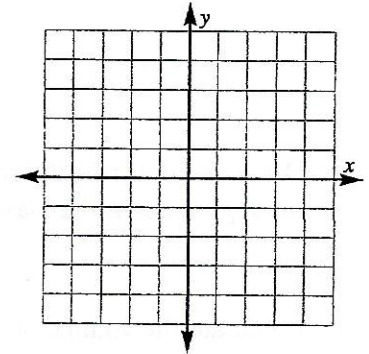


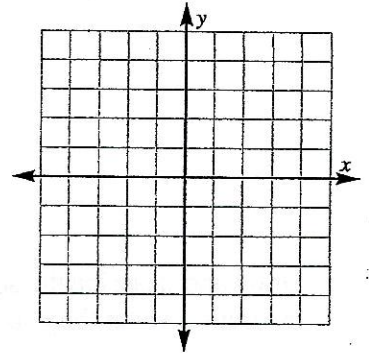
Solids of Revolution

General instructions: When calculating volumes of cylinders and cones, give your answer both in terms of π and also as a decimal accurate to three decimal places. Use the π key on your calculator and then round your answer as the last step.

1. a. Draw line segments joining the points $(0, 0)$, $(0, 2)$, $(3, 2)$, and $(3, 0)$.
b. Calculate the area of the region formed.

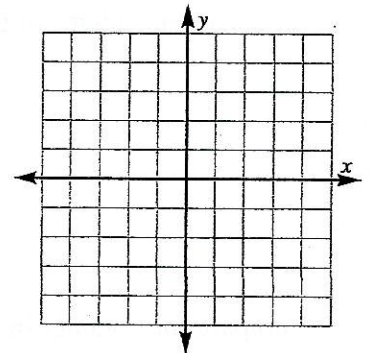


- c. Draw and describe the solid formed by revolving the region about the x -axis.



- d. Calculate the volume of the solid formed.

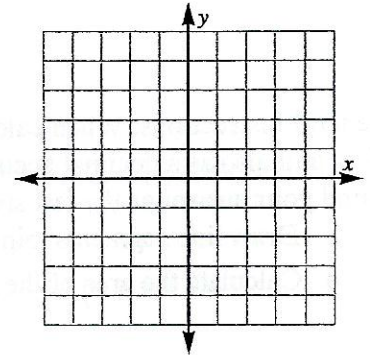
- e. Draw and describe the solid formed by revolving the region about the y -axis.



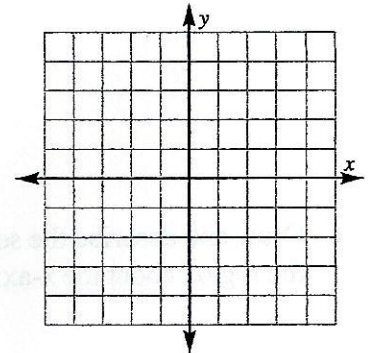
- f. Calculate the volume of the resulting solid.

- g. Compare the volumes in parts (d) and (f). Explain why these volumes are different.

2. a. Draw line segments joining the points $(0, 0)$, $(0, 3)$, and $(2, 0)$.
b. Calculate the area of the region formed.

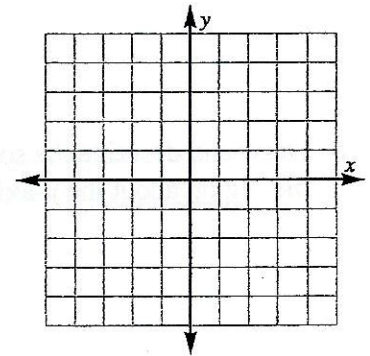


- c. Draw and describe the solid formed by revolving the region about the x -axis.



- d. Calculate the volume of the solid formed.

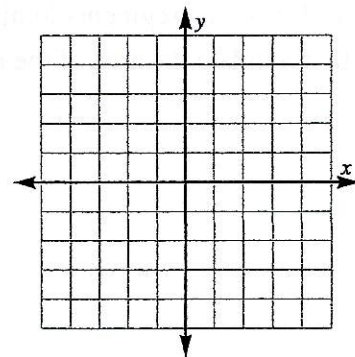
- e. Draw and describe the solid formed by revolving the region about the y -axis.



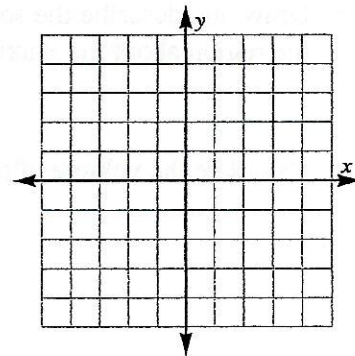
- f. Calculate the volume of the resulting solid.

- g. Compare the volumes in parts (d) and (f). Explain why these volumes are different.

3. a. Draw line segments joining the points $(0, 0)$, $(0, 1)$, and $(5, 0)$.
b. Calculate the area of the region formed.

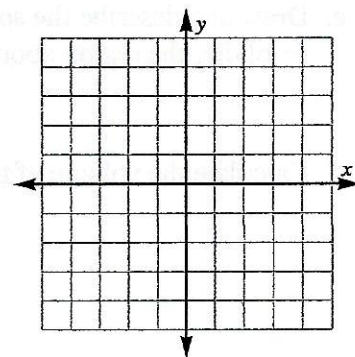


- c. Draw and describe the solid formed by revolving the region about the x -axis.



- d. Calculate the volume of the solid formed.

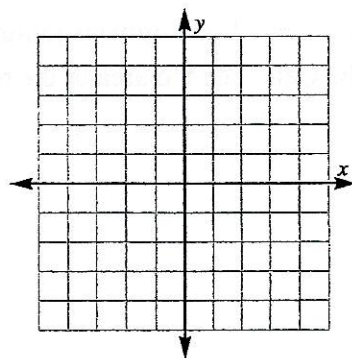
- e. Draw and describe the solid formed by revolving the region about the y -axis.



- f. Calculate the volume of the resulting solid.

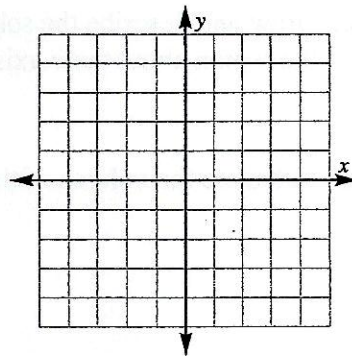
- g. Compare the volumes in parts (d) and (f). Explain why these volumes are different.

4. a. Draw line segments joining the points $(0, 0)$, $(0, 3)$, $(5, 3)$, and $(5, 0)$.
b. Calculate the area of the region formed.



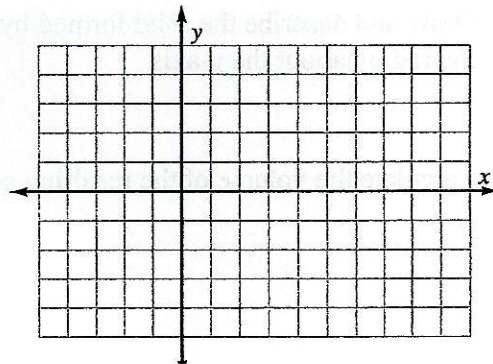
- c. Draw and describe the solid formed by revolving the region about the x -axis.

- d. Calculate the volume of the solid formed.

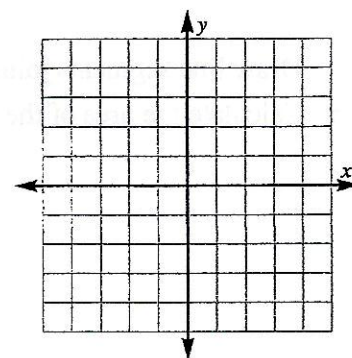


- e. Draw and describe the solid formed by revolving the region about the vertical line $x = 5$.

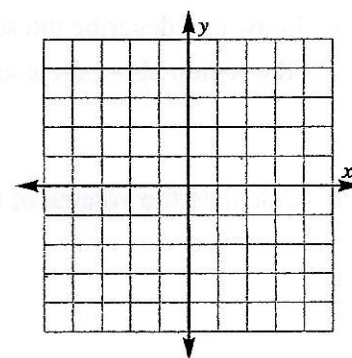
- f. Calculate the volume of the resulting solid.



5. a. Draw line segments joining the points $(0, 0)$, $(0, 5)$, $(2, 3)$, and $(2, 0)$.
b. Calculate the area of the region formed.

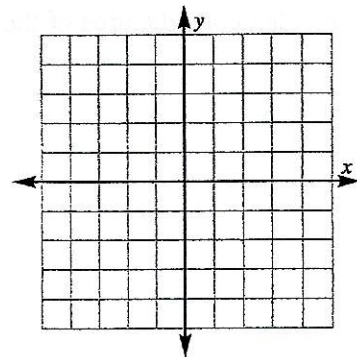


- c. Draw and describe the solid formed by revolving the region about the y -axis.

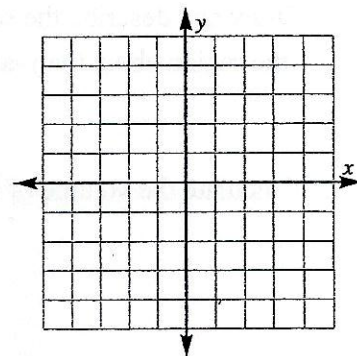


- d. Calculate the volume of the solid formed.

6. a. Draw line segments joining the points $(0, 0)$, $(2, 4)$, and $(2, 0)$.
b. Calculate the area of the region formed.

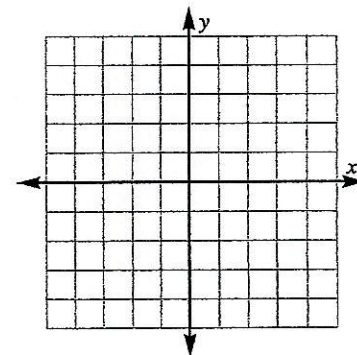


- c. Draw and describe the solid formed by revolving the region about the x -axis.



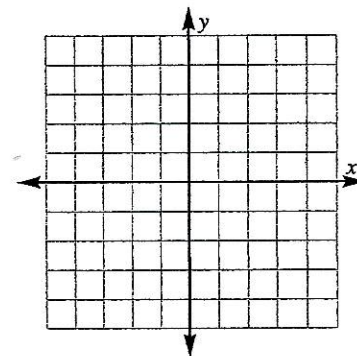
- d. Calculate the volume of the solid formed.

- e. Draw and describe the solid formed by revolving the region about the vertical line $x = 2$.



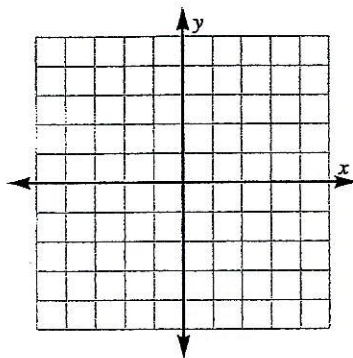
- f. Calculate the volume of the resulting solid.

- g. Draw and describe the solid formed by revolving the region about the y -axis.

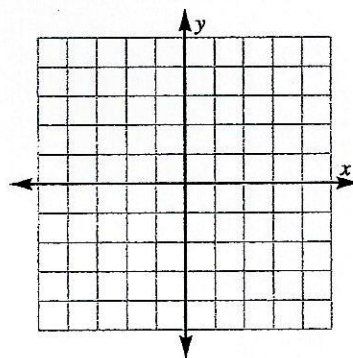


- h. Calculate the volume of the solid formed.

7. a. List three ordered pairs to create a triangular region that will produce the same volume when revolved about the x - and y -axes.



- b. List three ordered pairs to create a triangular region that will produce different volumes when revolved about the x - and y -axes.



- c. Compare these figures with a classmate. Write a general statement about the characteristics of the triangles that produce the same volume when revolved about the x - and y -axes and the characteristics of the triangles that produce different volumes when revolved about x - and y -axes.