TOPIC 19-4: FUNCTION APPLICATIONS WITH CONES

Example 1: A water reservoir is in the form of an inverted right cone that is 12 feet high and has a radius of 6 feet. Water is poured into the reservoir to a height of x.

a) Sketch a picture of the problem situation.

b) Find x when the radius of the water is 4 feet.

c) Express the radius of the water in terms of the height x of the water.

d) Express the volume of the water in terms of x.

e) Find the volume of the water when the height of the water is 9 feet.

Example 2: Water is flowing at a rate of 5 m^3/sec from the tip of a tank that is in the shape of an inverted right cone. The cone has a diameter of 60 m and a height of 120 m.

a) Draw a sketch of this problem situation.

b) Find the volume, V, of the water when the tank is full.

c) How many minutes does it take to drain the tank if it is full?

d) Find the radius of the water in terms of the height of the water.

e) Find the volume, V, of the water as a function of the water level, h.