Lesson 6.2 Representing Functions Day 2

Week 1 Tuesday Course 3 Warm-up

A total of 95 theme park tickets were sold for $960. Each adult ticket cost $12 and each child's ticket cost $9. Find the number of adult tickets and the number of children's tickets sold.

Finding Functions

Which table DOES NOT represent a function?

A)

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

C)

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

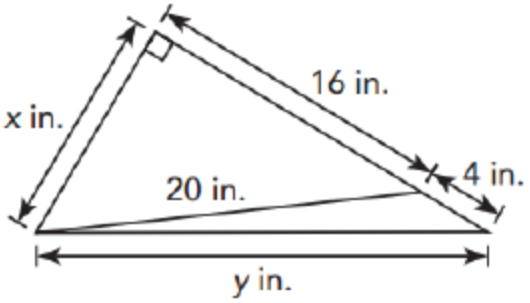
B)

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

D)

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

Calculate the missing length Y. Round to nearest tenth



Lesson 6.2 Representing Functions Day 2

A total of 95 theme park tickets were sold for $960. Each adult ticket cost $12 and each child's ticket cost $9. Find the number of adult tickets and the number of children's tickets sold

Let the number of adult tickets be x and the number of children's tickets be y.

$x + y = 95$ — Eq. 1

$12x + 9y = 960$ — Eq. 2

Use Eq. 1 to express x in terms of y:

$x = 95 - y$ — Eq. 3

Substitute Eq. 3 into Eq. 2:

$12(95 - y) + 9y = 960$

$1{,}140 - 12y + 9y = 960$

$1{,}140 - 3y = 960$

$1{,}140 - 3y + 1{,}140 = 960 + 1{,}140$

$-3y = 2{,}100$

$\frac{-3y}{-3} = \frac{2{,}100}{-3}$

$y = 60$

Substitute 60 for y into Eq. 3:

$x = 95 - 60$

$x = 35$

There were 35 adult tickets and 60 children's tickets sold.

Finding Functions

Which table DOES NOT represent a function?

A)

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

C)

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

✔

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Calculate the missing length Y. Round to nearest tenth

$y^2 = (16 + 4)^2 + 12^2$

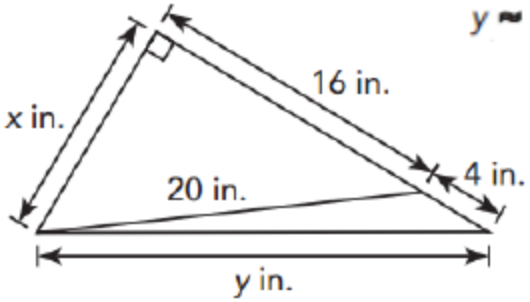
$y^2 = 20^2 + 12^2$

$y^2 = 400 + 144$

$y^2 = 544$

$y = \sqrt{544}$

$y \approx 23.3$



Lesson 6.2 Representing Functions Day 2

Objective

TSW represent a function in different forms including…

*Tables

***Algebraic Equation**

***Graphs**

A function is a relation between a set of inputs and a set of outputs, in which every input has exactly one output. You can use tables, graphs, and equations to represent many functions.

Common Core State Standards

8F1 Understand that a function is a rule that assigns to each input exactly one output. 8F4 Construct a function to model a linear relationship between two quantities 8F5 Describe qualitatively the functional relationship between two quantities by analyzing a graph…

Mathematical Practices *MP1 Solve problems/persevere MP2 Reason MP 4 Model Mathematics*

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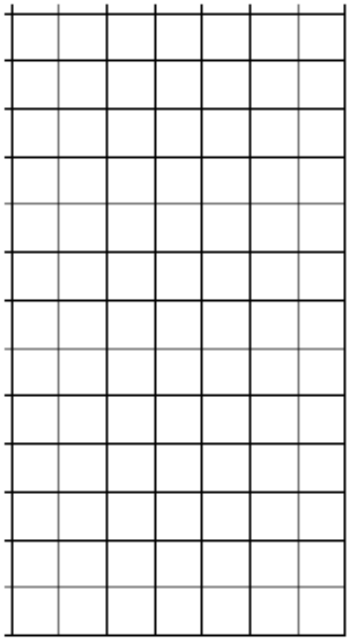
Example 6 **Translate a table of values for a function into a graph and an algebraic equation.**

Rachel starts cycling a distance away from her house at a constant rate. The table shows her distance from home, y meters, as a function of the time she takes to cycle, x seconds.

Time Taken (x seconds)	0	1	2	3	4	5
Distance from Home (y meters)	6	10	14	18	22	26

a) Graph the function. Use 1 unit on the horizontal axis to represent 1 second for the x interval from 0 to 5, and 1 unit on the vertical axis to represent 4 meters for the y interval from 6 to 26.



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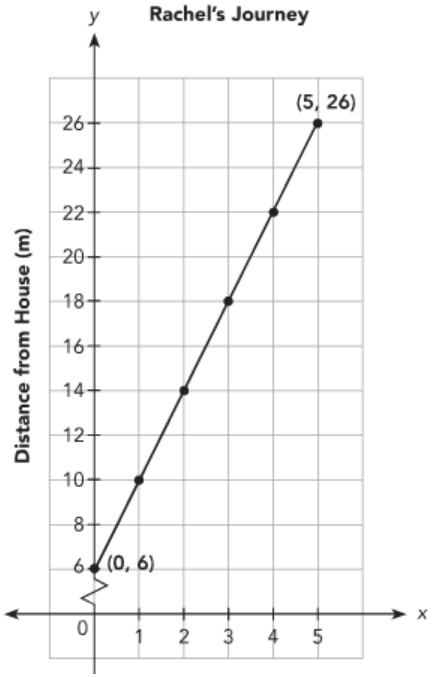

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b) Write an algebraic equation for the function.

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Solution

The line passes through the points (0, 6) and (5, 26).

Slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ Use the slope formula.

$= \frac{26 - 6}{5 - 0}$ Substitute values.

$= \frac{20}{5}$ Subtract.

$= 4$ Simplify.

Caution

Remember to subtract the coordinates of two points in the correct order when you find a slope.

Slope is not $\frac{x_2 - x_1}{y_2 - y_1}$ or $\frac{y_2 - y_1}{x_1 - x_2}$.

The line intersects the y-axis at the point (0, 6).
So, the y-intercept, b, is 6.

Slope-intercept form: $y = 4x + 6$ Substitute the values of m and b.

So, an equation of the line is $y = 4x + 6$.

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c) Describe how the slope and the *y*-intercept of the graph are related to the function.

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Solution

The *y*-intercept, 6, means that Rachel starts cycling when she is 6 meters away from her house. The slope, 4, gives the rate at which Rachel's distance from home is changing. For every second that passes, her distance from her house increases by 4 meters.

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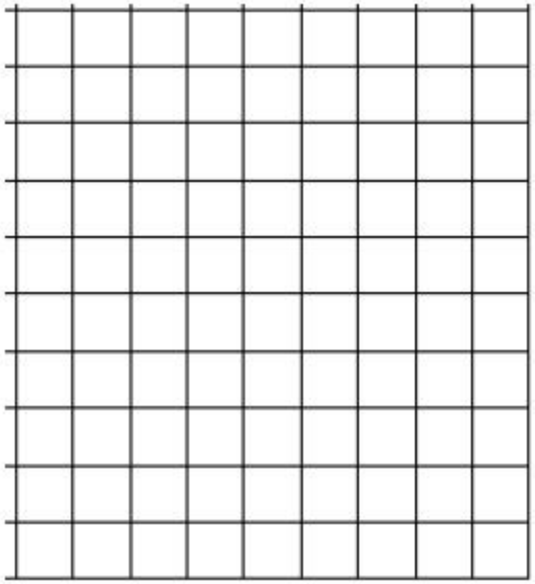
Guided Practice

Complete.

3 The table shows the total distance, y miles, indicated on the odometer of Jason's car and the amount of gasoline used, x gallons, on a particular day.

Amount of Gasoline (x gallons)	0	1	2	3	4	5
Total Distance (y miles)	1,000	1,030	1,060	1,090	1,120	1,150

a) Graph the function. Use 1 unit on the horizontal axis to represent 1 gallon for the x interval from 0 to 5, and 1 unit on the vertical axis to represent 30 miles for the y interval from 1,000 to 1,150.



Lesson 6.2 Representing Functions Day 1

b) Write an algebraic equation for the function.

c) Describe how the slope and the *y*-intercept of the graph are related to the function.

Lesson 6.2 Representing Functions Day 1

b) Write an algebraic equation for the function. $y = 30x + 1{,}000$

c) Describe how the slope and the *y*-intercept of the graph are related to the function.

Lesson 6.2 Representing Functions Day 2

Practice 6.2 #8-10

Name:_____ Date:_____

Practice 6.2

Write a verbal description of each function. Then write an algebraic equation for the function.

1. Gordon is traveling at a constant speed of 80 kilometers per hour. The distance he travels, d kilometers, is a function of the amount of time he takes to travel, t hours.

2. Mr. Henderson pays a monthly charge of $40 for a family cell phone plan. Each additional family member pays $10 every month. The total amount Mr. Henderson and his family members pay each month, y dollars, is a function of the number of the additional family members who use the plan, x.

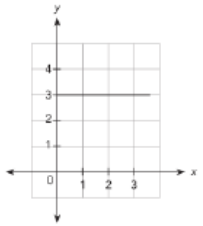
3. *Math Journal* In questions 1 and 2, tell whether all values for the input and output are meaningful for the functions. Explain.

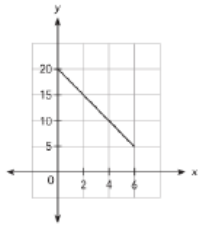
Write an algebraic equation for each function. Then construct a table of x- and y-values for the function.

4. The students from the Robotics Club are making model windmills for a workshop. Each windmill has three blades. The total number of blades needed, y, is a function of the number of windmills they make, x.

5. A newly made glass vase has a temperature of 580°C. Its temperature then decreases at an average rate of 56°C per minute. The temperature of the glass vase, y°C, is a function of the number of minutes its temperature has been decreasing, x.

Each of the following graphs represents a function. Write an algebraic equation to represent the function.

6. 

7. 

Challenge-

*Solve created equations

"Pick a Snowflake"

*Real World Problem (website)

*BuzzMath

Lesson Check #9-can represent a function as a graph

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Ticket Out the Door- Connect, Extend, Challenge

1. How are the ideas and information presented CONNECTED to what you already knew?

2. What new ideas did you get that EXTENDED or pushed your thinking in new directions?

3. What is still CHALLENGING or confusing for you to get your mind around? What questions, wonderings or puzzles do you now have?