

NAME: _____

REVIEW #3
RELATED RATES
JCC MAT 1710

DATE: _____

1. A weather balloon is rising vertically at a rate of 10 ft/sec. An observer is standing on the ground 300 feet horizontally from the point where the balloon was released. At what rate is the distance between the observer and the balloon changing when the balloon is 400 feet high?
2. As a balloon in the shape of a sphere is being blown up, the volume is increasing at the rate of 4 cubic inches per second. At what rate is the radius increasing when the radius is 1 inch?
3. The radius of a circle is increasing at the rate of 5 inches per minute. At what rate is the area increasing when the radius is 10 inches.
4. Sand is falling off a conveyor onto a conical pile at the rate of 15 cubic feet per minute. The diameter of the base of the cone is approximately twice the altitude. At what rate is the height of the pile changing when it is 10 feet high?
5. A balloon rises at the rate of 8 feet per second from a point on the ground 60 feet from an observer. Find the rate of change of the angle of elevation when the balloon is 25 feet above the ground.
6. The volume of a cube is changing at the rate of 18 cubic centimeters per second. How fast is the edge of the cube expanding when each edge is 2 centimeters?
7. A 5 meter long ladder is leaning against the side of a house. The foot of the ladder is pulled away from the house at a rate of 0.4 m/sec. Determine how fast the top of the ladder is descending when the foot of the ladder is 3 meters from the house.
8. Two boats leave the same port at the same time with one boat traveling north at 15 knots per hour and the other boat traveling west at 12 knots per hour. How fast is the distance between the two boats changing after 2 hours?
9. The height of a cylinder with a radius of 4 cm is increasing at a rate of 2 centimeters per minute. Find the rate of change of the volume of the cylinder with respect to time when the height is 10 centimeters?

10. A man 6 foot tall is walking at 3 ft/sec towards a street light 18 feet high.
- How fast is his shadow length changing?
 - How fast is the tip of his shadow moving?
11. Joe, who is 5 feet tall, walks away from the base of a 16 feet high lamppost at a rate of 4 ft/sec.
- At what rate is the length of his shadow changing when he is 18 feet from the pole?
 - How fast is the tip of his shadow moving?
12. A light is hung 15 feet above the ground. If a 6 foot tall girl is walking away from the light at 5 ft/sec...
- How fast is her shadow length changing?
 - How fast is the tip of her shadow moving?
13. A 5 meter ladder is resting against a vertical wall. Then comes along George and once he gets to the top of the ladder it begins to slide down the wall at a rate of 2 m/sec. How fast is the base of the ladder moving away from the wall at the instant the base is 4 meters from the wall?