

**3.7 Related Rates Day 2**

1) An airplane is flying at an altitude of 6 miles on a flight path that will take it directly over a radar tracking station. If the distance between the plane and the tracking station is decreasing at a rate of 400 miles per hour when the distance is 10 miles, what is the speed of the plane?

2) A 17 ft ladder is leaning against a wall. If the bottom of the ladder is pulled along the ground away from the wall at a constant rate of 5 ft/sec, how fast will the top of the ladder be moving down the wall when it is 8 ft above the ground?

3) A rocket, rising vertically, is tracked by a radar station that is on the ground 5 mi from the launch pad. How fast is the rocket rising when it is 4 miles high and its distance from the radar station is increasing at a rate of 2000 mi/hr?

4) A conical water tank with vertex down has a radius of 10 ft at the top and is 24 ft high. If water flows into the tank at a rate of 20 cubic feet per minute, how fast is the depth of the water increasing when the water is 16 ft deep?

5) Sand pouring from a chute forms a conical pile whose height and diameter are always the same. If the height increases at a constant rate of 5 ft/min, at what rate is sand pouring from the chute when the pile is 10 ft high?

6) A street light is at the top of a 12 ft tall pole. A woman 6 ft tall walks away from the pole with a speed of 5 ft/sec along a straight path. How fast is the tip of her shadow moving when she is 30 ft from the base of the pole?