

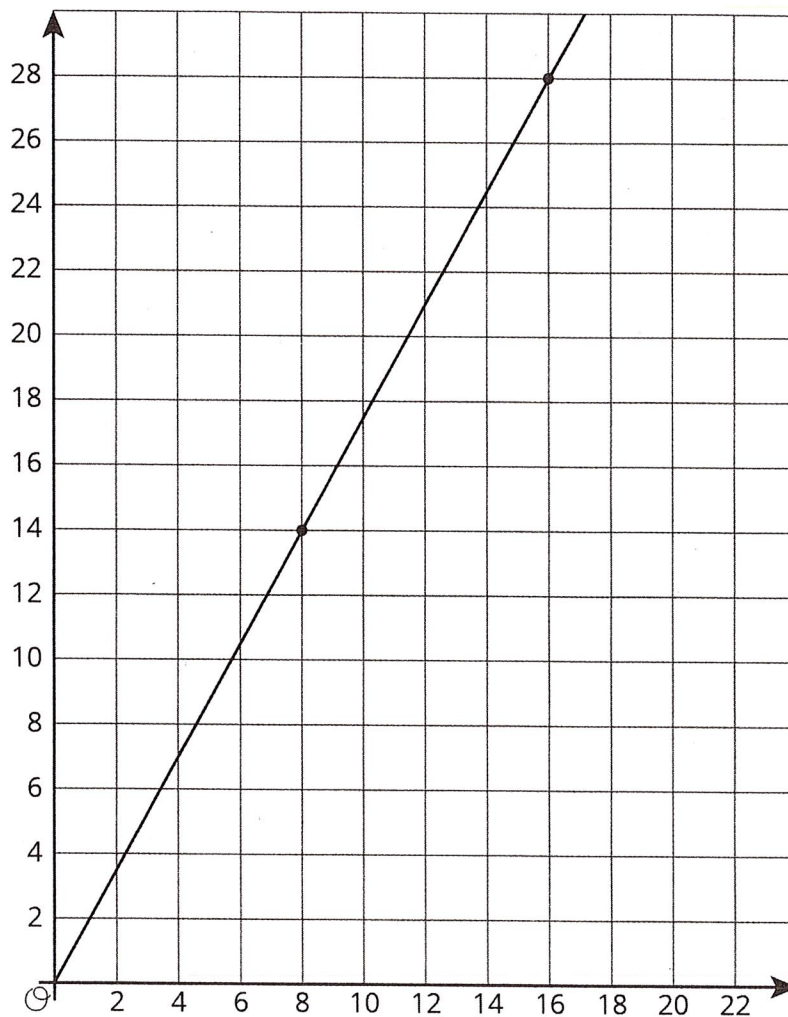
Unit 3

Lesson 2: Graphs of Proportional Relationships

Let's think about scale.

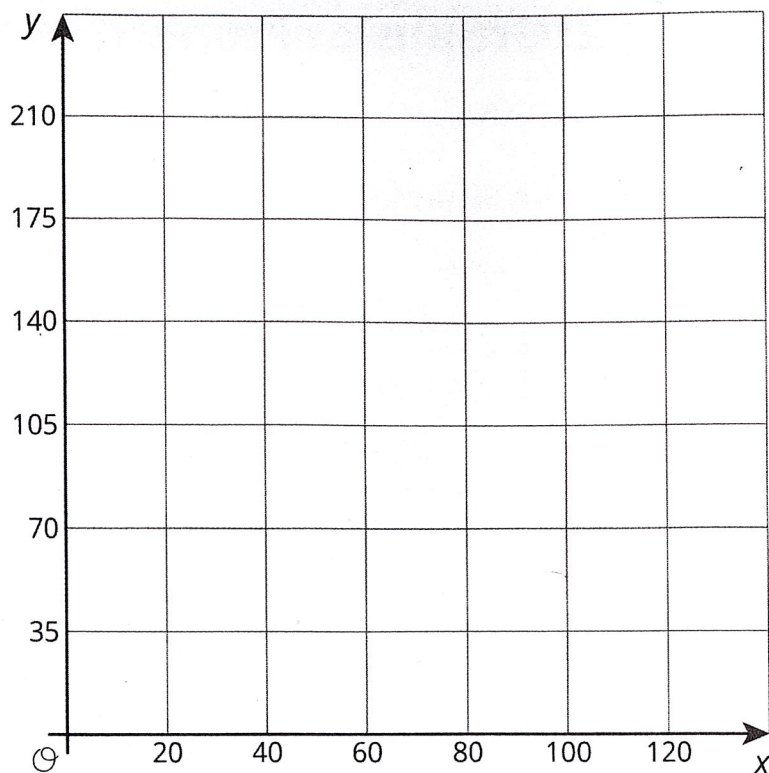
2.1: An Unknown Situation

Here is a graph that could represent a variety of different situations.



1. Write an equation for the graph.

2. Sketch a new graph of this relationship.



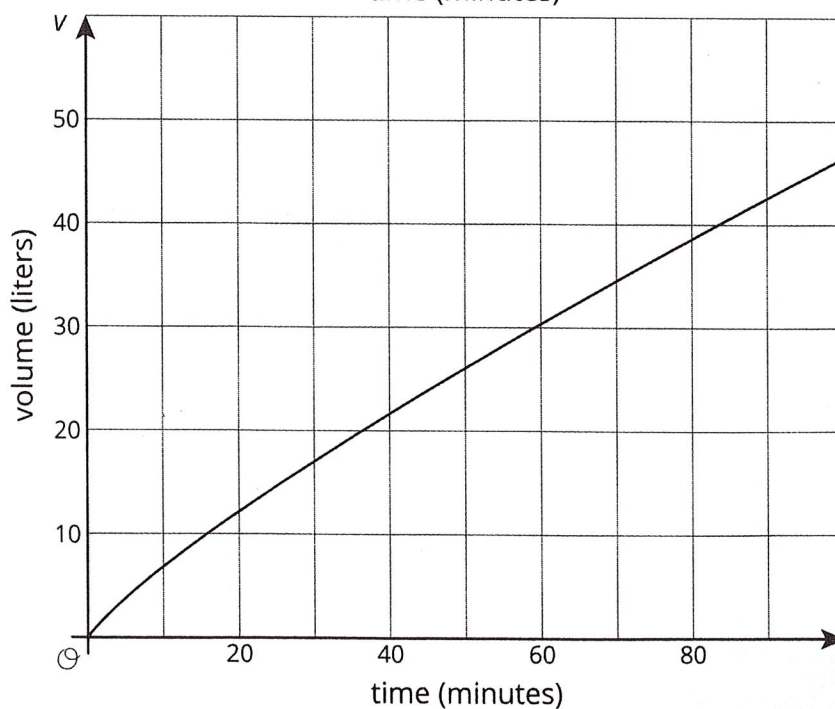
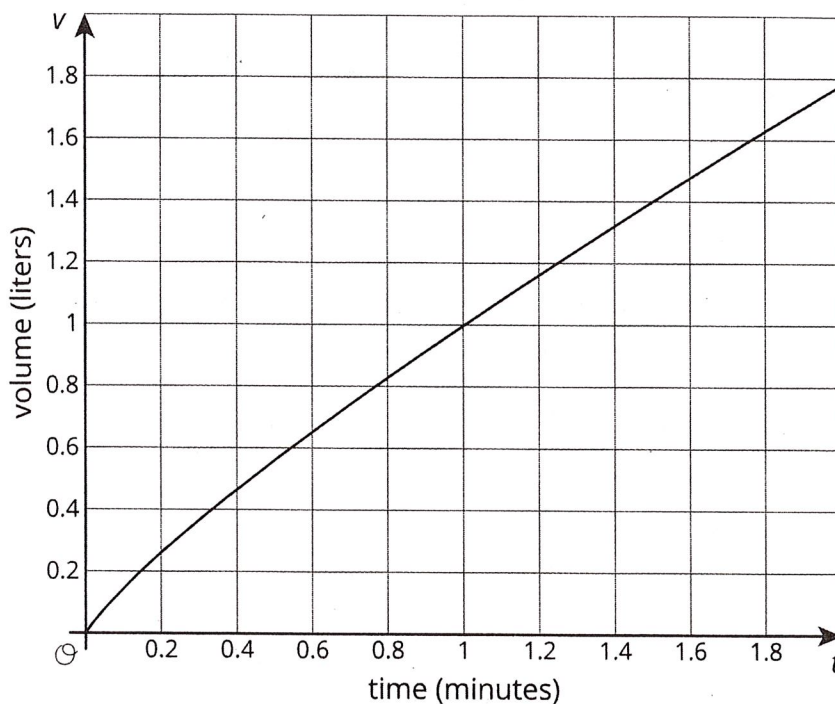
2.2: Card Sort: Proportional Relationships

You teacher will give you 12 graphs of proportional relationships.

1. Sort the graphs into groups based on what proportional relationship they represent.
2. Write an equation for each *different* proportional relationship you find.

2.3: Different Scales

Two large water tanks are filling with water. Tank A is not filled at a constant rate, and the relationship between its volume of water and time is graphed on each set of axes. Tank B is filled at a constant rate of $\frac{1}{2}$ liters per minute. The relationship between its volume of water and time can be described by the equation $v = \frac{1}{2}t$, where t is the time in minutes and v is the total volume in liters of water in the tank.



1. Sketch and label a graph of the relationship between the volume of water v and time t for Tank B on each of the axes.
2. Answer the following questions and say which graph you used to find your answer.
 - a. After 30 seconds, which tank has the most water?
 - b. At approximately what times do both tanks have the same amount of water?
 - c. At approximately what times do both tanks contain 1 liter of water? 20 liters?

Are you ready for more?

A giant tortoise travels at 0.17 miles per hour and an arctic hare travels at 37 miles per hour.

1. Draw separate graphs that show the relationship between time elapsed, in hours, and distance traveled, in miles, for both the tortoise and the hare.
2. Would it be helpful to try to put both graphs on the same pair of axes? Why or why not?
3. The tortoise and the hare start out together and after half an hour the hare stops to take a rest. How long does it take the tortoise to catch up?

Unit 3
Lesson 2 Summary

The scales we choose when graphing a relationship often depend on what information we want to know. For example, say two water tanks are filled at different constant rates. The relationship between time in minutes t and volume in liters v of tank A is given by $v = 2.2t$. For tank B the relationship is $v = 2.75t$.