Calculus AB CW 2.5 – 2.6: Implicit Differentiation and Related Rates
<u>Calculator is okay, but answers have to be in simplified radical form or in terms of pi.</u>

1. Find $\dfrac{d^2 y}{dx^2}$ of $x^2 + 2xy = 1$

2. Find $\dfrac{d^2 y}{dx^2}$ of $x = \sin y$

3. If the length of the edge of a cube is increasing at a rate of 5cm/sec, find the rate of change of the volume of the cube when an edge is 12cm.

4. A 10-foot ladder is leaning against the wall of a house. The base of the ladder slides away from the wall at a rate of 2 in/sec. Find the rate at which the top of the ladder slides down the wall when the base is 3 feet from the wall.

5. A water tank is in the shape of a cone with a base radius of 20 ft and has a height of 50 ft. Water is entering the tank at a rate of 6 ft^3 / hr. At what rate is the height of the water changing when the height of the water is 12 ft.

6. Two people start out 500 meters apart with person A directly to west of person B. At the same time both people start moving with person A traveling to the east at 2 m/min while person B travels north at 3 m/min. Determine the rate of change between the two individuals after 1 hour. Based on the rate of change, is the distance between the two poeple increasing, decreasing, or not changing after 1 hour?