Amber Clutter
Lizzie DeRosier

5.31.17 and 6.1.17 Section 2.8 Classwork Reflection

Yesterday and today's lesson discussed related rates, primarily how implicit differentiation (Section 2.6) was applied to word problems and real situations (Section 2.8). The two main components of this lesson are 1. Differentiation with respect to time and 2. The chain rule. Ultimately the goal here is to find the rate of change using derivative to solve problems that have both movement and change occurring in them

A five step process helps us to understand this lesson and can used for most related rate problems. The best way to describe this is using an example. The problem used in class was determining whether a boat being pulled in by a rope from the dock at a constant speed. We wanted to determine if the boat's velocity increased as it got closer to the dock.

Step 1: Draw a picture:
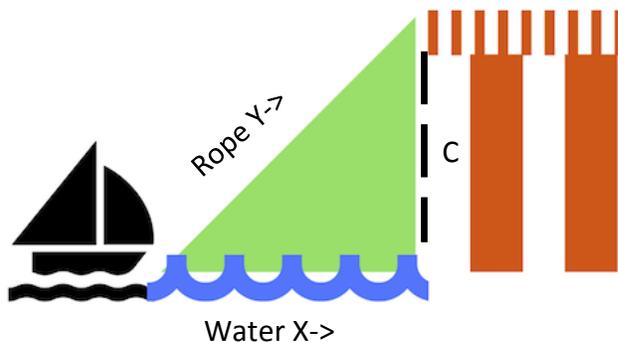
Step 2: Identify given information:
-The dock height is a constant
- The rope and length of water (distance to the dock) are changing
- The rope is being pulled at a constant rate

Step 3: Write down an equation:
-We can see from our picture that the rope forms a triangle, which is in green, so we used the Pythagorean Theorem.

$Y^2 = X^2 + C^2$

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Step 4: Differentiate with respect to time:

$y^2 = x^2 + c^2$

$2y\ (dy/dt) = 2x(dx/dt)$

$dx/dt = (y/x)\ (dy/dt)$

Step 5: Use given information to solve for the unknown:
- From above, dy/dt = constant since the boat is being pulled in at a constant rate. As $x \rightarrow 0$ (the boat is approaching the dock) the quantity $(y/x)\ (dy/dt)$ gets larger. In other words, dx/dt increases as the boat approaches the dock. Therefore, the speed of the boat increases as the boat approaches.

Using this step-by-step process helps to figure out the question and makes it easier to find information that is "hidden" in the problem. The process also allows you to find the solution in an efficient manner.