CAP 2017, HW 4 due February 14

Give complete explanations of what you are doing, written in full sentences. Solutions that have all the correct calculations and computations, but lack explanations, will not get full marks!

1. Using the guidelines of section 4.4, sketch the graph of the curve $\tan^{-1}\left(\frac{x-1}{x+1}\right)$.

2. The manager of a 100-unit apartment complex knows from experience that all units will be occupied if the rent is $\pounds 800$ per month. A market survey suggests that, on average, one additional unit will remain vacant for each $\pounds 10$ increase in rent. What rent should the manager charge to maximise profit?

3. Two balls are thrown upward from the edge of a cliff 140 meters above the ground. The first is thrown with a speed of 15 m/s, the other is thrown a second later with a speed of 8 m/s. Do the balls ever pass each other?

   [Hint: look at Example 6 in Section 4.7].

4. At 2:00 PM a car's speedometer reads 50 km/h. At 2:10 PM it reads 65 km/h. Show that at some time between 2:00 and 2:10 the acceleration is exactly 90 km/h^2.