RELATED RATES FOR DAY 2 NAME

***CALCULATOR ACTIVE***

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| 1. |  | A person whose height is 6 feet is walking away from the base of a streetlight along a straight path at a rate of 4 feet per second. If the height of the streetlight is 20 feet, what is the rate at which the person’s shadow is lengthening? |

2. The diagonal of a square is increasing at a rate of 3 inches per minute. When the area of the square is

 18 square inches, how fast is the perimeter increasing?

3. A spherical snowball with diameter 4 inches is removed from the freezer in June and begins melting

 at a rate of 2 in3/hour. At what rate is the surface area of the sphere changing when the radius of the

 snowball is 1 inch? 

4. A conical reservoir (vertex down) has a depth of 20 feet and a radius at the top of 10 feet. The reservoir

 is being filled so that the depth of the water is increasing at a rate of 0.5 ft/hr. At what rate is the volume

 of the tank changing when the water is 8 ft deep?

5. A 5-meter ladder is leaning against a wall. The bottom of the ladder begins sliding away from the wall at

 a rate of 0.8 m/s. At what rate is the top of the ladder sliding down the wall when the base of the ladder

 is 3 meters from the base of the wall?

6. A spy uses a telescope to track a rocket that is launched vertically from a launching pad 6 km away. At what rate is the nose of the rocket traveling at the moment when the angle of elevation from the telescope to the nose of the rocket is π/3 and this angle is increasing at 0.9 radians/minute?

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| 7. |  | A coffeepot has the shape of a cylinder with radius 5 inches, as shown in the figure. Let *h* be the depth of the coffee in the pot, measured in inches, where *h* is a function of time *t*, measured in seconds. The volume *V* of coffee in the pot is changing at the rate of  cubic inches per second. (The volume of a cylinder is ) Show that . |