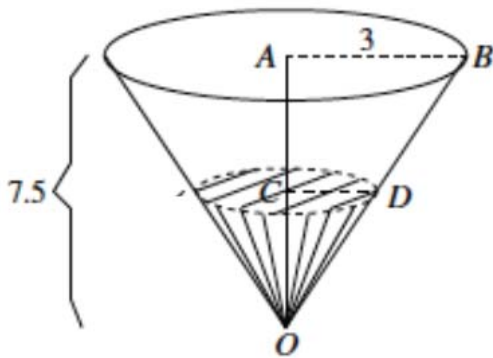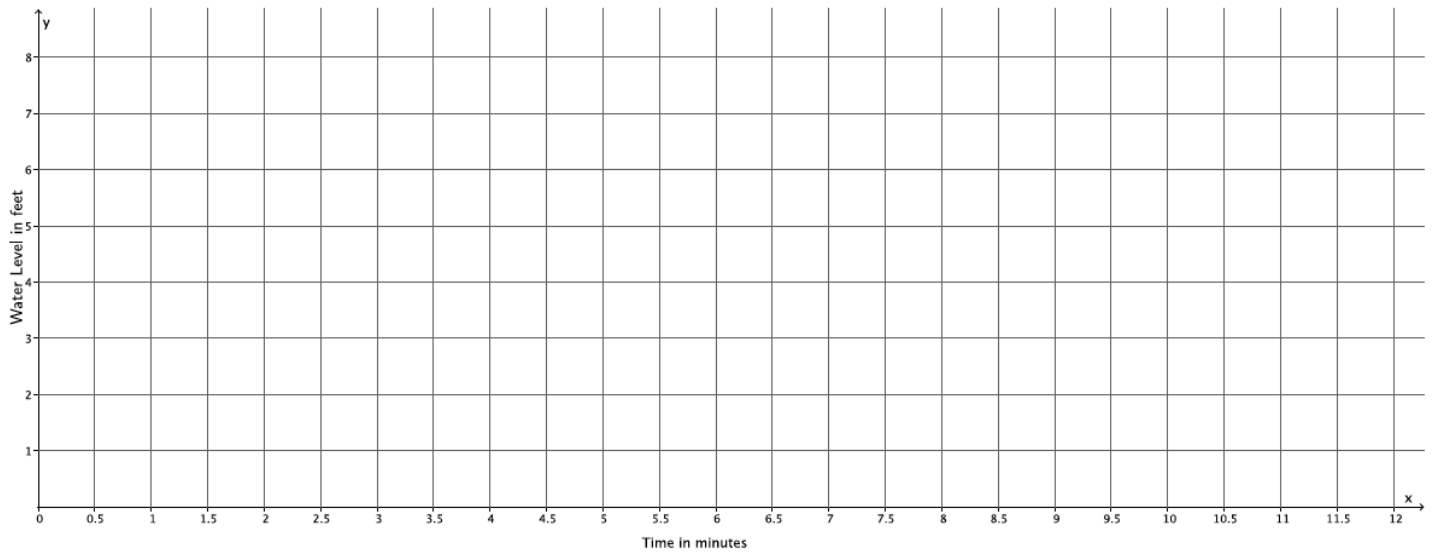# Lesson 22: Average Rate of Change

Classwork

Exercise

The height of a container in the shape of a circular cone is 7.5 ft., and the radius of its base is 3 ft., as shown. What is the total volume of the cone?
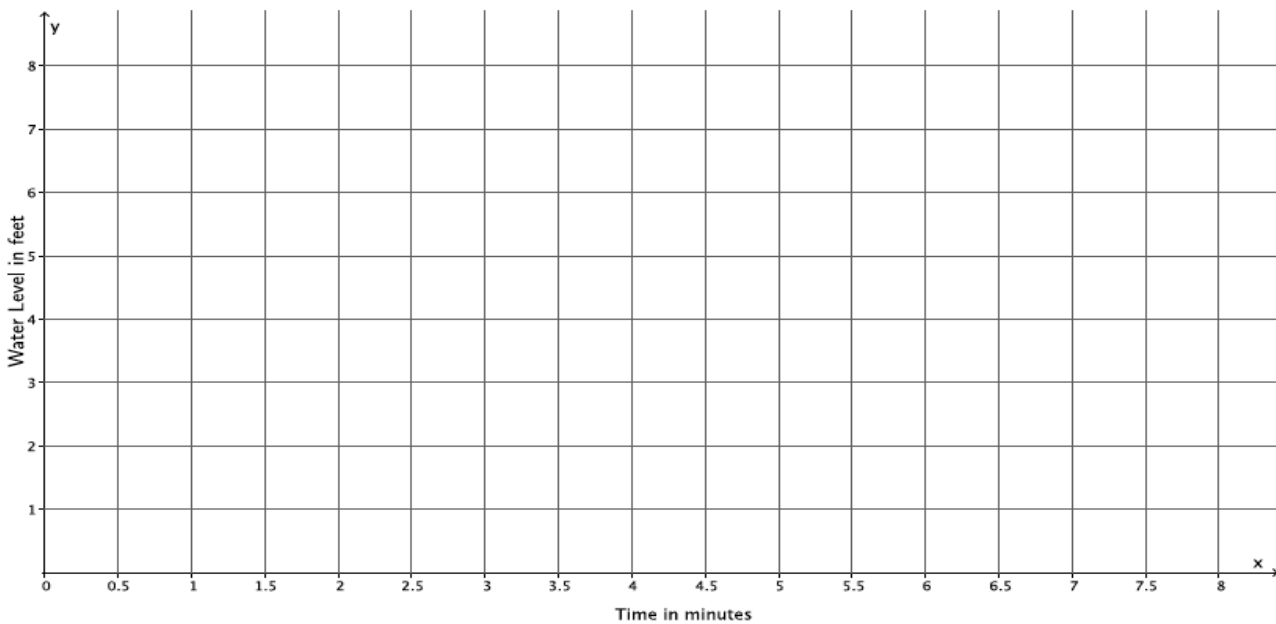
| Time in minutes	Water level in feet
	1
	2
	3
	4
	5
	6
	7
	7.5

Problem Set

1. Complete the table below for more intervals of water levels of the cone discussed in class. Then graph the data on a coordinate plane.

| Time in minutes	Water level in feet
	1
	1.5
	2
	2.5
	3
	3.5
	4
	4.5
	5
	5.5
	6
	6.5
	7
	7.5

2. Complete the table below and graph the data on a coordinate plane. Compare the graphs from Problems 1 and 2. What do you notice? If you could write a rule to describe the function of the rate of change of the water level of the cone, what might the rule include?

x	$\sqrt{x}$
1	
4	
9	
16	
25	
36	
49	
64	
81	
100	
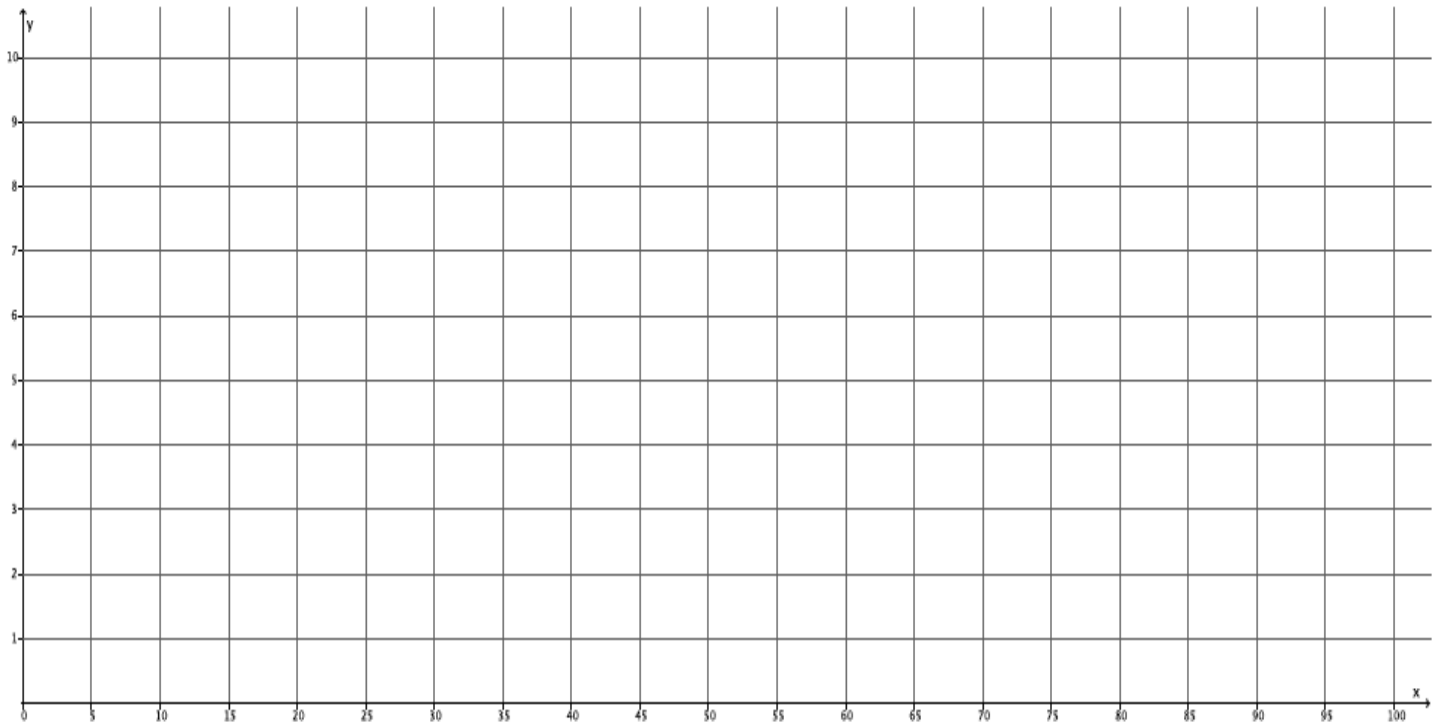
3.   Describe, intuitively, the rate of change of the water level if the container being filled were a cylinder. Would we get the same results as with the cone? Why or why not? Sketch a graph of what filling the cylinder might look like, and explain how the graph relates to your answer.
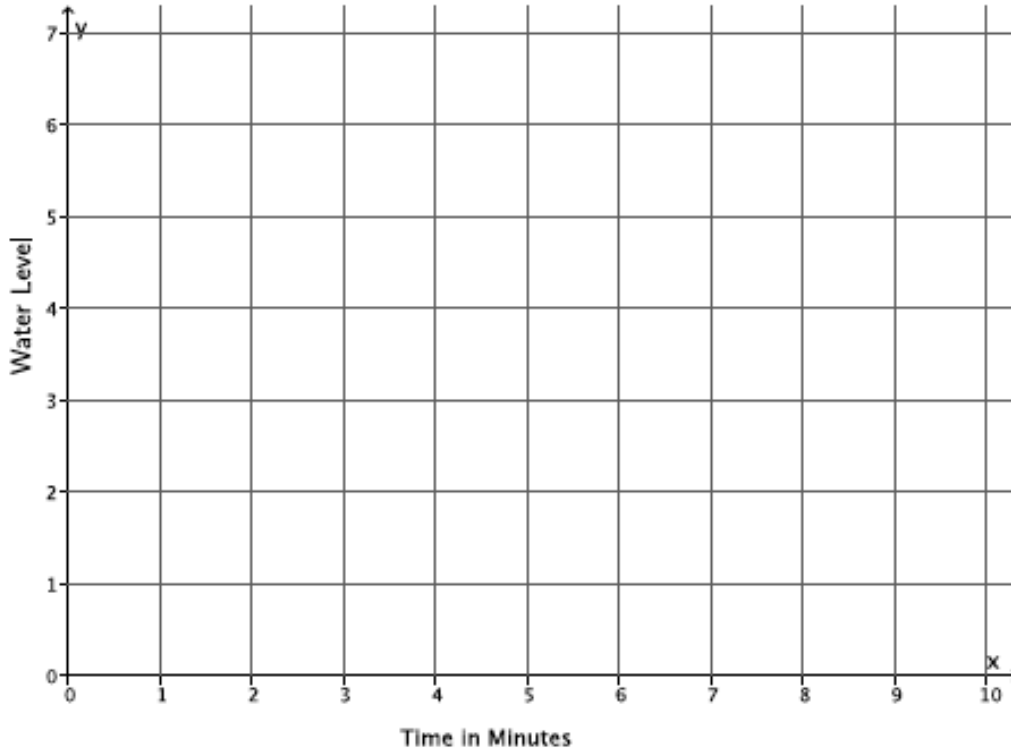
4.   Describe, intuitively, the rate of change if the container being filled were a sphere. Would we get the same results as with the cone? Why or why not?