Math 120 HW 2 Hints

The following question have been popular in office hours and quiz section, so I offer a few hints to get you started. Some of these are just comments to help get you thinking about the problem. I will discuss Chapter 6 on Wednesday in lecture, so 6.1-6.3 and 6.5-6.6 should be easier after Wednesday's lecture.

Problem 4.8: This is meant to be a challenging problem. Here are two hints:

1. Try labeling all points of interest (in particular, you may want to label the point where the line is tangent to the circle).

2. The following two facts will be useful (1) the equation for the circle, (2) the fact about perpendicular slopes (think about the line that goes from the origin to the tangent point).

Problem 5.1(f): Mimic what we did in class on parts (a)-(e). For (f), let me illustrate what they mean by rationalize on an example:

$$\frac{\sqrt{2}-\sqrt{7}}{5} = \frac{(\sqrt{2}-\sqrt{7})}{5}\frac{(\sqrt{2}+\sqrt{7})}{(\sqrt{2}+\sqrt{7})} = \frac{2-\sqrt{2}\sqrt{7}+\sqrt{2}\sqrt{7}-7}{5(\sqrt{2}+\sqrt{7})} = \frac{-5}{5(\sqrt{2}+\sqrt{7})} = \frac{-1}{\sqrt{2}+\sqrt{7}}$$

The first step, when we multiply by $\frac{(\sqrt{2}+\sqrt{7})}{(\sqrt{2}+\sqrt{7})}$, we are rationalizing the numerator. Use a similar multiplication in part (f), stop when you get h to cancel.

Problem 5.4: Give me short explanations of your answers (you don't need to do a bunch of work). Graphing the Monk's distance from the bottom of the mountain may help you think about it.

Problem 6.9: Make sure you are clear about your times. Let $t =$ time since leaving home plate. He takes 90/18=5 seconds to go from one base to the next. Note: Between 0 and 5 seconds, t is the time that Edgar has been running between home and first base. However, between 5 and 10 seconds, $t-5$ is the time that Edgar has been running between first and second base (Similarly, between 10 and 15 seconds, $t-10$ is the time that Edgar has been running between second and third). Use this information along with the speed to label sides of right triangles and use the Pythagorean theorem to give the distance (you will have four different formulas).