Calculus AB Name_____

Worksheet 11 - Related Rates

Period____

Solve each related rate problem.

1) A spherical snowball melts at a rate of $\frac{256\pi}{3}$ in³/sec. At what rate is the radius of the snowball changing when the radius is 3 in?

2) A conical paper cup is 10 cm tall with a radius of 10 cm. The bottom of the cup is punctured so that the water leaks out at a rate of $\frac{2\pi}{3}$ cm³/sec. At what rate is the water level changing when the water level is 5 cm?

3) Oil spilling from a ruptured tanker spreads in a circle on the surface of the ocean. The radius of the spill increases at a rate of 5 m/min. How fast is the area of the spill increasing when the radius is 8 m?

4) An observer stands 500 ft away from a launch pad to observe a rocket launch. The rocket blasts off and maintains a velocity of 500 ft/sec. Assume the scenario can be modeled as a right triangle. How fast is the angle of elevation (in radians/sec) from the observer to rocket changing when the rocket is 1200 ft from the ground?

5) A 6 ft tall person is walking towards a 17 ft tall lamppost at a rate of $\frac{3}{x}$ ft/sec, where x is the distance from the person to the lamppost. Assume the scenario can be modeled with right triangles. At what rate is the length of the person's shadow changing when the person is 10 ft from the lamppost?

