

NAME _____ DATE _____ PER. _____

FUNCTION APPLICATIONS WITH CONES**Draw sketches as necessary, show all work, and simplify answers.**

1. A pile of sand is in the shape of a cone with a diameter that is twice the height.

<hr/>	a) Find the radius in terms of the height.
<hr/>	b) Express the volume, V , of the sand as a function of the height, h .
<hr/>	c) Find the volume when $h = 3$ meters.

2. A paper cup that is in the shape of a right cone is 6 inches in diameter and has a height of 6 inches.

<hr/>	a) What is the radius of the water when the height of the water is 4 inches?
<hr/>	b) Express the height of the water, x , in terms of the radius, r , of the water.
<hr/>	c) Express the volume of the water, V , in terms of the radius, r , of the water.
<hr/>	d) Find the volume of the water when the radius of the water is 3 inches.

3. An empty water tank is in the form of an inverted right cone. The height of the cone is 30 meters and the radius of the cone is 10 meters. Water is being poured into the cone at a constant rate. After 4 minutes the height of the water is 6 meters.

<hr/>	a) What is the radius of the water when the height is 6 meters?
<hr/>	b) Express the radius of the water in terms of the height, x , of the water.
<hr/>	c) Express the volume of the water as a function of the water's height, x .
<hr/>	d) What is the volume of the water in the tank after 4 minutes?
<hr/>	e) What is the rate at which water is poured into the tank?
<hr/>	f) How long will it take to fill the tank?

4. Water is being stored in a conical tank with height of 12 feet and a base diameter of 8 feet. Write an expression for the volume of the water in the conical tank as a function of h , the height of the water in the tank.