NAME_____DATE_____PER._____

FUNCTION APPLICATIONS WITH GRAPHS

Draw sketches as necessary, <u>show all work</u>, and <u>simplify answers</u>.

1. A cylinder is generated by rotating a rectangle with perimeter 12 inches about one of its sides.

_____	a) If the radius of the cylinder is x, express the height, y, of the cylinder in terms of x.
_____	b) Express the volume of the cylinder, V, in terms of x, the radius.
_____	c) Find the volume of the cylinder when the radius is 4 inches.

2. A rectangle is bounded by the x-axis and the semicircle with radius 12 and center at (0, 0).

a) Sketch a picture of the problem.	
_____	b) Write the equation of the semicircle.
_____	c) Give the coordinates on the graph (vertices of rectangle) in terms of x.
_____	d) Write the area, A, of the rectangle as a function of x.

	e) Find the area when x = 9. Round to the nearest tenth.
_____	

3. The portion of the vertical line through the point (x, 0) that lies between the x-axis and the graph of y = $\sqrt{x}$ is revolved about the x-axis.

	a) Give the coordinates on the graph in terms of x.
_____	
_____	b) Express the area, A, of the resulting disk (i.e. circle) as a function of x.
_____	c) Find the area of the disk if x = 9.

4. The area bounded by a vertical line through the point (x, 0), the line y = 5, and the y-axis is revolved around the x-axis.

	a) Give the coordinates of the point of intersection of the vertical line passing through (x, 0) and the line y = 5 in terms of x.
_____	
_____	b) Find the volume of the resulting solid in terms of x.
_____	c) Find the volume when x = 3.