TOPIC 19-5: FUNCTION APPLICATIONS WITH GRAPHS

EXAMPLE 1: A rectangle is bounded by the x-axis and the semicircle $y = \sqrt{25 - x^2}$.

a) Give the coordinates of the vertices of the rectangle in terms of x.

b) Write the area, A, of the rectangle as a function of x.

c) Find the area when x = 4 feet.

EXAMPLE 2: ΔOAB is an isosceles triangle with vertex O at the origin, vertices A & B on the parabola $y = 9 - x^2$ and is bounded by the x-axis.

a) Sketch a graph of the problem situation.

b) Give the coordinates of points on the graph (vertices of the triangle) in terms of x.

c) Express the area, A, of the triangle as a function of x.

d) Find the area when x = 2.

EXAPMLE 3: The area bounded by a vertical line through the point (x, 0), the line y = 3, 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 = 3 in terms of x.

b) Find the volume of the resulting solid in terms of x.

c) Find the volume when x = 5.