

Worksheet 12 - Section 2.7

- (1) Each side of a square is increasing at a rate of 6 cm/sec . At what rate is the area of the square increasing when the area of the square is 16 cm^2 ?
- (2) A cylindrical tank with radius 5 m is being filled with water at a rate of $3 \text{ m}^3/\text{min}$. How fast is the height of the water increasing?
- (3) The radius of a spherical ball is increasing at a rate of 2 cm/min . At what rate is the surface area of the ball increasing when the radius is 8 cm ?
- (4) A plane flying horizontally at an altitude of 1 mi and a speed of 500 mi/h passes directly over a radar station. Find the rate at which the distance from the plane to the station is increasing when it is 2 mi away from the station.
- (5) A street light is mounted at the top of 15-ft tall pole. A man 6 ft tall walks away from the pole at a speed of 5 ft/sec along a straight path. How fast is the tip of his shadow moving when he is 40 ft from the pole?
- (6) Two cars start moving from the same point. One travels south at 60 mi/h and the other travels west at 25 mi/h . At what rate is the distance between the cars increasing two hours later?
- (7) The top of a ladder slides down a vertical wall at a rate of 0.15 m/s . At the moment when the bottom of the ladder is 3 m from the wall, it slides away from the wall at a rate of 0.2 m/s . How long is the ladder?
- (8) A water trough is 10 m long and a cross-section has the shape of an isosceles trapezoid that is 30 cm wide at the bottom, 80 cm wide at the top, and has height 50 cm . If the trough is being filled with water at the rate of $0.2 \text{ m}^3/\text{min}$, how fast is the water level rising when the water is 30 cm deep?