Lesson Summary

Measures of one type of quantity are *proportional to* measures of a second type of quantity if there is a number k so that for every measure x of a quantity of the first type, the corresponding measure y of a quantity of the second type is given by kx; that is, $y = kx$. The number k is called the *constant of proportionality*.

A *proportional relationship* is a correspondence between two types of quantities such that the measures of quantities of the first type are proportional to the measures of quantities of the second type.

Note that proportional relationships and ratio relationships describe the same set of ordered pairs but in two different ways. Ratio relationships are used in the context of working with equivalent ratios, while proportional relationships are used in the context of rates.

In the example given below, the distance is *proportional to* time since each measure of distance, y, can be calculated by multiplying each corresponding time, t, by the same value, 10. This table illustrates a *proportional relationship* between time, t, and distance, y.

Time (h), t	0	1	2	3
Distance (km), y	0	10	20	30

Problem Set

1. A cran-apple juice blend is mixed in a ratio of cranberry to apple of 3 to 5.

   a. Complete the table to show different amounts that are proportional.

Amount of Cranberry			
Amount of Apple			

   b. Why are these quantities proportional?

2. John is filling a bathtub that is 18 inches deep. He notices that it takes two minutes to fill the tub with three inches of water. He estimates it will take 10 more minutes for the water to reach the top of the tub if it continues at the same rate. Is he correct? Explain.