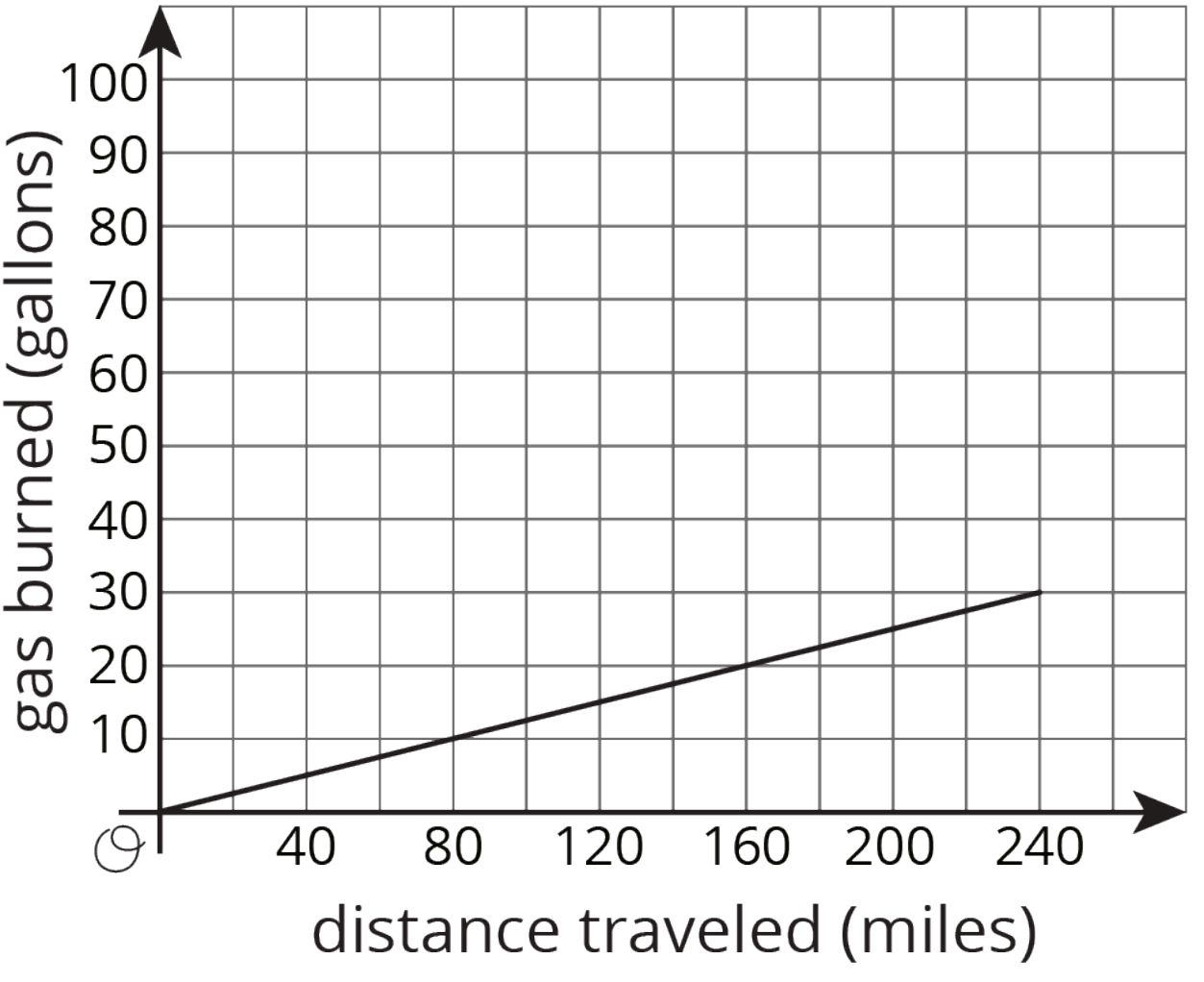
Unit 5 Lesson 17: Scaling One Dimension

1 Driving the Distance (Warm up)

Student Task Statement

Here is a graph of the amount of gas burned during a trip by a tractor-trailer truck as it drives at a constant speed down a highway:



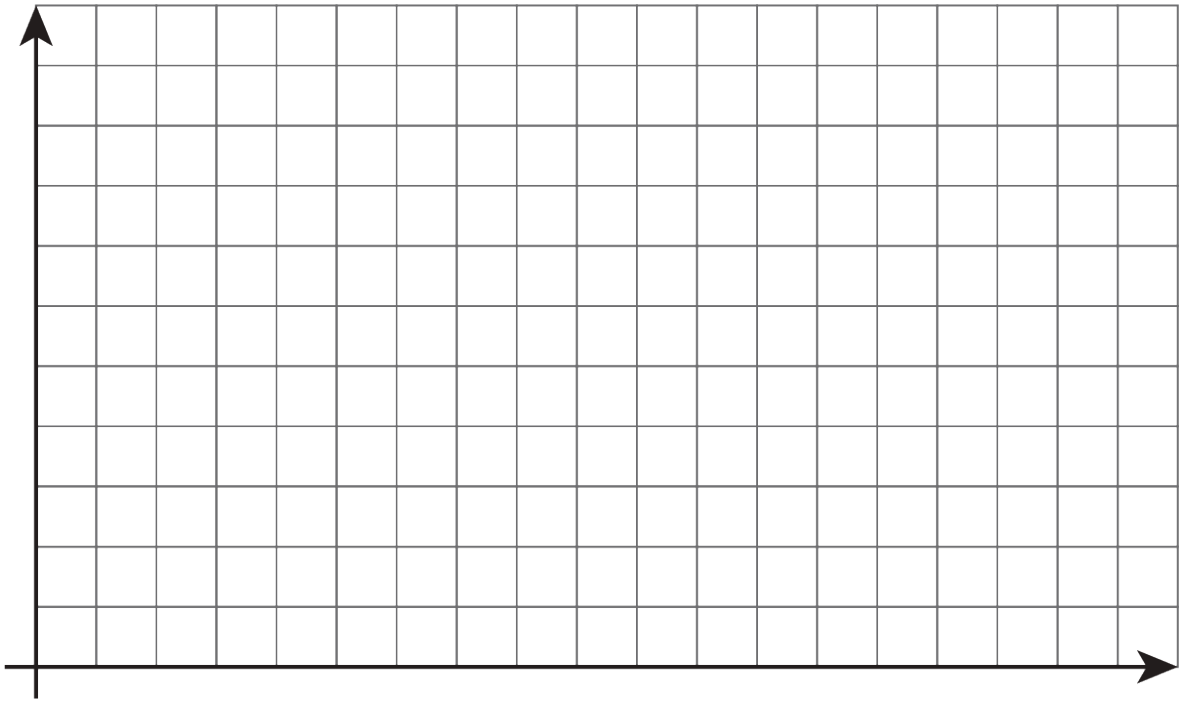
1. At the end of the trip, how far did the truck drive, and how much gas did it use?
2. If a truck traveled half this distance at the same rate, how much gas would it use?
3. If a truck traveled double this distance at the same rate, how much gas would it use?
4. Complete the sentence: _____ is a function of _____.

2 Double the Edge (Optional)

Student Task Statement

There are many right rectangular prisms with one edge of length 5 units and another edge of length 3 units. Let s represent the length of the third edge and V represent the volume of these prisms.

1. Write an equation that represents the relationship between V and s.
2. Graph this equation and label the axes.



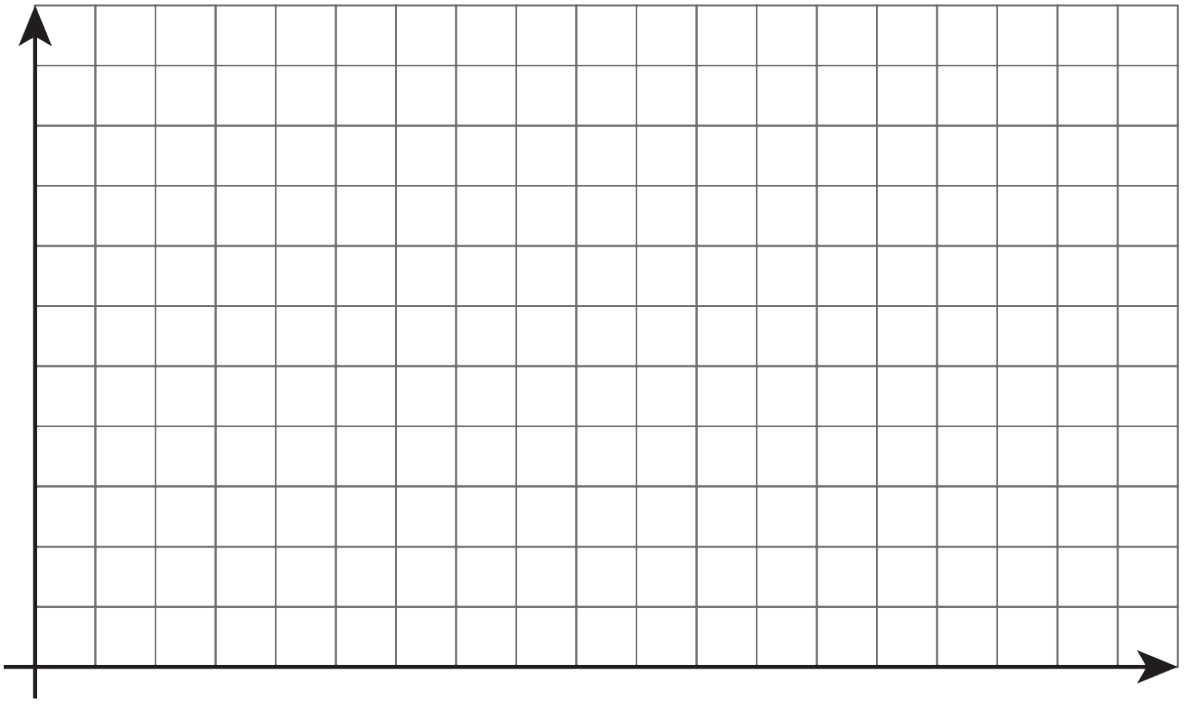
3. What happens to the volume if you double the edge length s? Where do you see this in the graph? Where do you see it algebraically?

3 Halve the Height (Optional)

Student Task Statement

There are many cylinders with radius 5 units. Let h represent the height and V represent the volume of these cylinders.

1. Write an equation that represents the relationship between V and h. Use 3.14 as an approximation of π.
2. Graph this equation and label the axes.

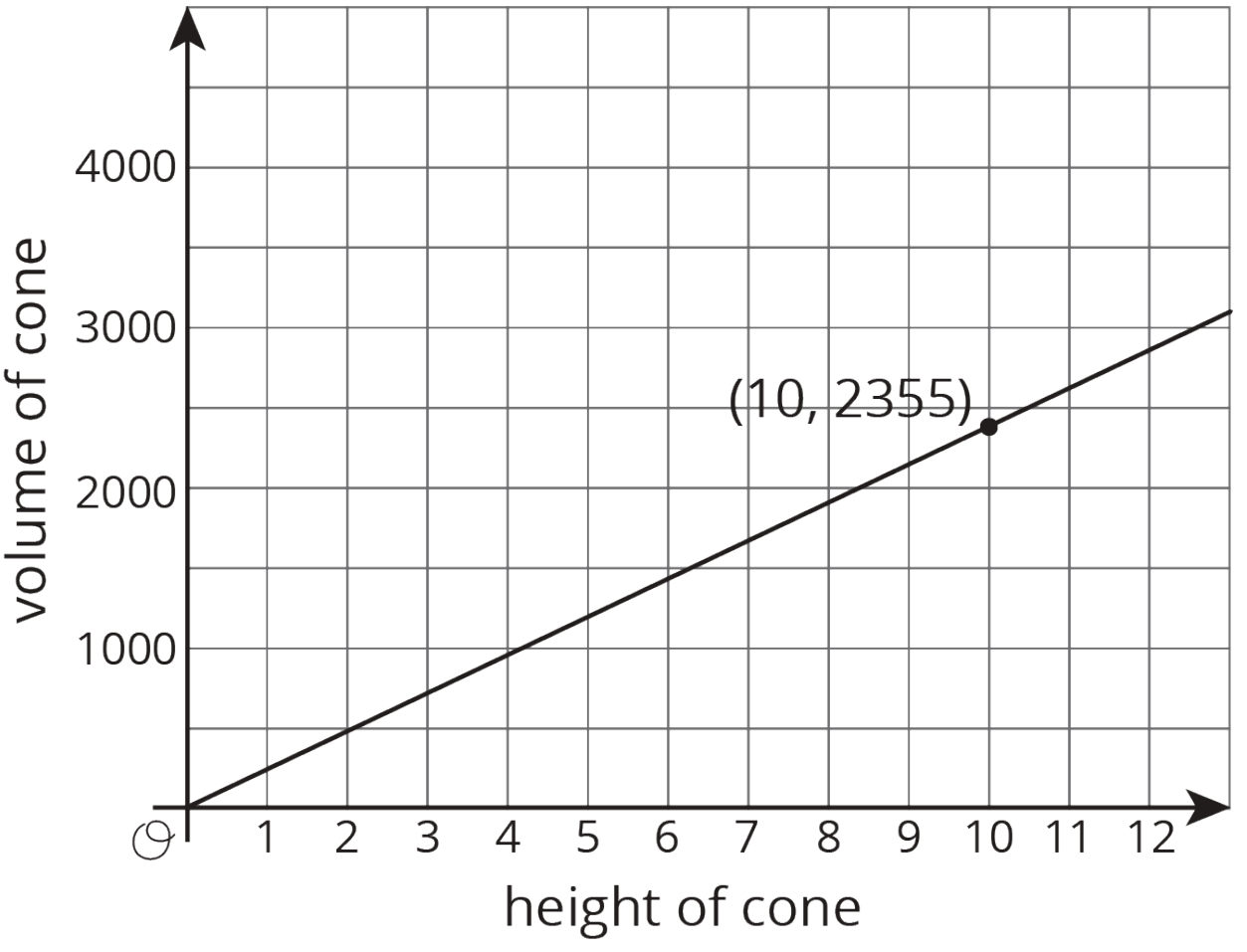


3. What happens to the volume if you halve the height, h? Where can you see this in the graph? How can you see it algebraically?

4 Figuring Out Cone Dimensions (Optional)

Student Task Statement

Here is a graph of the relationship between the height and the volume of some cones that all have the same radius:



1. What do the coordinates of the labeled point represent?
2. What is the volume of the cone with height 5? With height 30?
3. Use the labeled point to find the radius of these cones. Use 3.14 as an approximation for π.
4. Write an equation that relates the volume V and height h.