

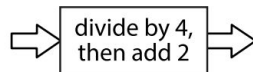
8th Grade Math Unit 5 Study Guide

How to use:

- Solve a sample problem aligned to each lesson
- If you get stuck, look at the Lesson Summary for the lesson to help guide your thinking linked [here](#)
- Check your answer against the answer key linked [here](#)
- Practice explaining how you solved the problem and why your process makes sense!

Lesson 1

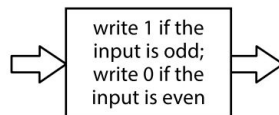
Given the rule:



Complete the table for the function rule for the following input values:

input	0	2	4	6	8	10
output						

Here is an input-output rule:



Complete the table for the input-output rule:

input	-3	-2	-1	0	1	2	3
output							

Lesson 2

A group of students is timed while sprinting 100 meters. Each student's speed can be found by dividing 100 m by their time. Is each statement true or false? Explain your reasoning.

- Speed is a function of time.
- Time is a function of distance.
- Speed is a function of number of students racing.
- Time is a function of speed.

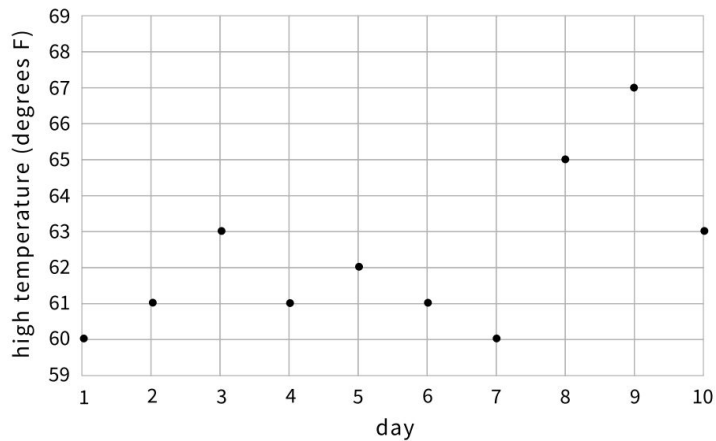
Lesson 3

Brown rice costs \$2 per pound, and beans cost \$1.60 per pound. Lin has \$10 to spend on these items to make a large meal of beans and rice for a potluck dinner. Let b be the number of pounds of beans Lin buys and r be the number of pounds of rice she buys when she spends all her money on this meal.

- Write an equation relating the two variables.
- Rearrange the equation so b is the independent variable.
- Rearrange the equation so r is the independent variable.

Lesson 4

The graph and the table show the high temperatures in a city over a 10-day period.

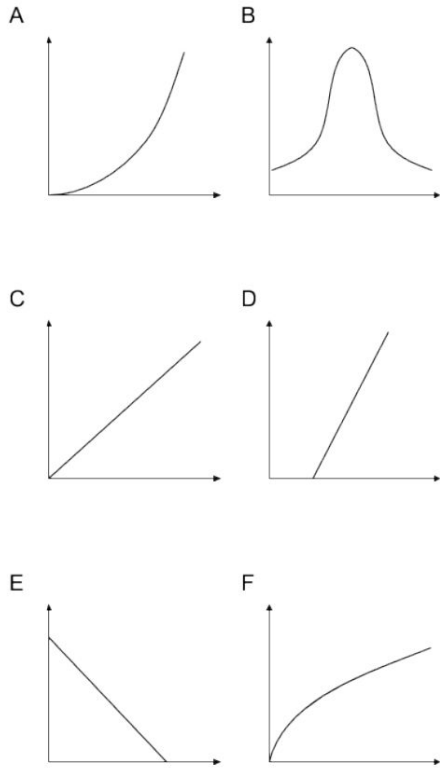


day	1	2	3	4	5	6	7	8	9	10
temperature (degrees F)	60	61	63	61	62	61	60	65	67	63

- What was the high temperature on Day 7?
- On which days was the high temperature 61 degrees?
- Is the high temperature a function of the day? Explain how you know.
- Is the day a function of the high temperature? Explain how you know.

Lesson 5

Match each diagram to the function described, then label the axes appropriately

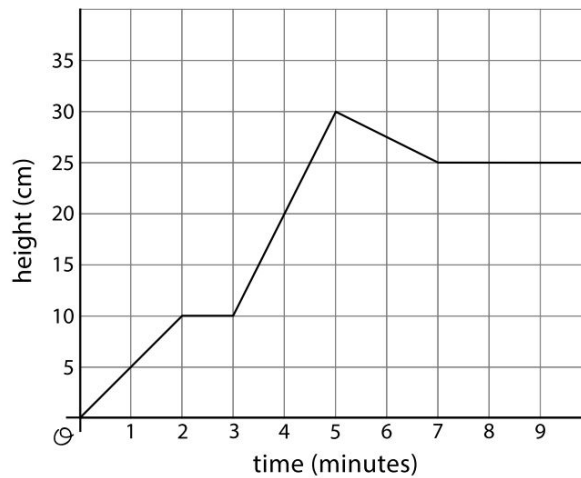


1. The function inputs the age of an oak tree a and outputs a prediction of the height of the tree h .
2. The function inputs the edge length e of a cube and outputs the volume v .
3. The function inputs the distance traveled d and predicts the amount of fuel left in the tank f .
4. The function inputs the height h of a triangle with base 12 and outputs the area a .
5. The function inputs the time of day t and predicts the temperature T .
6. The function inputs the time of day t and predicts the number of cars washed at a student car wash c .

Lesson 6

Jada fills her aquarium with water.

The graph shows the height of the water, in cm, in the aquarium as a function of time in minutes. Invent a story of how Jada fills the aquarium that fits the graph.



Lesson 7

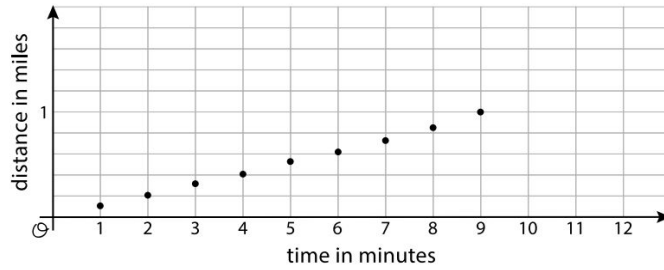
Elena and Lin are training for a race. Elena runs her mile a constant speed of 7.5 miles per hour.

Lin's times are recorded every minute:

time (minutes)	1	2	3	4	5	6	7	8	9
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distance (miles)	0.11	0.21	0.32	0.41	0.53	0.62	0.73	0.85	1
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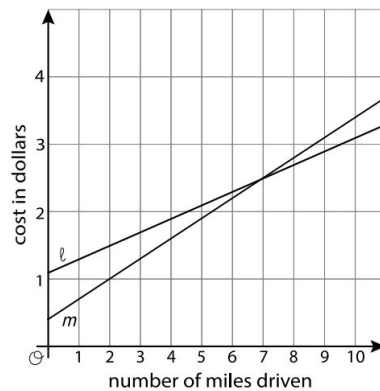
- Who finished their mile first?
- This is a graph of Lin's progress. Draw a graph to represent Elena's mile on the same axes.



- For these models, is distance a function of time? Is time a function of distance? Explain how you know.

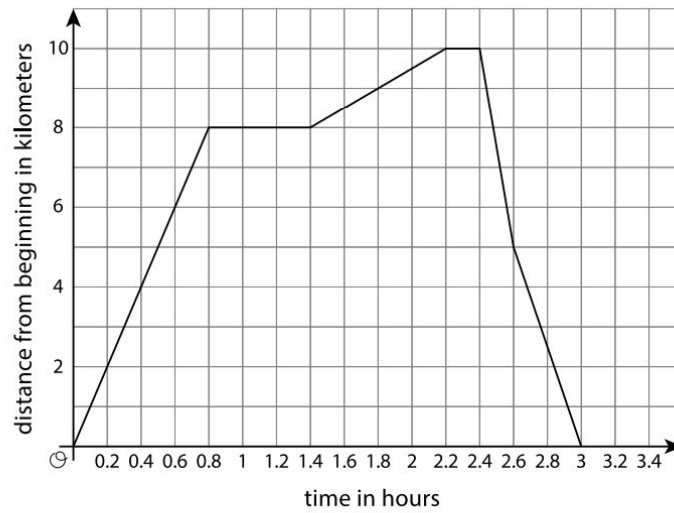
Lesson 8

Two car services offer to pick you up and take you to your destination. Service A charges 40 cents to pick you up and 30 cents for each mile of your trip. Service B charges \$1.10 to pick you up and charges c cents for each mile of your trip.



- Match the services to the Lines ℓ and m .
- For Service B, is the additional charge per mile greater or less than 30 cents per mile of the trip? Explain your reasoning.

Lesson 10

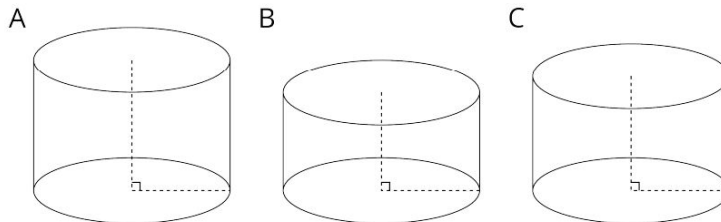


This graph shows a trip on a bike trail. The trail has markers every 0.5 km showing the distance from the beginning of the trail.

- When was the bike rider going the fastest?
- When was the bike rider going the slowest?
- During what times was the rider going away from the beginning of the trail?
- During what times was the rider going back towards the beginning of the trail?
- During what times did the rider stop?

Lesson 11

Cylinder A, B, and C have the same radius but different heights. Put the cylinders in order of their volume from least to greatest.



Lesson 12

- Sketch a cube and label its side length as 4 cm (this will be Cube A).
- Sketch a cube with sides that are twice as long as Cube A and label its side length (this will be Cube B).
- Find the volumes of Cube A and Cube B.

Lesson 13

Three cylinders have a height of 8 cm. Cylinder 1 has a radius of 1 cm. Cylinder 2 has a radius of 2 cm. Cylinder 3 has a radius of 3 cm. Find the volume of each cylinder.

Lesson 14

A cylinder has volume 45π and radius 3. What is its height?

Lesson 15

A cylinder and cone have the same height and radius. The height of each is 5 cm, and the radius is 2 cm. Calculate the volume of the cylinder and the cone.

Lesson 16

A cone has volume 3π .

- If the cone's radius is 1, what is its height?
- If the cone's radius is 2, what is its height?
- If the cone's radius is 5, what is its height?
- If the cone's radius is $\frac{1}{2}$, what is its height?
- If the cone's radius is r , then what is the height?

Lesson 17

A cylinder has a volume of $48\pi \text{ cm}^3$ and height h . Complete this table for volume of cylinders with the same radius but different heights.

height (cm)	volume (cm^3)
h	48π
$2h$	
$5h$	
$\frac{h}{2}$	
$\frac{h}{5}$	

Lesson 18

There are many cylinders with a height of 18 meters. Let r represent the radius in meters and V represent the volume in cubic meters.

- Write an equation that represents the volume V as a function of the radius r .
- Complete this table, giving three possible examples.

r	V
1	

- If the radius of a cylinder is doubled, does the volume double? Explain how you know.
- Is the graph of this function a line? Explain how you know.

