

Section 15.1

NAME: _____ Period _____ 1

1. Describe the solid that is formed by rotating each of these figures about line *m* and sketch it.

a)



Name/Description

b)



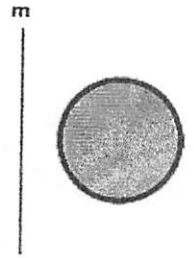
Name/Description

c)



Name/Description

d)



Name/Description

e)



Name/Description

f)



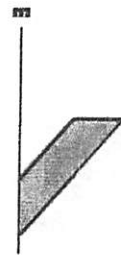
Name/Description

g)



Name/Description

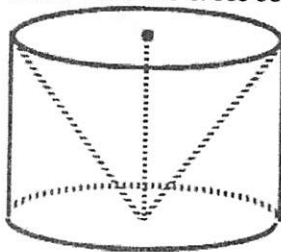
h)



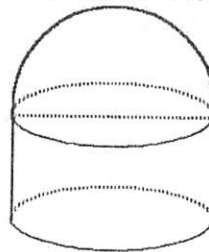
Name/Description

2. Determine the rotational cross section

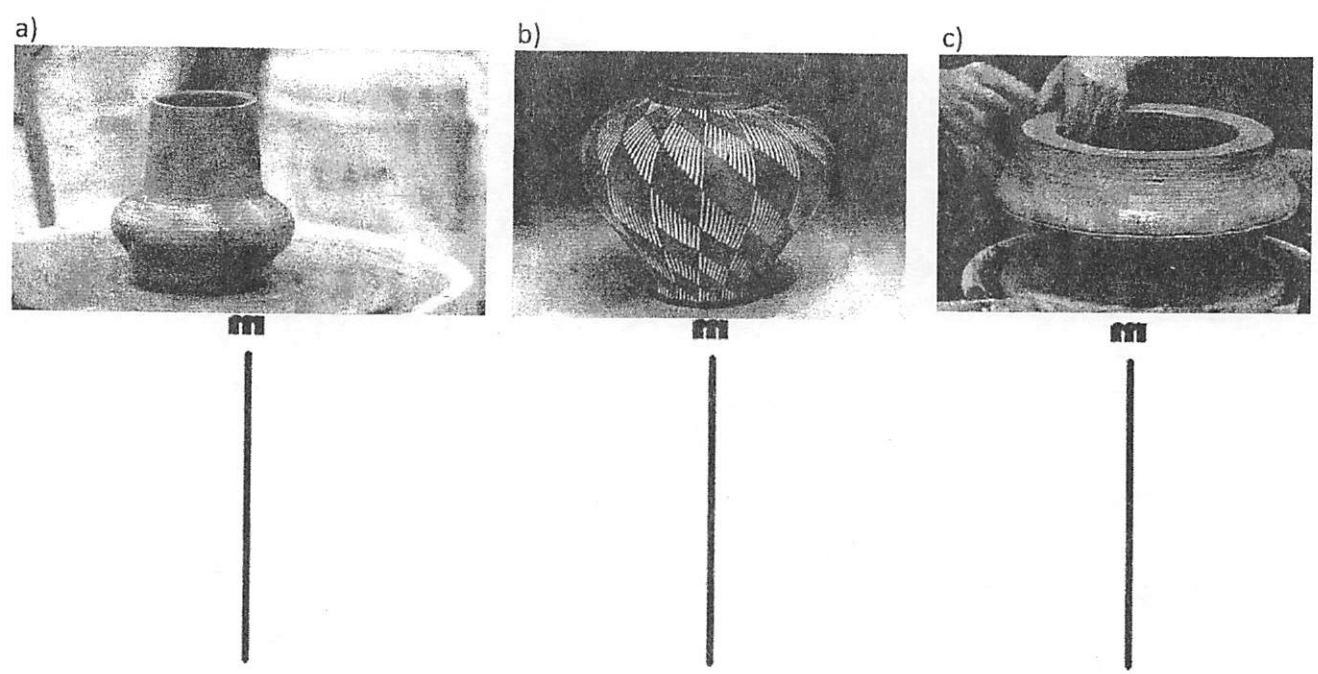
a) A cylinder has a cone subtracted from its volume. What does the cross section look like?



b) A hemisphere on a cylinder. What does the cross section look like?



3. A potter creates pots and bowls using a pottery wheel. The wheel spins and the potter shapes the clay. From these three pictures, create the rotational cross section.

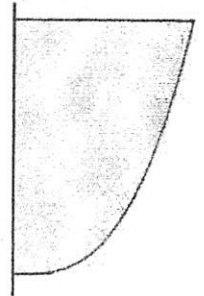


4. a) Use the rotational cross section to sketch the solid.



SKETCH OF SOLID

b) Use the rotational cross section to sketch the solid.



SKETCH OF SOLID

Use the website <http://www.shodor.org/interactivate/activities/3DTransmographer>

Question 1: The Right Triangle

Create a Polygon with 3 vertices. Use the following points as the vertices.

(9, 0) (0, 0) (0, 10)

Click the “Graph” button to graph the polygon.

A. Predict and sketch what three-dimensional shape will be formed when you rotate the right triangle around the y-axis and x-axis.

B. Under the “Revolve” box, click the last button that says, “across $x = 0$.” Then, click the “Revolve” button. What three-dimensional figure is formed by rotating the right triangle around the y-axis? Was your prediction accurate? Explain your reasoning and sketch a picture.

C. Under the “Revolve” box, click the first button that says, “across $y = 0$.” Then, click the “revolve” button. What three-dimensional figure is formed by rotating the right triangle around the x-axis? Sketch a picture.

Question 2: The Rectangle

Create a Polygon with 4 vertices. Use the following points as the vertices.

(10, 0) (10, 6) (0, 6) (0, 0)

A. Predict and sketch what three-dimensional shape will be formed when you rotate the rectangle around the y-axis and the x-axis.

B. What three-dimensional figure is formed by rotating the rectangle around the y-axis? Was your prediction accurate? Explain your reasoning and sketch a picture.

C. What three-dimensional figure is formed by rotating the rectangle around the x-axis? Sketch a picture.

Question 3: The Trapezoid

Create a Polygon with 4 vertices. Use the following points as the vertices.

(10, 0) (4, 8) (0, 8) (0, 0)

Click the "Graph" button to graph the polygon.

A. Predict and sketch what three-dimensional shape will be formed when you rotate the trapezoid around the y -axis and the x -axis.

B. What three-dimensional figure is formed by rotating the trapezoid around the y -axis? Was your prediction accurate? Explain your reasoning and sketch a picture.

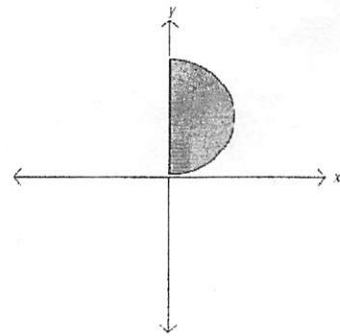
C. What three-dimensional figure is formed by rotating the trapezoid around the x -axis? Was your prediction accurate? Explain your reasoning and sketch a picture.

Question 4: The Semicircle

Given the semicircle to the right.

A. What three-dimensional figure is formed when the semicircle is rotated around the y -axis?

B. What three-dimensional figure is formed when the semicircle is rotated around the x -axis?



Question 5: Working Backwards

A. What two-dimensional figure is rotated around the x -axis to form a cone?

B. What two-dimensional figure is rotated around the y -axis to form a hemisphere?

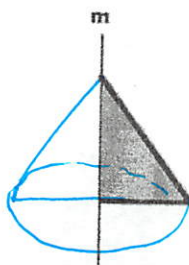
Question 6: Summary

A. What two-dimensional figure would you rotate and around which axis to make an upside down cone? Identify the figure and sketch the picture.

B. Create a three-dimensional figure and describe what two-dimensional shape you rotated to form your figure.

1. Describe the solid that is formed by rotating each of these figures about line m and sketch it.

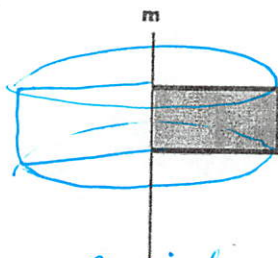
a)



Cone

Name/Description

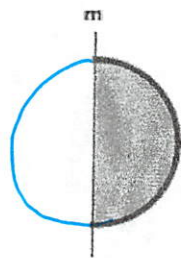
b)



Cylinder

Name/Description

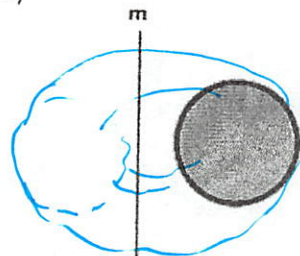
c)



Sphere

Name/Description

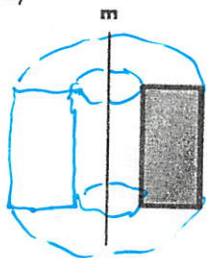
d)



Donut

Name/Description

e)

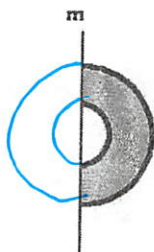


Cylinder

Name/Description

with hollow center

f)



Sphere

Name/Description

w/ hollow center

g)

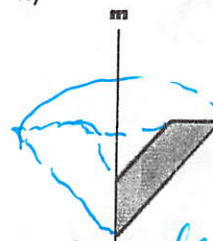


Cylinder

Name/Description

w/ cone on top

h)

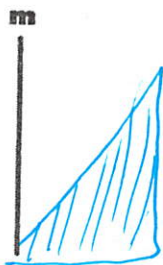
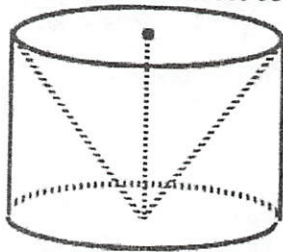


Upside down Cone w/ hollow top

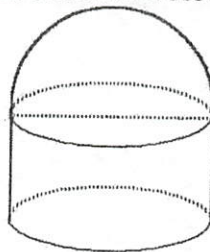
Name/Description

2. Determine the rotational cross section

a) A cylinder has a cone subtracted from its volume. What does the cross section look like?

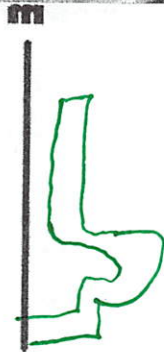


b) A hemisphere on a cylinder. What does the cross section look like?

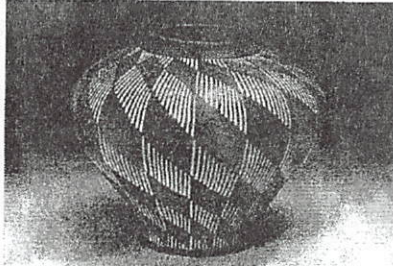


3. A potter creates pots and bowls using a pottery wheel. The wheel spins and the potter shapes the clay. From these three pictures, create the rotational cross section.

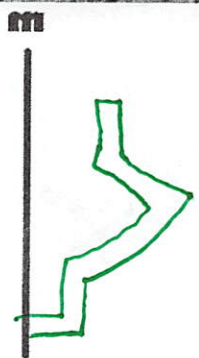
a)



b)



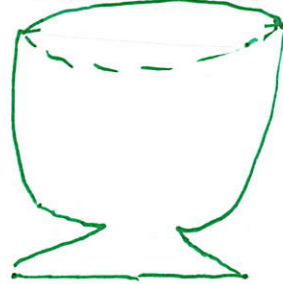
c)



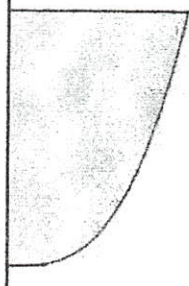
4. a) Use the rotational cross section to sketch the solid.



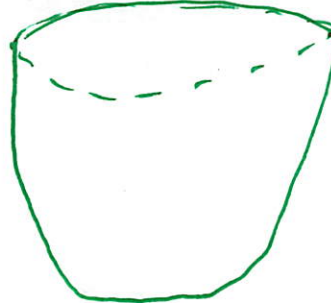
SKETCH OF SOLID



b) Use the rotational cross section to sketch the solid.



SKETCH OF SOLID



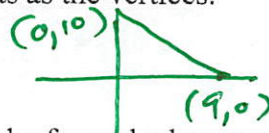
Use the website <http://www.shodor.org/interactivate/activities/3DTransmograpHER>

Question 1: The Right Triangle

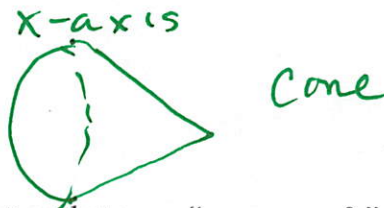
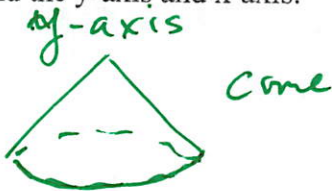
Create a Polygon with 3 vertices. Use the following points as the vertices.

$(9, 0)$ $(0, 0)$ $(0, 10)$

Click the "Graph" button to graph the polygon.

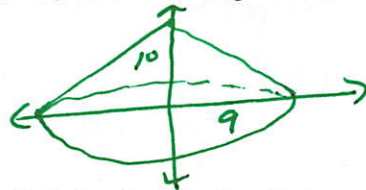


A. Predict and sketch what three-dimensional shape will be formed when you rotate the right triangle around the y-axis and x-axis.



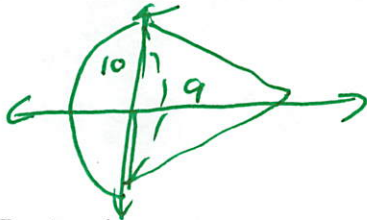
B. Under the "Revolve" box, click the last button that says, "across $x = 0$." Then, click the "Revolve" button. What three-dimensional figure is formed by rotating the right triangle around the y-axis? Was your prediction accurate? Explain your reasoning and sketch a picture.

yes



radius = 9 units
height = 10 units

C. Under the "Revolve" box, click the first button that says, "across $y = 0$." Then, click the "revolve" button. What three-dimensional figure is formed by rotating the right triangle around the x-axis? Sketch a picture.

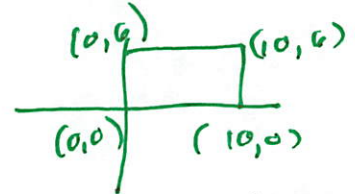


radius: 10 units
height: 9 units

Question 2: The Rectangle

Create a Polygon with 4 vertices. Use the following points as the vertices.

$(10, 0)$ $(10, 6)$ $(0, 6)$ $(0, 0)$

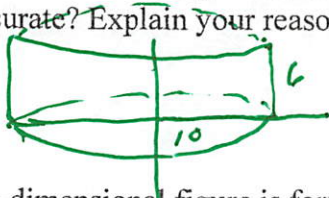


A. Predict and sketch what three-dimensional shape will be formed when you rotate the rectangle around the y-axis and the x-axis.



B. What three-dimensional figure is formed by rotating the rectangle around the y-axis? Was your prediction accurate? Explain your reasoning and sketch a picture.

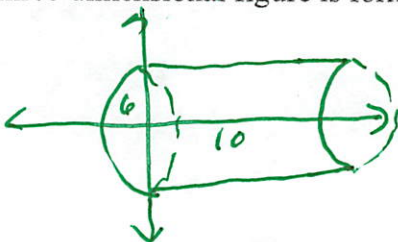
yes



radius: 10 units
height: 6 units

Cylinder

C. What three-dimensional figure is formed by rotating the rectangle around the x-axis? Sketch a picture.



Cylinder

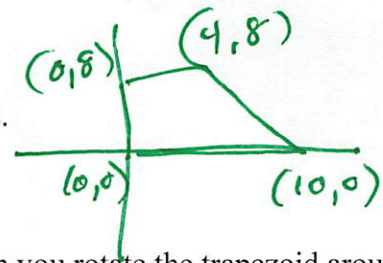
radius: 6 units
height: 10 units

Question 3: The Trapezoid

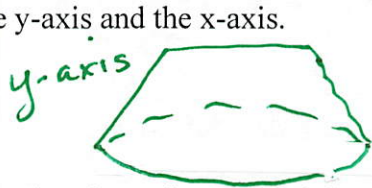
Create a Polygon with 4 vertices. Use the following points as the vertices.

$(10, 0)$ $(4, 8)$ $(0, 8)$ $(0, 0)$

Click the "Graph" button to graph the polygon.



A. Predict and sketch what three-dimensional shape will be formed when you rotate the trapezoid around the y-axis and the x-axis.



Cone with no top

x-axis
Cylinder with cone on top

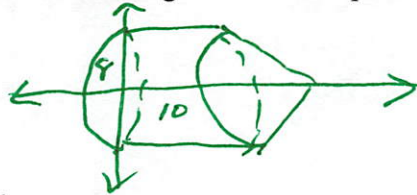
B. What three-dimensional figure is formed by rotating the trapezoid around the y-axis? Was your prediction accurate? Explain your reasoning and sketch a picture.



Cone without top
radius: 10 units
height: 8 units

Yes

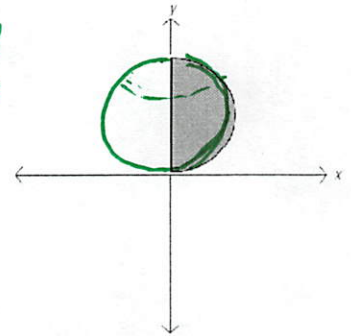
C. What three-dimensional figure is formed by rotating the trapezoid around the x-axis? Was your prediction accurate? Explain your reasoning and sketch a picture.



radius of cone & cylinder: 10 units
height of entire solid: 8 units

Question 4: The Semicircle

Given the semicircle to the right.



A. What three-dimensional figure is formed when the semicircle is rotated around the y-axis?

Sphere

B. What three-dimensional figure is formed when the semicircle is rotated around the x-axis?

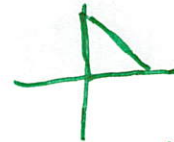
Donut



Question 5: Working Backwards

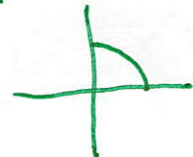
A. What two-dimensional figure is rotated around the x-axis to form a cone?

Triangle



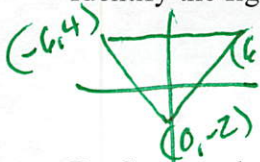
B. What two-dimensional figure is rotated around the y-axis to form a hemisphere?

1/4 circle



Question 6: Summary

A. What two-dimensional figure would you rotate and around which axis to make an upside down cone? Identify the figure and sketch the picture.

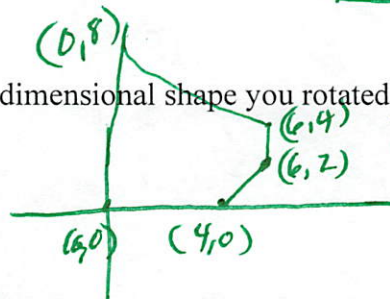
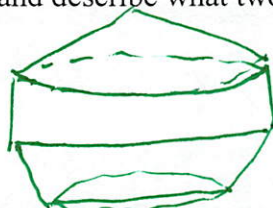


and rotate on y-axis
The vertex below x-axis



B. Create a three-dimensional figure and describe what two-dimensional shape you rotated to form your figure.

Diamond



Dentager