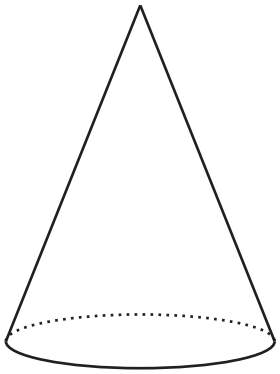
# Filling Containers

Let's fill containers with water.

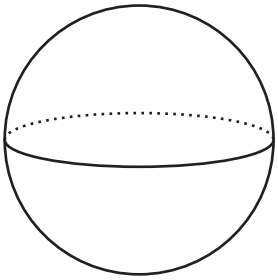
## 11.1 Which Three Go Together: Solids

Which three go together? Why do they go together?

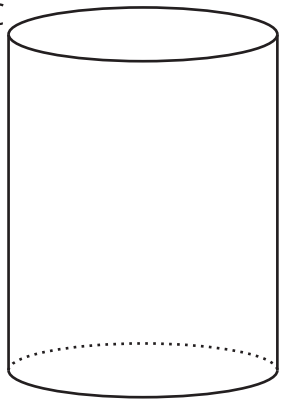
A



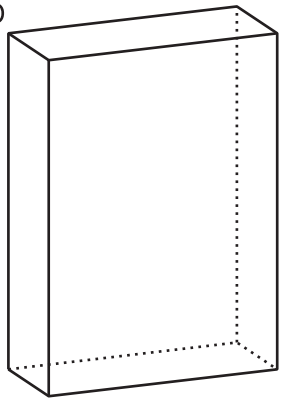
B



C



D




CC BY NC Illustrative Mathematics, based on IM 6–8 Math, CC BY Open Up Resources.

# 11.2 Height and Volume

Your teacher will give you a graduated cylinder, water, and some other supplies. Your group will use these supplies to investigate the height of water in the cylinder as a function of the water volume.

1. Before you get started, make a prediction about the shape of the graph.

2. Fill the cylinder with different amounts of water and record the data in the table.

| volume (ml) | | | | | | |
|---|---|---|---|---|---|---|
| height (cm) | | | | | | |

3. Create a graph that shows the height of the water in the cylinder as a function of the water volume.



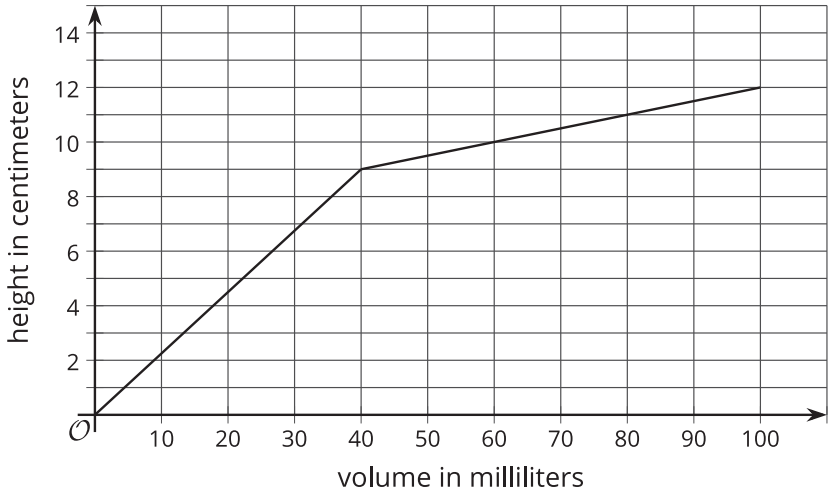
4. Choose a point on the graph and explain its meaning in the context of the situation.


CC BY NC Illustrative Mathematics, based on IM 6–8 Math, CC BY Open Up Resources.

# 11.3 What Is the Shape?

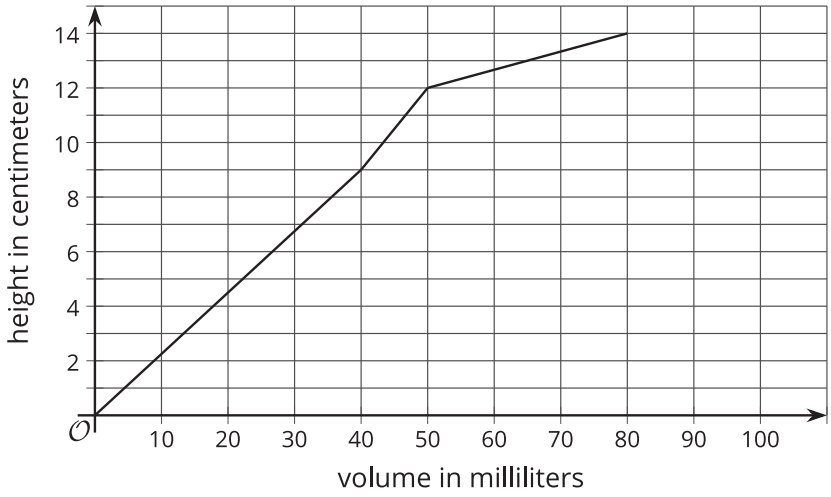
1. The graph shows the height vs. volume function of an unknown container.

   What shape could this container have? Explain how you know, and draw a possible container.




2. The graph shows the height vs. volume function of a different unknown container.

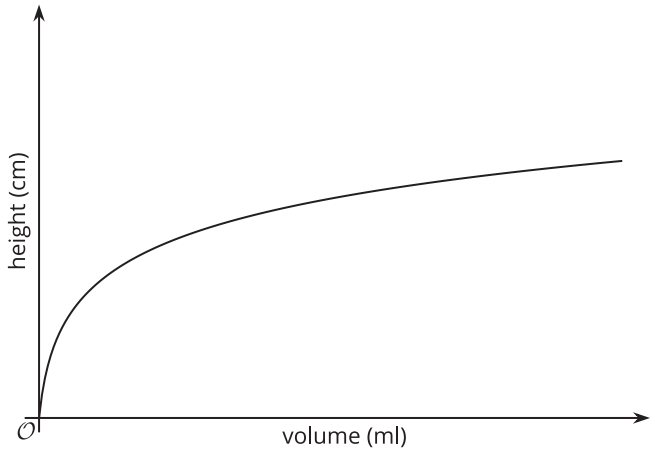
   What shape could this container have? Explain how you know, and draw a possible container.




3. How are the two containers similar? How are they different?

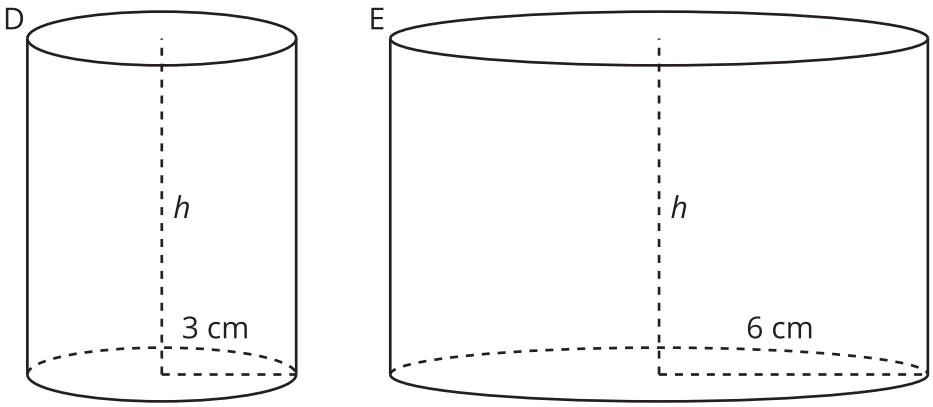
## Are you ready for more?

The graph shows the height vs. volume function of an unknown container. What shape could this container have? Explain how you know, and draw a possible container.




## Lesson 11 Summary

When filling a shape like a cylinder with water, we can see how the dimensions of the cylinder affect things like the changing height of the water. For example, let's say we have two cylinders, D and E, with the same height, but D has a radius of 3 cm, and E has a radius of 6 cm.




If we pour water into both cylinders at the same rate, the height of water in D will increase faster than the height of water in E because of its smaller radius. This means that if we made graphs of the height of water as a function of the volume of water for each cylinder, we would have two lines, and the slope of the line for Cylinder D would be greater than the slope of the line for Cylinder E.


CC BY NC Illustrative Mathematics, based on IM 6–8 Math, CC BY Open Up Resources.