Steps for Solving Related Rates Word Problems

1. _____

2. _____

3. _____

4. _____

5. _____

1. Assume that oil spilled from a ruptured tanker spreads in a circular pattern whose radius increases at a constant rate of 2 ft/sec. How fast is the area of the spill increasing when the radius of the spill is 60 ft?

2. A stone dropped in a still pond sends out a circular ripple whose radius increases at a constant rate of 6 inches/sec. How rapidly is the area enclosed by the ripple increasing at the instant that the radius is 40 inches?

3. Air is being pumped into a spherical balloon at the rate of 4.5 cubic inches/minute. Find the rate of change of the radius at the moment when the radius is 2 inches.

4. A spherical balloon is inflated so that its volume is increasing at a rate of 3 cubic feet/minute. How fast is the diameter of the balloon increasing when the radius is 1 foot?

5. A 17 foot ladder is leaning against a wall. If the top of the ladder slips down the wall at a rate of 2 feet/sec, how fast will the foot be moving away from the wall when the top is 5 feet above the ground?

6. A 13 foot ladder is leaning against the wall. If the foot of the ladder slides away from the wall at a rate of 1 foot/sec, how fast will the top of the ladder be sliding down the wall when the top is 4 ft above the ground?

7. A softball diamond is a square whose sides are 60 feet long. Suppose that a player running from second base to third base has a speed of 30 ft/sec when she is 20 feet from the base. At what rate is the player's distance from home plate changing at that instant?

8. A baseball diamond is a square whose sides are 90 ft long. Suppose that a player running from first to second base has a speed of 25 ft/sec at the instant that player is 10 feet from second base. At what rate is the player's distance from home plate changing at that instant?

9. Sand pouring from a chute forms a conical pile whose height is always equal to the diameter. 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 feet high?

10. At a sand and gravel plant in Menifee, sand is falling off a conveyor belt and onto a conical pile at the rate of 10 cubic feet/min. The diameter of the base of the cone is three times the altitude. At what rate is the height of the pile changing when it is 15 feet high?