AMI DAY 2: Wednesday, March 18th, 2020 **AP Calculus AB**

Related Rate Word Problems

1. Draw a diagram and label the quantities that don't change with their respective values and quantities that do change with respect to time as variables.
2. Mathematically specify the rate of change that you are looking for and record all other given information.
3. Find an equation involving the variables whose rates of change you are looking for and that you have been given.
4. Implicitly differentiate the equation found in Step 3 with respect to time.
5. State the final answer in a coherent form being sure to specify the units of the answer and being sure the original question is answered not just something simply related to the answer.

Hints:

- *Always use units to double check your algebra.*
- *DO NOT plug in any constants for changing quantities until after you have differentiated.*
- *Know what the units are when you differentiate a quantity.*

8. A ladder 13 feet long is leaning against the side of a building. If the foot of the ladder is pulled away from the building at a constant rate of 2 inches per second, how fast is the angle formed by the ladder and the ground changing (in radians per second) at the instant when the top of the ladder is 12 feet above the ground?

9. A ladder 13 feet long is leaning against the side of a building. If the foot of the ladder is pulled away from the building at a constant rate of 8 inches per second, how fast is the area of the triangle formed by the ladder, the building and the ground changing (in feet squared per second) at the instant when the top of the ladder is 12 feet above the ground?