MAE 113: ASSIGNMENT 3

Quiz: 30 January 2020 at 8:00 am.

Exercises from Tan's Calculus 4$^{\text{th}}$ edition.

- §2.5 One-sided Limits and Continuity — 1–8, 9–14, 21, 23, 31, 37, 39, 41, 43, 44, 46, 50, 51, 52, 56, 57, 63, 71, 72, 84, 87, 89, 90, 91, 94, 95
- §2.6 The Derivative — Self-check exercise 2.6 Question 1, p. 158 (Solution is on pp. 163–164).
- §2.6 The Derivative — 5, 8, 9–16, 19, 21, 23 (and also sketch the graph of f' on the same axes as f), 30, 34, 35, 37, 39, 42, 45, 52, 53, 56
- §3.1 Basic Rules of Differentiation — 1, 3, 5, 9, 12, 13, 14, 17, 19, 22, 23, 26, 34, 35, 34, 43, 44, 54, 55, 56, 61, 62, 64

You should know

- what we mean by a limit. The function f has the limit L as x approaches a, written
$$\lim_{x\to a} f(x) = L$$
if the value $f(x)$ can be made as close to the number L as we please by taking X sufficiently close to (but not equal to) a.

  Limits are the *museum exhibits of mathematics*: we can get up as close as we want as long as we don't touch.
- the properties of limits (see the handout from class or Theorem 1 on p. 105)
- the definition of the derivative
$$f'(x) = \lim_{\Delta x\to 0} \frac{f(x+\Delta x) - f(x)}{\Delta x}.$$
- the Intermediate Value Theorem (see p. 131). This is what we called "The Checkpoint Theorem" in class; see your notes from lecture for more details.

Questions and topics from this assignment will be drawn upon for Quiz 3. Please ensure you are working diligently. If you have questions, please see me after class, or by appointment (send me an email). The Math Help Centre is also an under-utilized resource. You can drop in most evenings starting at 7 PM.