

Lesson 7.1 • Secret Codes

Name _____ Period _____ Date _____

1. Use this table to code each word.

Input	A	B	C	D	E	F	G	H	I	J	K	L	M
Coded output	M	N	O	P	Q	R	S	T	U	V	W	X	Y
Input	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Coded output	Z	A	B	C	D	E	F	G	H	I	J	K	L

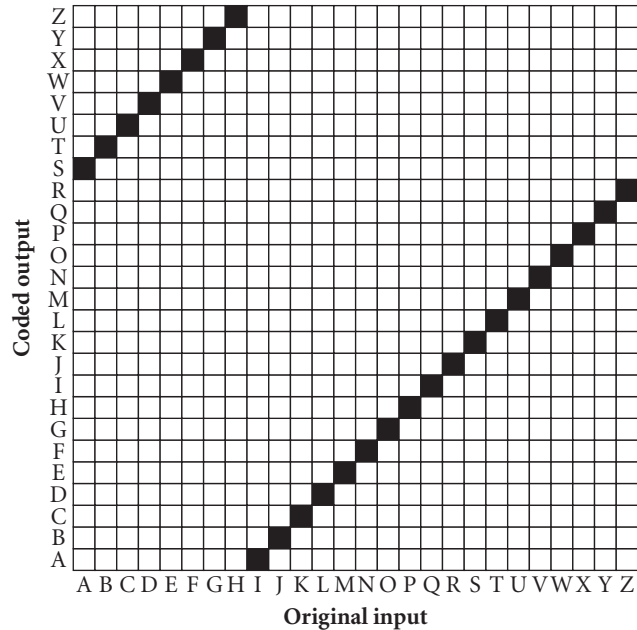
- a. ALGEBRA b. EQUATION c. SOLVE

2. Use this coding grid to decode each word.

- a. KGU UWJ
- b. JSVAG
- c. WAFKLWAF

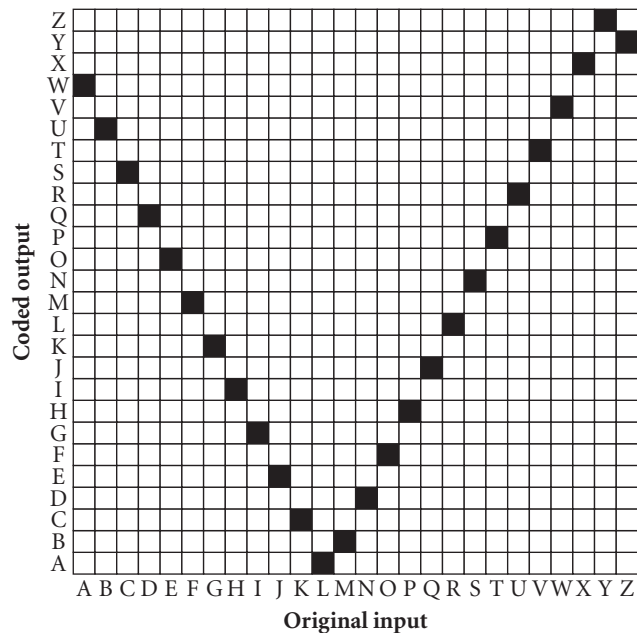
3. Luisa used a letter-shift code to code her name as TCQAI.

- a. Write the rule or create the coding grid for Luisa's code.
- b. Use Luisa's code to decode BWX AMKZMB.



4. Use this coding grid to answer 4a–c.

- a. What are the possible input values?
- b. What are the possible output values?
- c. Is this code a function? Explain why or why not.



Lesson 7.2 • Functions and Graphs

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1. Use the given equations to find the missing output values.

a. $y = 3 - x$

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

b. $y = -1.5 + 3x$

Input x	Output y
-2	
-1.5	
-1	
-0.5	
0	
0.5	
1	

c. $y = 6.8 + 0.5x$

Input x	Output y
-6	
-2.4	
1	
2.8	
-14	
3.1	
-17.5	

2. Use the given equations to find the missing domain and range values.

a. $y = -3x + 5$

Domain x	Range y
-4	
-2	
	5
3	
	-7

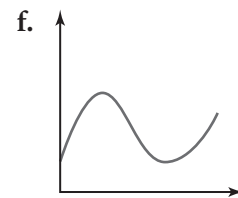
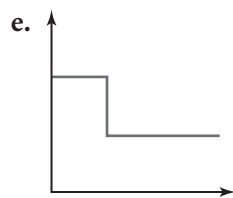
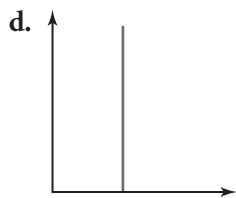
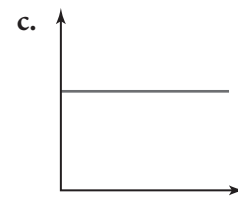
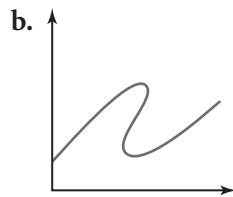
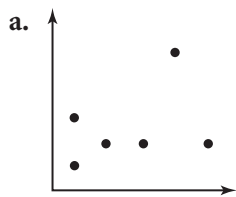
b. $2x - 3y = 6$

Domain x	Range y
	0
0	
	2
-6	
	5

c. $x^2 - 2y = 11$

Domain x	Range y
-3	
0	
	7
1	
4	

3. Find whether each graph represents a function.



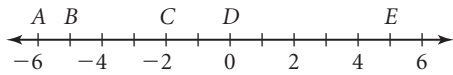
Lesson 7.3 • Graphs of Real-World Situations

Name _____ Period _____ Date _____

1. For each relationship, identify the independent variable and the dependent variable. Then sketch a reasonable graph for each situation and label the axes. Write a few sentences explaining each graph. In your explanations, use terms such as *linear*, *nonlinear*, *continuous*, *discrete*, *increasing*, and *decreasing*.
 - a. The temperature of a carton of milk and the length of time it has been out of the refrigerator
 - b. The number of cars on the freeway and the level of exhaust fumes in the air
 - c. The temperature of a pot of water as it is heated
 - d. The relationship between the cooking time for a 2-pound roast and the temperature of the oven
 - e. The distance from a Ferris-wheel rider to the ground during two revolutions

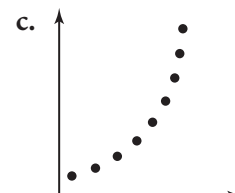
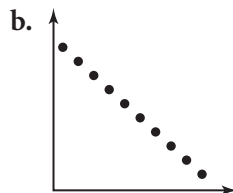
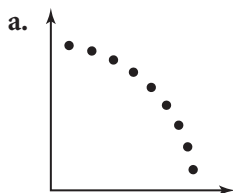
2. Sketch a graph of a continuous function to fit each description.
 - a. Linear and increasing, then linear and decreasing
 - b. Neither increasing nor decreasing
 - c. Increasing with a slower and slower rate of change
 - d. Decreasing with a slower and slower rate of change, then increasing with a faster and faster rate of change
 - e. Increasing with a slower and slower rate of change, then increasing with a faster and faster rate of change

3. Write an inequality for each interval in 3a–f. Include the least point in each interval and exclude the greatest point in each interval.



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|---------------|---------------|---------------|
| a. A to B | b. B to D | c. A to C |
| d. B to E | e. C to E | f. C to D |

4. Describe each of these discrete function graphs using the words *increasing*, *decreasing*, *linear*, *nonlinear*, and *rate of change*.



Lesson 7.4 • Function Notation

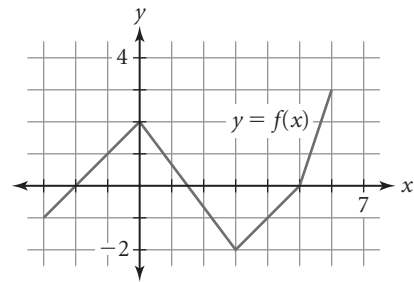
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- Find each unknown function value or x -value for $f(x) = 4x - 7$ and $g(x) = -3x + 5$ without using your calculator. Then enter the equation for $f(x)$ into Y1 and the equation for $g(x)$ into Y2. Use function notation on your calculator to check your answers.

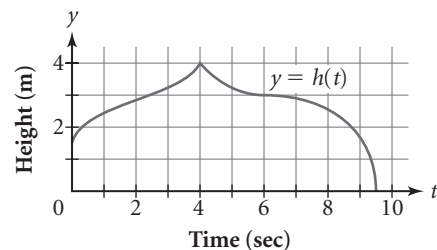
a. $f(2)$	b. $f(0)$	c. $f(-3)$	d. x , when $f(x) = -3$
e. $g(6)$	f. $g(-7)$	g. $g(0.5)$	h. x , when $g(x) = 5$
i. $f(3.25)$	j. $g\left(\frac{2}{3}\right)$	k. x , when $f(x) = -\frac{13}{3}$	l. x , when $g(x) = 11.9$
- Find the y -coordinate corresponding to each x -coordinate or vice versa for the functions $f(x) = 2x^2 - 4x - 5$ and $g(x) = 40(1 - 0.2)^x$. Check your answers with your calculator.

a. $f(1)$	b. $f(-3)$	c. $f(0)$	d. $f(2)$
e. $f(-0.5)$	f. $g(1)$	g. $g(-1)$	h. x , when $g(x) = 40$

- Use the graph of $y = f(x)$ to answer each question.
 - What is the value of $f(0)$?
 - What is the value of $f(3)$?
 - For what x -value or x -values does $f(x)$ equal 3?
 - For what x -value or x -values does $f(x)$ equal 0?
 - What are the domain and range shown on the graph?



- The graph of the function $y = h(t)$ shows the height of a paper airplane on its maiden voyage.
 - What are the dependent and independent variables?
 - What are the domain and range shown on the graph?
 - Use function notation to represent the plane's height after 6 seconds.
 - Use function notation to represent the time at which the plane was 4 meters high.



- The function $f(x) = 2.5x + 1.5$ represents the distance of a motorized toy car from a motion sensor, where distance is measured in meters and time (x) is measured in seconds.
 - Find $f(3)$. Explain what this means.
 - How far is the car from the sensor at time 0? Express your answer using function notation.
 - When will the car be 12.5 meters from the sensor? Express your answer using function notation.

Lesson 7.5 • Defining the Absolute-Value Function

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1. Find the value of each expression without using a calculator. Check your results with your calculator.

a. $|12|$

b. $|-9|$

c. $\left|-\frac{4}{3}\right|$

d. $-|7|$

e. $|-7|$

f. $|-11 + 6|$

g. $|-11| + |6|$

h. $|-4| - |3|$

i. $|-7| \cdot |5|$

j. $\frac{|-18|}{|6|}$

k. $-3|4 - 9|$

l. $|-3|^{-2}$

m. $4|-5|^{-1}$

n. $5|-3|^2$

o. $-3|(-4)(5)|$

2. Find the x -values that satisfy each equation.

a. $|x| = 6$

b. $|x| = 3.14$

c. $|x| = -4.5$

d. $|x + 3| = 11$

e. $|x| + 3 = 11$

f. $|x - 3| = 5$

g. $|x| \geq 8$

h. $|x| < 5.5$

i. $|x + 9| > 11$

3. Evaluate both sides of each statement to determine whether to replace the box with $=$, $<$, or $>$. Use your calculator to check your answers.

a. $|12 - 7| \square |7 - 12|$

b. $\frac{|30|}{|-5|} \square \left|\frac{30}{-5}\right|$

c. $-|-6| \square -(-6)$

d. $5^{-2} \square |5^{-2}|$

e. $(-3)^4 \square |-3|^4$

f. $(-5)^3 \square |-5|^3$

g. $|14 - (-6)| \square |14| - |-6|$

h. $|21 - 13| \square |21| - |13|$

i. $3|12 + 7| \square 3|12| + 3|7|$

4. Find each value if $f(x) = 2 - 3x$ and $g(x) = |2 - 3x|$.

a. $f(-4)$

b. $f(-1)$

c. $f(1)$

d. $f(2)$

e. $f(5)$

f. $f(8)$

g. $g(-4)$

h. $g(-1)$

i. $g(1)$

j. $g(2)$

k. $g(5)$

l. $g(8)$

m. x , when $f(x) = 22$

n. x , when $g(x) = 22$

o. x , when $f(x) = -7$

p. x , when $g(x) = -7$

Lesson 7.6 • Squares, Squaring, and Parabolas

Name _____ Period _____ Date _____

1. The length of a rectangle is 2 cm greater than the width.

- Complete the table by filling in the missing width, length, perimeter, and area of each rectangle.
- Let x represent the width of the rectangle. Use function notation to write an equation for the perimeter.
- Is the relationship between width and perimeter linear? Explain why or why not.
- Let x represent the width of the rectangle. Use function notation to write an equation for the area.
- Is the relationship between width and area linear? Explain why or why not.

Width (cm)	Length (cm)	Perimeter (cm)	Area (cm ²)
1			
2			
		16	
			24
9			
		52	
		68	288

2. Find the value of each expression without using a calculator. Check your results with your calculator.

- | | | | |
|------------------|-----------------|------------------|------------------|
| a. 4^2 | b. $(-3)^2$ | c. 1.1^2 | d. $(-0.5)^2$ |
| e. $-(-8)^2$ | f. $\sqrt{49}$ | g. $\sqrt{0.81}$ | h. $\sqrt{1.44}$ |
| i. $3\sqrt{121}$ | j. $-\sqrt{36}$ | k. $(0.2)^3$ | l. 2^{-2} |

3. Solve each equation for x . Use a calculator graph or table to verify your answers.

- | | | |
|----------------------|------------------------|----------------------|
| a. $ x = 6.13$ | b. $ x - 4 = 8$ | c. $ 2x = 6$ |
| d. $ x + 5 = 7$ | e. $x^2 = 121$ | f. $(x - 3)^2 = 625$ |
| g. $x^2 = -2.56$ | h. $x^2 + 1 = 8.29$ | i. $x^2 = 5$ |
| j. $ x - 2 + 9 = 3$ | k. $ x + 4 - 12 = -5$ | l. $\sqrt{x} = 2.5$ |

4. Sketch the graphs of $y = |x|$ and $y = x^2$ on the same set of axes. Describe the similarities and differences of the graphs.