

Worksheet 6

SI with Ian

Week of March 24th

Feel free to use notes and other resources, however, please do not use online calculators. Also if you are printing this worksheet out before hand (thank you) please wait to complete the worksheet until the SI session.

1 Session Problems and Agenda

- 1 We are going to start out by graphing functions. The professors love to add one of these questions to exam 3 so if we can get some practice before the week of the exam we should be in a great position.
- 2 State the Mean Value Theorem and Rolle's Theorem without looking at your notes, additionally draw a graph for each that illustrates the theorem.

3 Related Rates

- a A thin sheet of ice is in the form of a circle. If the ice is melting in such a way that the area of the sheet is decreasing at a rate of $0.5 \frac{m^2}{sec}$ at what rate is the radius decreasing when the area of the sheet is $12m^2$?
- b A plane is 750 meters in the air flying parallel to the ground at a speed of $100 \frac{m}{s}$ and is initially 2.5 kilometers away from a radar station. At what rate is the distance between the plane and the radar station changing:
 - Initially
 - 30 seconds after it passes over the radar station?

4 Maxima and Minima

1. Sketch the graph of $h(x) = -(x+4)^3$, find the relative extrema on the following intervals:

(a) $(-\infty, \infty)$

(b) $[-5.5, -2]$

(c) $[-4, 3)$

(d) $[-4, -3]$

2. Below is the graph of $f(x)$ find all the relative and absolute extrema of the function.

