Calculus Name_____
Date____
Period_____

2.6 Related Rates Notes

Related Rates:

Guidelines from page 153
1. Identify all *given* quantities and *quantities to be determined*. Make a sketch and label the quantities.
2. Write an equation involving the variables whose rates of change either are given or are to be determined.
3. Using the Chain Rule, implicitly differentiate both sides of the equation *with respect to time.*
4. AFTER completing Step 3, substitute into the resulting equations all known values for the variables and their rates of change. Then solve for the required rate of change.

1. Air is being pumped into a spherical balloon at a rate of 4 cubic inches per second. How fast is the radius of the balloon changing when the radius of the balloon is 5 inches?

2. The base of a 15-foot ladder is sliding away from a house at a rate of 2 feet per minute when the base of the ladder is 9 feet away from the house. What is the rate the top of the ladder is sliding down the house at?

3. Suppose oil spills from a ruptured tanker and spreads in a circular pattern. If the radius of the spill increases at a constant rate of 2.5 meters per second, how fast is the area of the spill increasing when the radius is 40 meters?

4. Two cars start moving from the same point. One travels north at 50 miles per hour and the other travels east at 30 miles per hour. At what rate is the distance between the cars increasing two hours later?

5. A conical tank (with vertex down) is 10 feet across the top and 12 feet deep. If water is flowing into the tank at a rate of 10 cubic feet per minute, find the change of depth of the water when the water is 8 feet deep.