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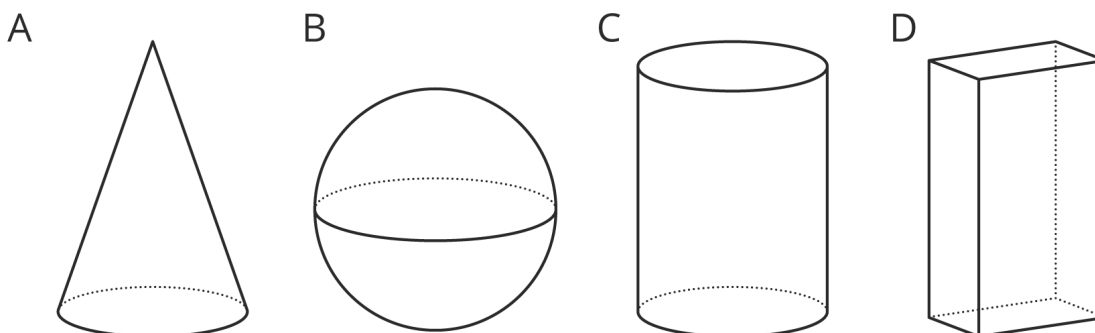
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Unit 5, Lesson 11: Filling containers

Let's fill containers with water.

11.1: Which One Doesn't Belong: Solids

These are drawings of three-dimensional objects. Which one doesn't belong? Explain your reasoning.



11.2: Height and Volume

m.openup.org/1/8-5-11-2



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)						

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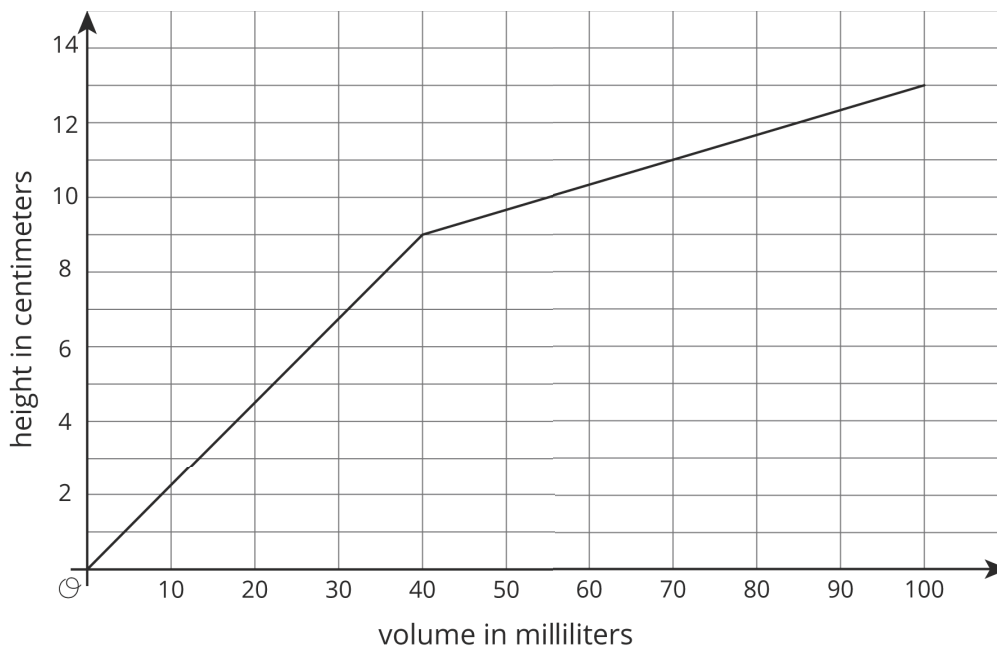
3. Create a graph that shows the height of the water in the cylinder as a function of the water volume.



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

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.

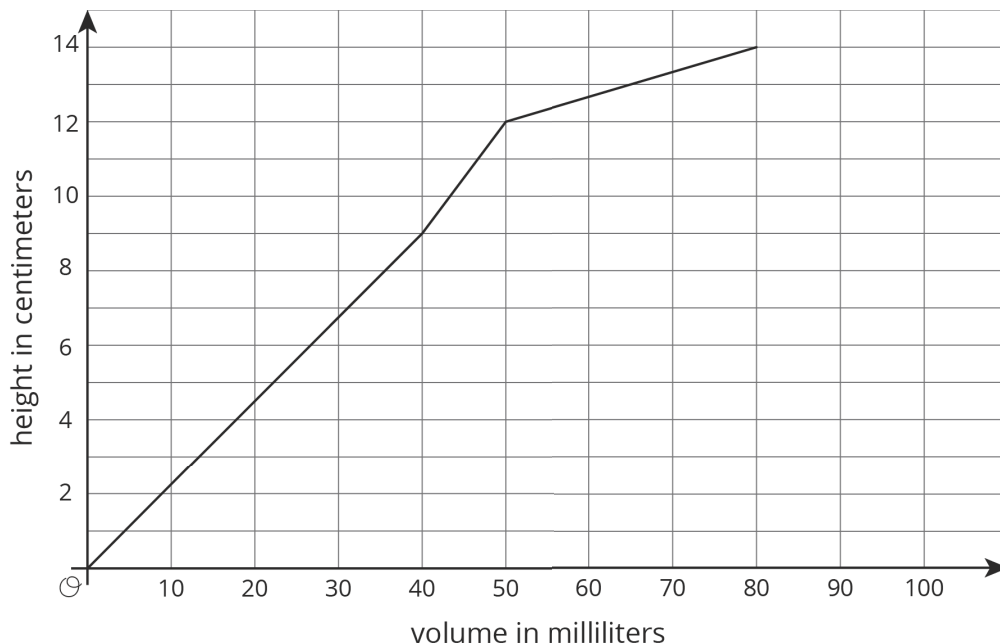


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2. The graph shows the height vs. volume function of a different unknown container. What shape could this container have? Explain how you know and draw a possible container.



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

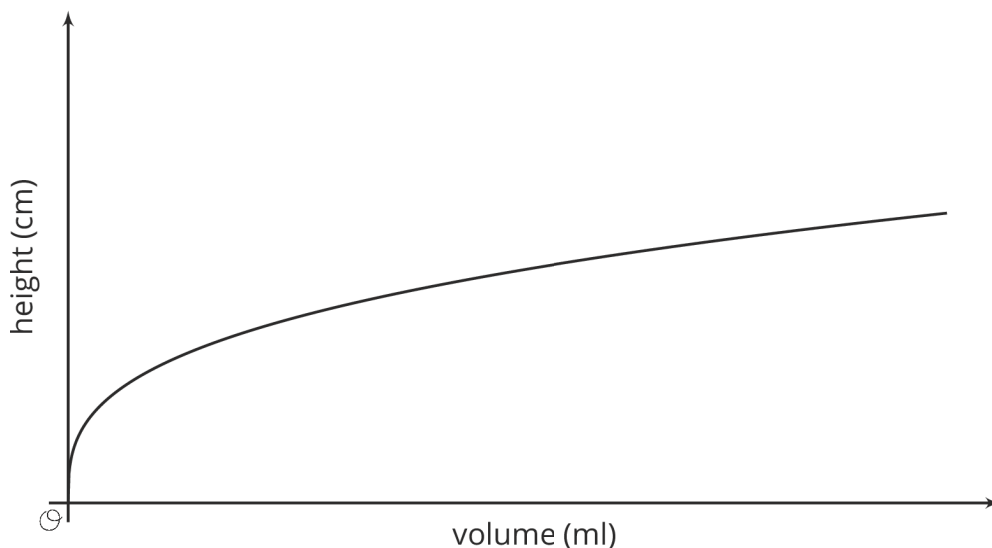
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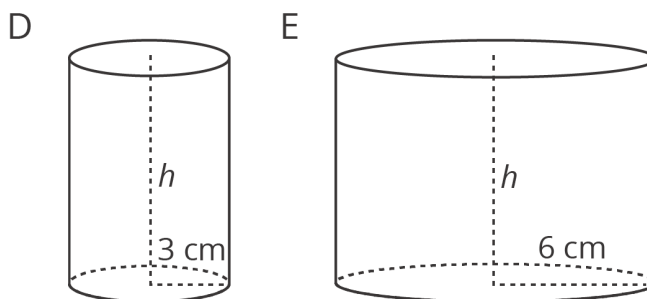
Are you ready for more?

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* due to 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*.

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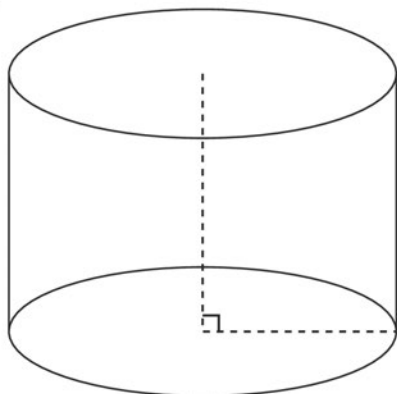
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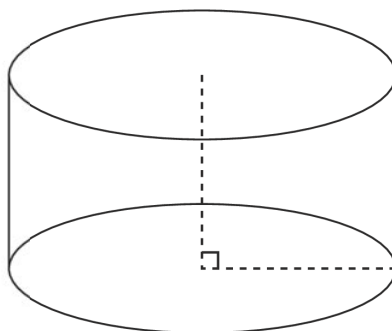
Unit 5, Lesson 11: Filling containers

1. Cylinder A, B, and C have the same radius but different heights. Put the cylinders in order of their volume from least to greatest.

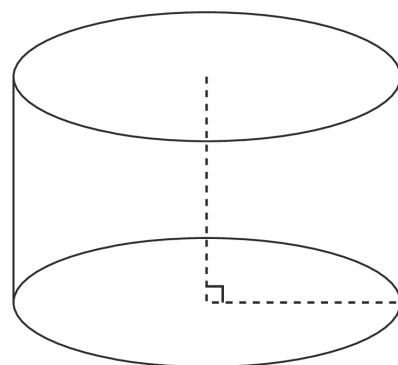
A



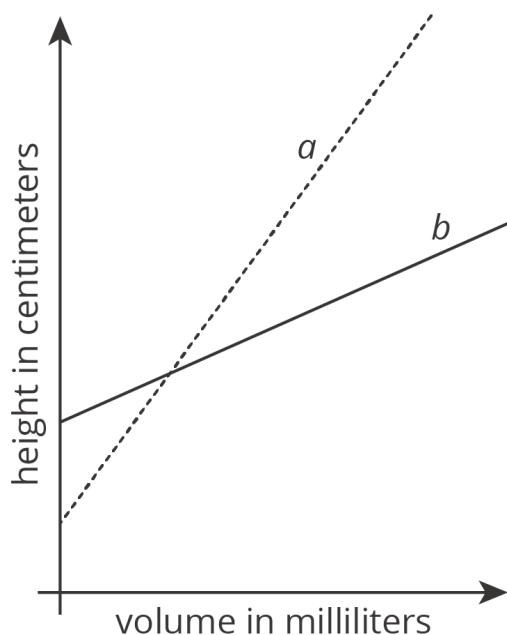
B



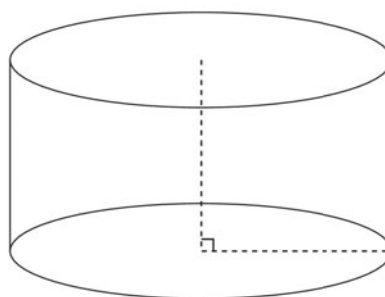
C



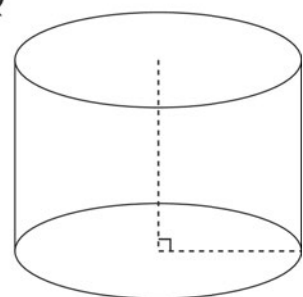
2. Two cylinders, a and b , each started with different amounts of water. The graph shows how the height of the water changed as the volume of water increased in each cylinder. Match the graphs of a and b to Cylinders P and Q. Explain your reasoning.



P



Q

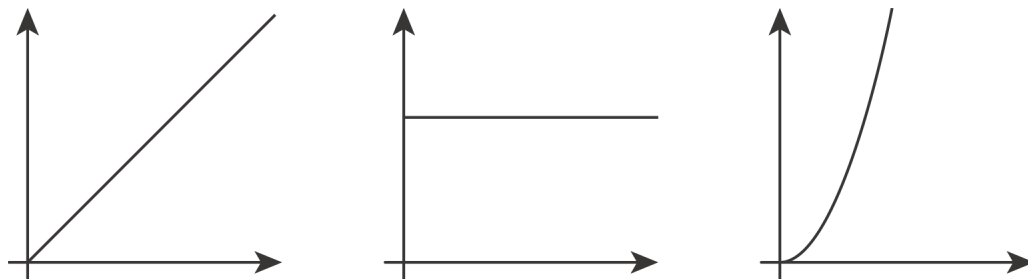


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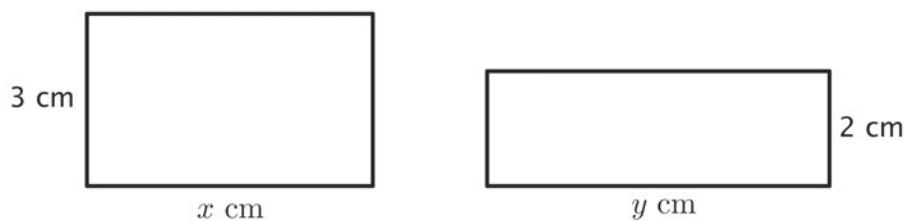
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3. Which of the following graphs could represent the volume of water in a cylinder as a function of its height? Explain your reasoning.



4. Together, the areas of the rectangles sum to 30 square centimeters.



a. Write an equation showing the relationship between x and y .

b. Fill in the table with the missing values.

x	3		8		12
y		5		10	

(from Unit 5, Lesson 3)