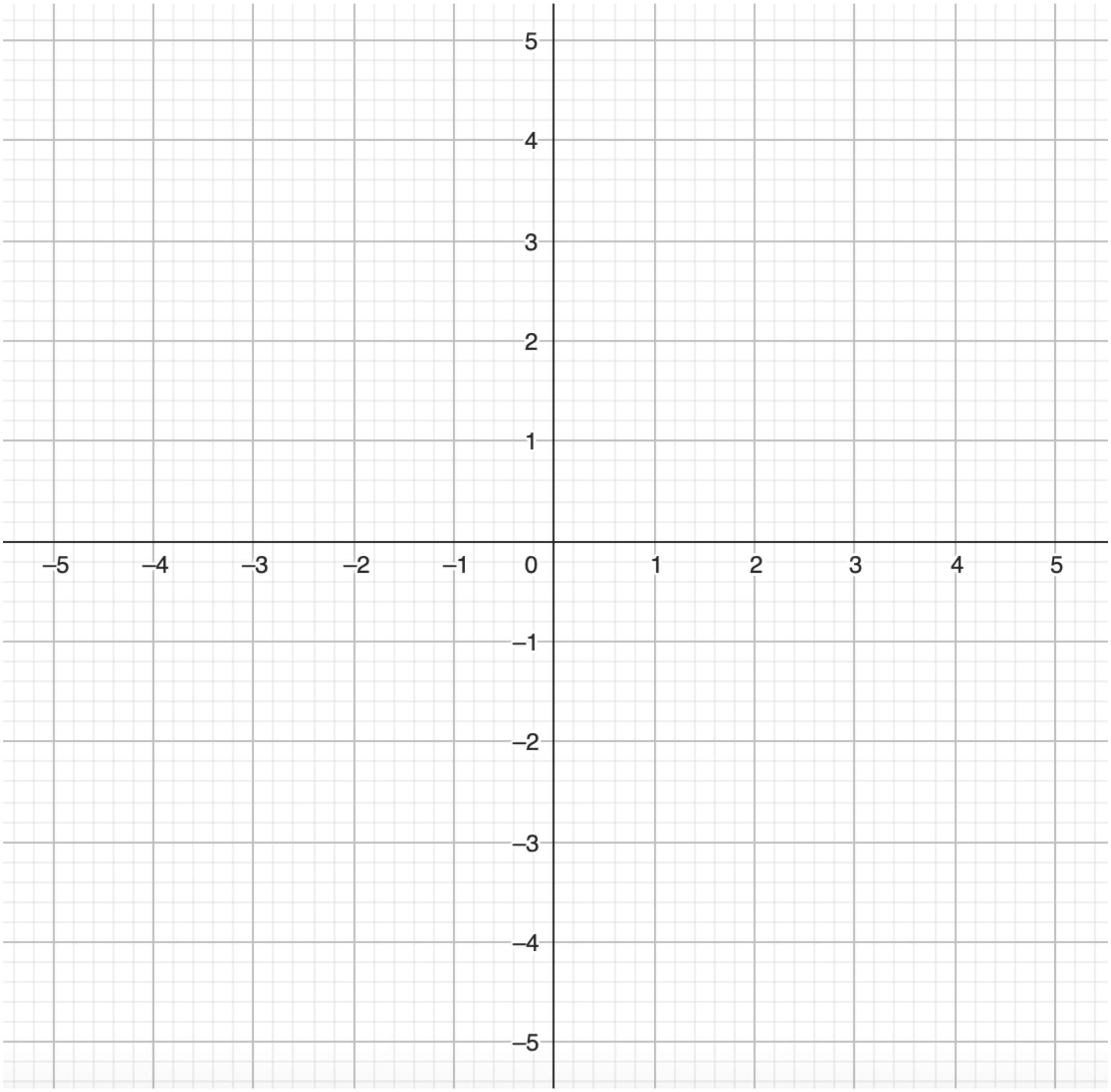
19. What is the input when the output is -27?

20. If you only input negative integers for x, will you ever get positive integers for output?

Section 7.6 Domain and Range

Practice Problems 7.6

For Problem 1-20, use the gameboard below to play the game.



For Problem 1-12, use the equation $y = x + 1$ to play the game.

1. Complete the table below.

x	y
-4	
-3	
-2	
-1	
0	
1	
2	
3	
4	

2. Write the coordinates as ordered pairs and place chips or coins on each of these points.

3. Move the chips or coins up or down until they meet the x-axis. If the table continued, how much of the axis would be covered?

4. Will any negative number used as an input result in an output value?

5. If 0 is used as an input, will it result in an output value?

6. Will any positive number used as an input result in an output value?

7. What is the domain of the function?

8. Put the chips back on the ordered pairs. Move the chips right or left until they meet the y-axis. How much of the axis is covered?

9. Is it possible to get a negative output?

10. Is it possible to get 0 as an output?

11. Is it possible to get a positive output?

12. What is the range of the function?

For Problem 13-20, use the equation $y = x^2 - 3$.

13. Complete the table below.

x	y
-2	
-1	
0	
1	
2	

14. Place chips or coins on the ordered pairs. Move them up or down to the x-axis. If the table continued in both directions, how much of the axis would be covered?

15. Circle all the possible input values that will give output values: Negative; Zero; Positive.

16. What is the domain of the function?

17. Place the chips back on the ordered pairs. Move them right or left to the y-axis. If the table continued in both directions, how much of the axis would be covered?

18. What is the range of the function?

19. What is the lowest point on the graph and how does it relate to the range?

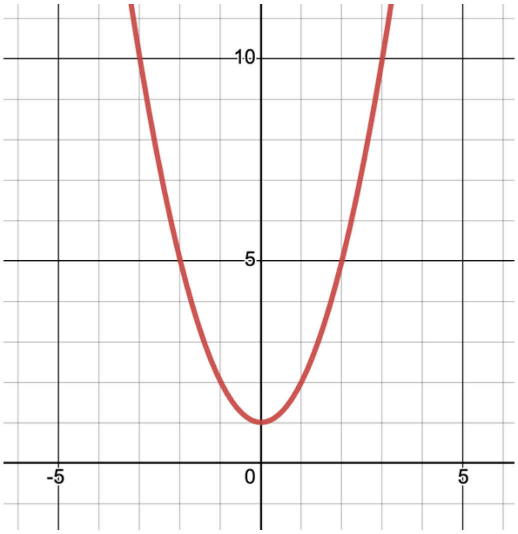
20. How is this range different than the range of the function $y = x^2$ in the lesson notes?

Section 7.7 Inequality Notation

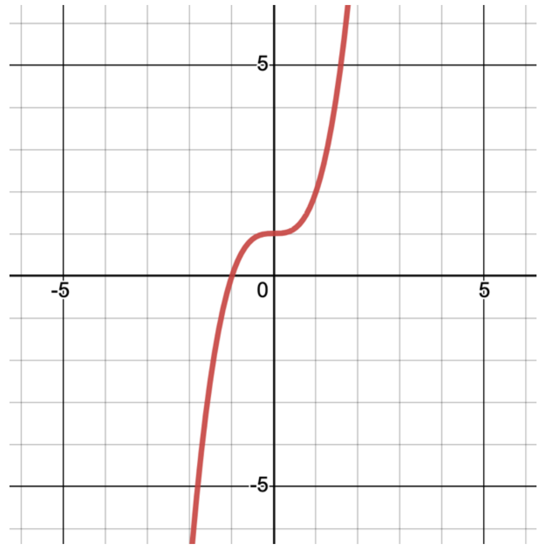
Practice Problems 7.7

For Problem 1-3, find the domain and range of the function given.

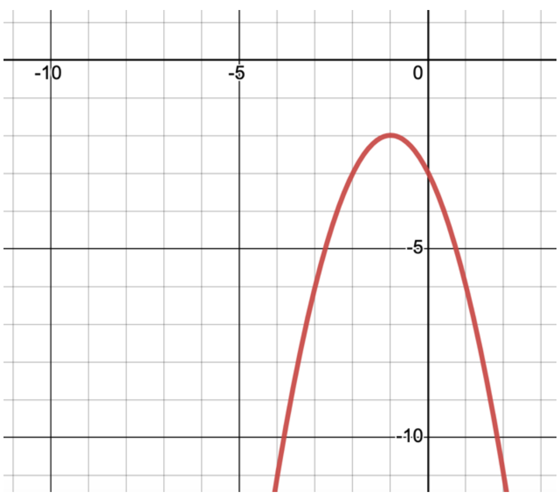
1. $y = x^2 + 1$



2. $y = x^3 + 1$



3. $y = -(x + 1)^2 - 2$



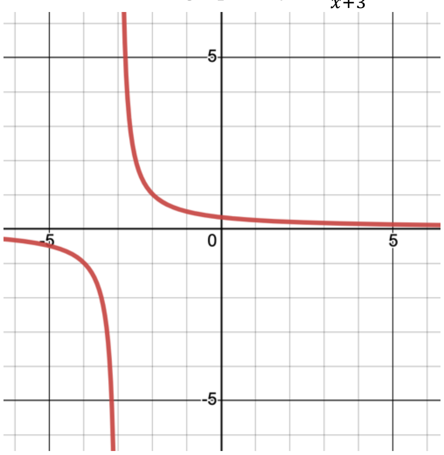
For Problem 4 and 5, solve the word problem given.

4. The power functions that are odd, such as $y = x$ and $y = x^3$, seem to have an infinite domain and range. What do you guess $y = x^5$ will have for a domain and range?

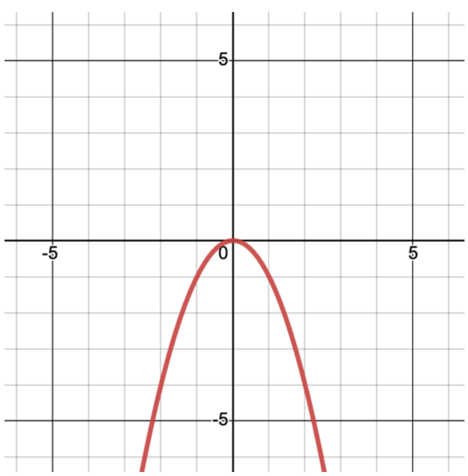
5. The power functions that are even, such as $y = x^2$ and $y = x^4$, are only above the x-axis with the range $y \geq 0$. Do you think this will be true for $y = x^6$? Why or why not?

For Problem 6-10, use the graph given to solve the problem.

6. Below is a graph of $y = \frac{1}{x+3}$. What is the asymptote for x? What is the asymptote for y?



7. Below is the graph of $y = -x^2$. Fill in the blanks for the domain and range.

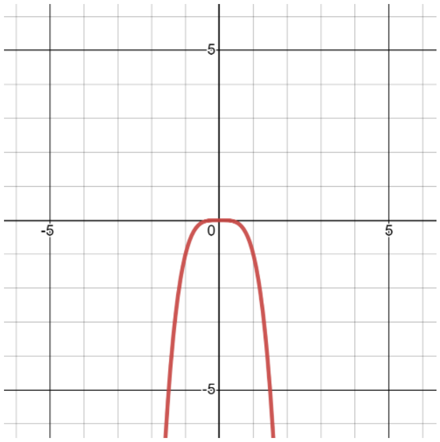


______________ $< x <$ ______________

$y \leq$ ______________

Another way to write the range is ________ $< y \leq$ ________

8. Below is the graph of $y = -x^4$. Fill in the blanks for the domain and range.

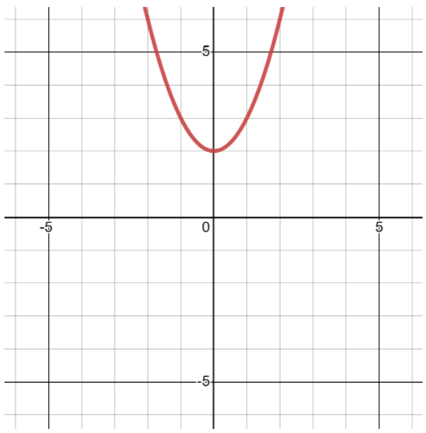


$\_\_\_\_\_\_\_\_\_\_ < x < \_\_\_\_\_\_\_\_\_\_$

$y \leq \_\_\_\_\_\_\_\_\_\_$

Another way to write the range is $\_\_\_\_\_\_ < y \leq \_\_\_\_\_\_$

9. Below is the graph of $y = x^2 + 2$. Fill in the blanks for the domain and range.

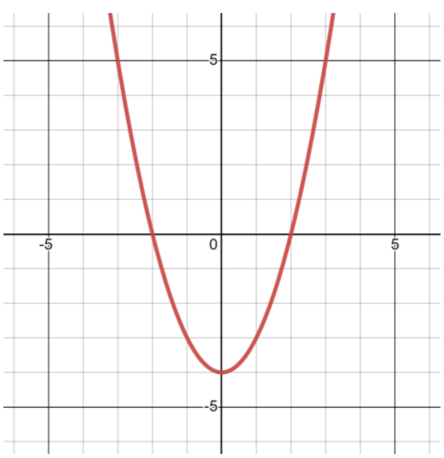


$\_\_\_\_\_\_\_\_\_\_ < x < \_\_\_\_\_\_\_\_\_\_$

$y \geq \_\_\_\_\_\_\_\_\_\_$

Another way to write the range is $\_\_\_\_\_\_ \leq y < \_\_\_\_\_\_$

10. Below is the graph of $y = x^2 - 4$. Fill in the blanks for the domain and range.



$\_\_\_\_\_\_\_\_\_\_ < x < \_\_\_\_\_\_\_\_\_\_$

$y \geq \_\_\_\_\_\_\_\_\_\_$

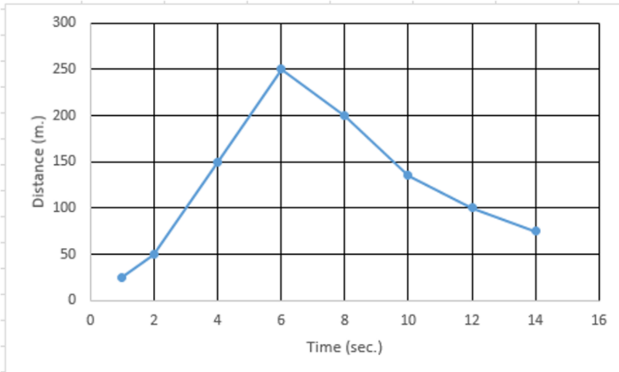
Another way to write the range is $\_\_\_\_\_\_ \leq y < \_\_\_\_\_\_$

Section 7.8 Interval Notation

Practice Problems 7.8

For Problem 1-4, use the information/diagram given to solve the problem.

1. The diagram below shows the time-distance graph in meters/second for the flight of a model rocket. Write the domain and range using inequality notation and interval notation.



2. Below is the time-distance table for the model rocket from Problem 1. The interval $[0, 6]$ represents 0 to 6 seconds for time. What is the interval for distance during that time?

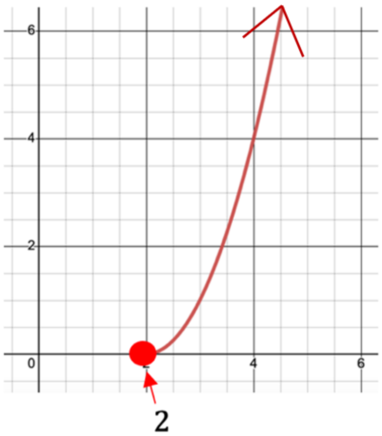
x	y
0	0
1	25
2	50
4	150
6	250
8	210
10	140
12	100
14	75

3. Using the table from Problem 2, write the time using interval notation for the distance $[0, 150]$.

4. The domain of the table from Problem 2 using interval notation is $[0, 14]$. What is the range over the entire interval?

For Problem 5-8, use interval notation to define the domain and range of the graph given.

5.



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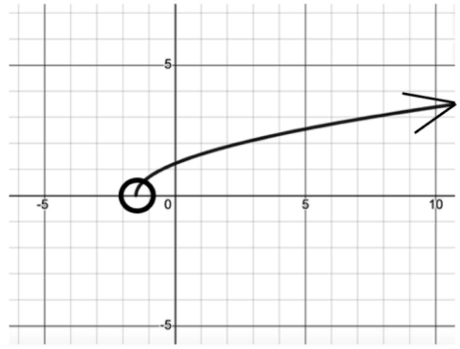

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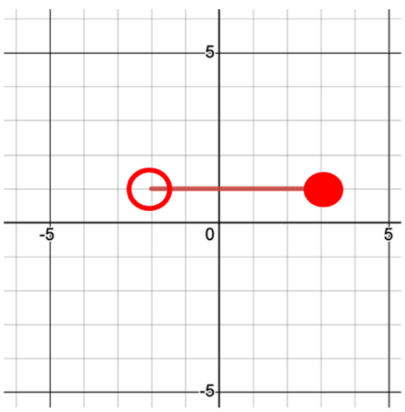

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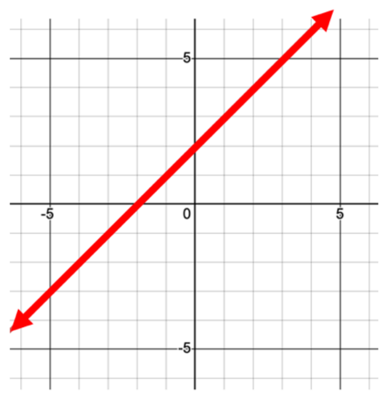


For Problem 9-14, convert the inequality to interval notation.

9. $-7.6 \le m \le 2.4$

10. $0.8 < n < \frac{27}{4}$

11. $-200 \le t < \infty$

12. $14 > x > 6$

13. $20 > x \ge -14$

14. $-\infty < x \le 210$

For Problem 15-20, convert the interval notation to an inequality; use any variable.

15. $\left[-6\frac{1}{2}, 4\frac{3}{4}\right)$

16. $(-\infty, \infty)$

17. $(0, 22.8)$

18. $[-34, 34]$

19. $[-100, 202]$

20. $[-4, \infty)$

Section 7.9 Lines of Best Fit

Practice Problems 7.9

For Problem 1-10, use the given information and table to solve the problem.

The approximate ticket sales at movie theatres from 2010-2015 is shown below in billions of dollars.

Year	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Sales (In Billions)	1.398	1.382	1.380	1.339	1.328	1.323

1. Is the line of best fit increasing or decreasing?

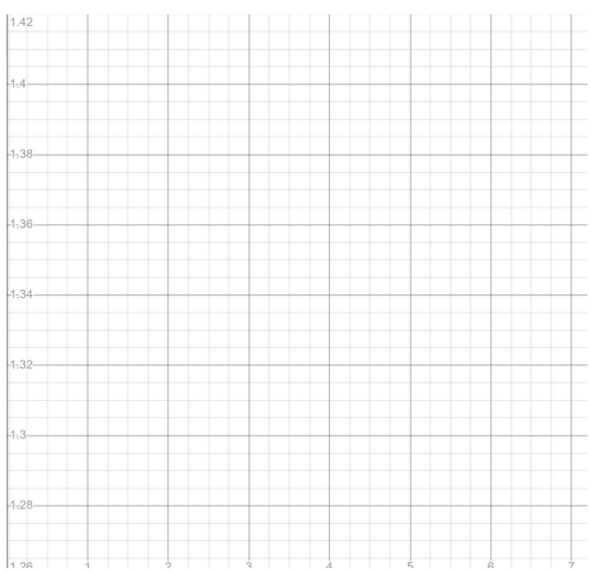
2. Is the relationship between the year and ticket sales linear or not?

3. Is the slope of the line of best fit positive or negative?

4. Lines of best fit are often called trend lines. What trend does the line for this table show?

5. Why do you think this trend is occurring? (This is your best guess, not proof.)

6. Draw the line of best fit on the given graph.



7. Find the slope of the line.

8. Find the y-intercept of the line.

9. Find the equation of the line of best fit.

10. Predict the approximate movie theatre ticket sales for 2016 and check your prediction using the graphing calculator.

Section 7.10 Correlation Coefficient

Practice Problems 7.10

For Problem 1-8, use the given information and table to solve the problem.

An arborist recorded the diameter and height of nine different trees.

Diameter (Inches)	2	3	4	5	6	7	8	9	10
Height (Feet)	9	9	10	14	16	18	22	27	30

1. Find the linear trend line or line of best fit that models the set of data using the graphing calculator.

2. What is the slope of the line of best fit? What does it mean?

3. What is the y-intercept of the line of best fit? What does it mean?

4. What is the r-value of the line of best fit?

5. Is the correlation of the line of best fit positive or negative?

6. Is the correlation of the line of best fit strong or weak?

7. Is there a relationship between the diameter and height of a tree?

8. What would be the predicted height of a tree with a diameter of 6.5 inches? Use both the graph and the equation for the line of best fit to answer the question.

For Problem 9-16, use the given information and table to solve the problem.

A marine biologist recorded the weight and length of nine different catfish.

Length (Inches)	8.4	8.5	9.1	9.4	10.3	12.4	15.6	17.1	18.2
Weight (Pounds)	0.3	0.6	0.9	1.2	2.2	2.5	3.4	3.7	3.9

9. Find the linear trend line or line of best fit that models the set of data using the graphing calculator.

10. What is the slope of the line of best fit? What does it mean?

11. What is the y-intercept of the line of best fit? What does it mean?

12. What is the r-value of the line of best fit?

13. Is the correlation of the line of best fit positive or negative?

14. Is the correlation of the line of best fit strong or weak?

15. Is there a relationship between the length and weight of a catfish?

16. What would be the predicted weight of a catfish that is 20 inches long? Use both the graph and the equation for the line of best fit to answer the question.

Section 7.11 Solving Systems by Graphing

Practice Problems 7.11

For Problem 1-4 follow the instructions to solve the problem.

When Christ was born the Magi brought gifts of gold, frankincense, and myrrh, each foreshadowing an aspect of Christ's life. As gold is a precious metal, He is King of Kings and Lord of Lords. As frankincense is a perfume of incense, Jesus was a pleasing aroma to God and would be anointed with perfume in His last days. As myrrh is an oil for anointing, it is often on behalf of all people. Myrrh was mixed with wine and offered to Jesus on the cross to deaden some of the pain of crucifixion; Jesus refused it.

In Isaiah 60:6, the prophet proclaims hundreds of years before the birth of Christ: "They will bring gold and frankincense, and will bear good news of the praises of the Lord."

Just as the Magi brought gifts to Jesus, we give gifts to one another at Christmas to celebrate of the birth of Christ. At that time, gifts are traditionally given to loved ones and those in need. The steps for wrapping a present are as follows:

1. Put the gift in the box
2. Close the box
3. Wrap paper around the box and tape it shut
4. Put ribbon and a bow on the box

When the gift is given, the receiver "undoes" what the gift-giver did. What are the reverse steps for opening a present? Write the reverse process for Steps 1-4.

1.

2.

3.

4.

Sometimes we must "undo" an equation to solve for x in terms of y. You must put both equations in slope-intercept or $y-$ intercept form in order to graph the two equations and solve the system of equations.

For Problem 5-10, use the given information to solve the problem.

At the local game store, there are two payment plans. Game rental is $6.00 per game with no annual (yearly) fee or one can pay $1.00 per game with a $25.00 annual (yearly) fee.

5. What two systems of equations represent the game rental plan? Let x be the number of games rented and y be the total cost.

6. What is the slope of or rate of change for no annual fee? What does it represent?

7. What is the slope or rate of change for a $25.00 annual fee?

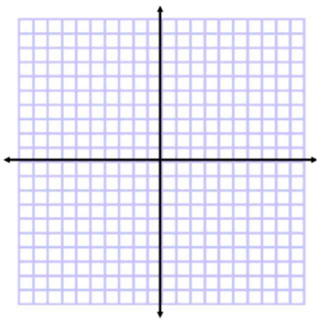
8. What is the point of intersection for the two equations if you graph them both on the same coordinate-plane? (Use the graphing calculator.)

9. What does the point of intersection represent?

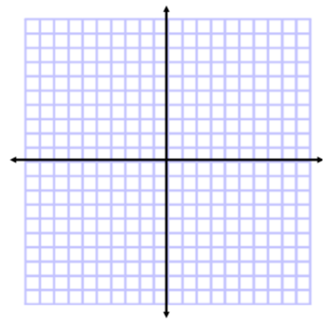
10. Which is the better plan if your cousin is in town for one week? Which is the better plan for a year?

For Problem 11-13, find the solution to the system of equations given by graphing it by hand.

11. $y = -x$
$y = x$



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



13. $y = x + 4$
$y = x - 5$

For Problem 14 and 15, convert the standard form equation to slope-intercept form.

14. $2x + 3y = 9$

15. $12x + 4y = -16$

For Problem 16, solve for y in each equation first to find the solution to the given system.

16. $2x + 2y = 4$
$x + y = 2$

For Problem 17-20, find the solution to the system of equations given by graphing them using the graphing calculator.

17. $y = -\frac{1}{2}x + 4$
$y = \frac{1}{2}x + 1$

18. $y = 2x + 7$
$y = x + 4$

19. $y = 3x + 2$
$y = 5x + 1$

20. $y = 4x + 2$
$y = 4x - \frac{1}{3}$

Section 7.12 Solving Systems by Substitution

Practice Problems 7.12

For Problem 1-5, use the given information to solve the problem.

Two websites offer a hard drive for two different prices and two different shipping fees. Store Zoom charges $5.25 for a hard drive plus $2.50 per pound for shipping. Store Sinc-IT charges $9.00 for a hard drive plus $1.25 per pound for shipping.

1. Write the system of equation to show the charges for shipping a hard drive from Zoom and Sinc-IT. Let x be the number of pounds and y be the shipping charges.

2. Solve the system using substitution.

3. At what number of pounds will the shipping charges be the same?

4. What is the shipping charge that is the break-even point?

5. Which company will be a better deal for shipping charges after the break-even point?

For Problem 6-10, substitute the values given for x to solve for y.

6. $y = x + 5$
   $x = 4$

7. $y = 2x - 8$
   $x = 5$

8. $x = 0$
   $y = 16x - 10$

9. $y = 3x - 4$
   $x = -2$

10. $x = -5$
    $y = -5x + 4$

For Problem 11 and 12, substitute the expression for x into the other equation to solve for y and then find x.

11. $x = 2y + 1$
    $10y = 4x$

12. $x = -y + 8$
    $5y = 3x$

For Problem 13-16, substitute the values for y into the other equation and solve for x.

13. $x = y + 1$
    $y = -3$

14. $2x + 3y = 5$
    $y = x$

15. $x = 2y + 7$
    $y = -5$

16. $x + y = -21$
    $y = 2x$

For Problem 17-20, solve by substitution.

17. $y = 2x - 8$
$y = 4 - x$

18. $y = 6 + x$
$y = 3 + 4x$

19. $y = 2x + 7$
$y = 4x - 9$

20. $y = 4x + 5$
$y = 5x + 13$

Section 7.13 Solving Systems by Elimination

Practice Problems 7.13

For Problem 1 and 2, use the given information to solve the problem.

A runner is 25 feet ahead of another runner and they are running at the same rate.

1. Will the runner behind ever catch up to the runner ahead of them?

2. What would have to happen for the runner behind to catch up to the runner ahead of them?

3. Circle the correct system of equations that has the sum of two numbers equal to 4 and the difference of the two numbers equal to -5.

a) $2x = 4$
$2y = -5$

b) $x + y = -4$
$x - y = 5$

c) $x + y = 4$
$x - y = -5$

d) $y = x + 4$
$y = x - 5$

For Problem 4-6, answer true or false.

4. A system can be used to compare data.

5. The equation $y = x + 6$ along with $2x + y = -9$ has a solution of $(-5, 1)$.

6. Systems of equations have four possible types of solutions.

7. Which equation along with the equation $x - y = 6$ has a solution of $(-4, -10)$?

a) $x - 2y = -24$

b) $2x + y = -18$

c) $x + y = 14$

d) $x - y = -6$

For Problem 8-10, solve the system of equations given using elimination by addition.

8. $2x - 3y = -7$
$x + 3y = 10$

9. $x + 4y = 22$
$-x + 3y = 13$

10. $-5x + y = -2$
$5x + 2y = 26$

For Problem 11-13, solve the system of equations given using elimination by subtraction.

11. $4x + 3y = -8$
$4x - 2y = 12$

12. $3x - 2y = 10$
$x - 2y = 2$

13. $x - 5y = -5$
$x + 3y = 11$

14. Solve the system of equations given using elimination with multiplication.

$$2x - 2y = 2$$
$$3x - 4y = 7$$

For Problem 15-18, tell whether it is better to use substitution or elimination to solve the system of equations given.

15. $3x + 5y = -10$
$3x - y = 14$

16. $y = x + 9$
$y = -3x - 7$

17. $x - 4y = -6$
$x = 4$

18. $x + y = 15$
$3x - y = 5$

For Problem 19 and 20, solve the word problem given.

19. If two linear functions have the same slope but different y-intercepts when the system of equations is graphed, is there one solution, no solution, or infinite solutions?

20. If two linear functions have different slopes but the same y-intercept when the system of equations is graphed, will they have the same x-coordinate at that point?

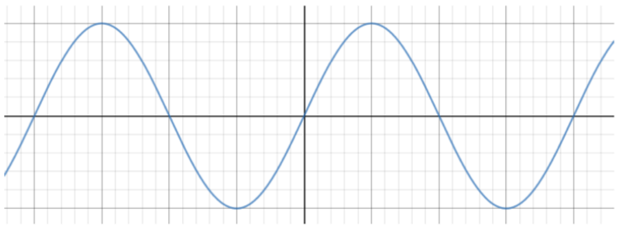
Section 7.14 Module Review

For Problem 1-6, tell whether the ordered pair, table, graph, or equation is a function or not.

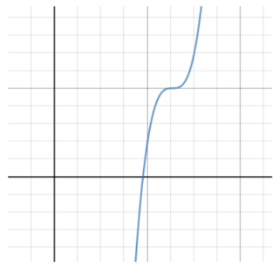
1. $3x + 2y = -6$

2. $(2, -1), (3, 4), (0, -8), (2,1)$

3.



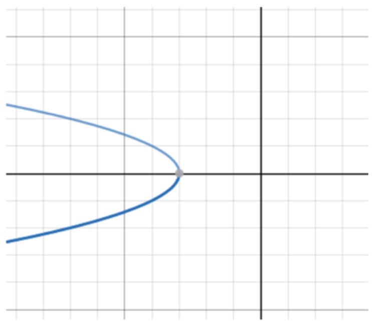
4.



5.

x	y
-3	0
-1	5
1	-1
4	4
8	-1

6.



For Problem 7-12, let $f(x) = \frac{x+4}{3}$ and $g(x) = 2x$.

7. Find $f(x)$ when $x = 6$

8. Find $g(-18)$

9. If $g(x) = -24$, find x

10. If $f(x) = 9$, find x

11. What type of function is $g(x)$?

12. Let $h(x) = 3x - 8$. What are the outputs for $h(x)$ when the inputs are -1, 0, and 1?

For Problem 13-15, solve the system of equations by substitution or elimination.

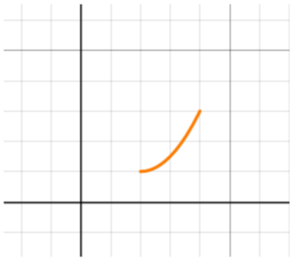
13. $y = 2x - 8$
$y = x + 4$

14. $x + y = -10$
$-x + 2y = 13$

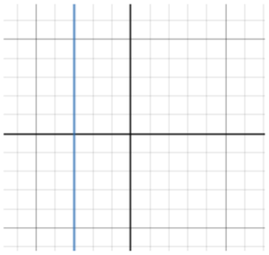
15. $2x + y = 11$
$2x + 2y = 16$

For Problem 16-19, find the domain and range of the function given. Write your solution in inequality and interval notation.

16.



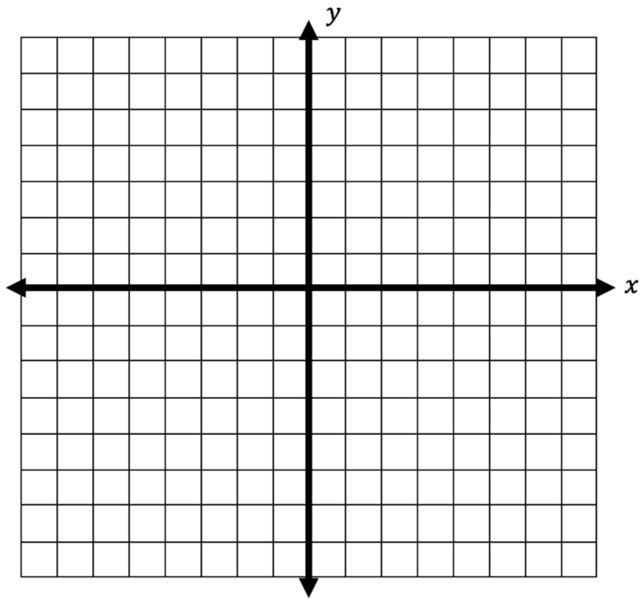
17.



18. $y = x^2 + 2$

19. $y = (x + 2)^2$

20. Graph the data in the table below. Is there a positive correlation, a negative correlation, or no correlation?



x	y
-3	7
-2	6
-1	4
0	2
1	2
2	-1
3	0

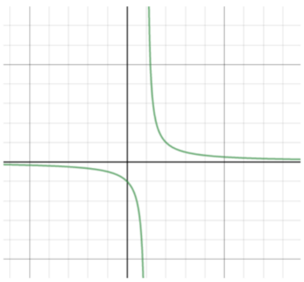
Section 7.15 Module Test

For Problem 1-6, tell whether the ordered pair, table, graph, or equation is a function or not.

1. $x^2 + 2x - 3 = y$

2. $(1, 2), (-2, 3), (0, 3), (2, -4)$

3.



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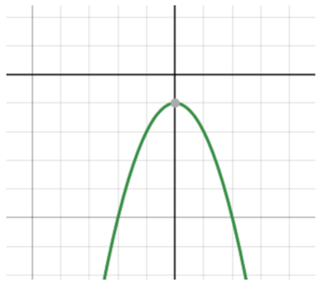


5.

x	y
-2	0
-1	1
0	3
1	5
-1	7

6.

For Problem 7-12, let $f(x) = -3x - 4$ and $g(x) = \frac{x}{5}$.

7. Find $f(x)$ when $x = -1$.

8. Find $g(10)$.

9. If $g(x) = 3$, find x.

10. If $f(x) = 14$, find x.

11. What type of function is $g(x)$?

12. Let $h(x) = \frac{x+3}{4}$.
Find $h(-1)$, $h(0)$, and $h(2)$.

For Problem 13-15, solve the system of equations by substitution or elimination.

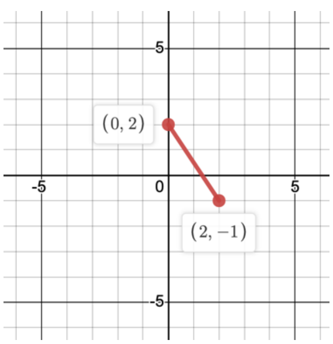
13. $2x - y = -6$
$3x + y = 10$

14. $-5x + 2y = 1$
$-4x + 2y = 2.$

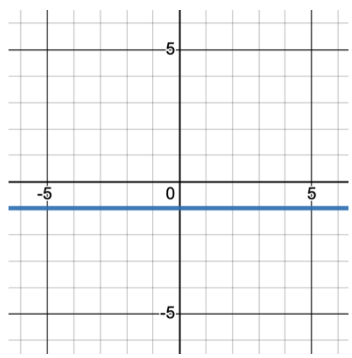
15. $-x + y = 15$
$y = -10$

For Problem 16-19, find the domain and range of the function given. Write your solution in inequality and interval notation.

16.



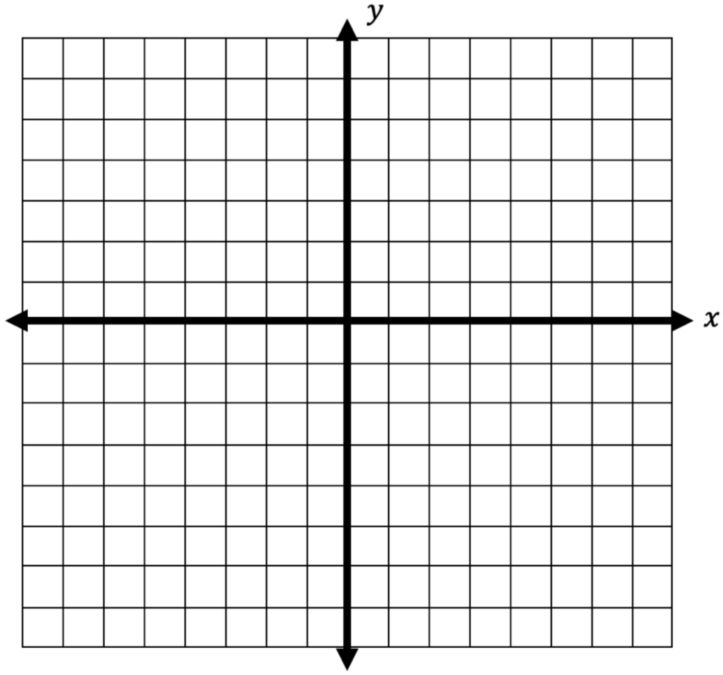
17.



18. $y = (x + 3)^2 + 4$

19. $y = x^3 - 5$

20. Graph the data in the table below. Is there a positive correlation, a negative correlation, or no correlation?



x	y
-3	-6
-2	-5
-1	-3
0	2
1	2
2	4
3	7