Reminders

- Exam 1 takes place in class next Thursday, February 14.
- The Math Department drop-in Help Session for Math 151/171 takes place in Blocker 117 on Monday, Tuesday, Wednesday, and Thursday evenings, 5:00–7:30.
- I have office hours 2:00–3:00 on Monday and Wednesday afternoons in Blocker 601L. I am available also by appointment.
- Our teaching assistant, Angelique, has office hours in Blocker 221B on Tuesday and Thursday afternoons 1:00–2:00 and on Wednesday afternoons 3:00–4:00.

Recap on the derivative

$$f'(b) = \lim_{x \to b} \frac{f(x) - f(b)}{x - b} = \lim_{h \to 0} \frac{f(b+h) - f(b)}{h}$$

Interpretation: $f'(b)$ is the slope of the tangent line to the graph of f at the point $(b, f(b))$;
equivalently, the instantaneous rate of change of the function.

Differentiable functions

A function f can fail to be differentiable (fail to have a derivative) in several ways.
The most common reasons for failure:

- a corner in the graph, like $|x|$
  (there are one-sided derivatives, but they do not match)
- a vertical tangent line
  (the slope is undefined)

Assignment (not to hand in)

- In Section 2.7, Exercises 1, 5, 7, 11, 17, 21, 23, 37, 41.
- In Section 2.8, Exercises 3, 5, 9, 11, 21, 27, 29, 41, 43, 47, 51, 59, 61

Quiz

- If an equation of the tangent line to the curve $y = f(x)$ at the point where $a = 2$ is $y = 4x - 5$, find $f(2)$ and $f'(2)$.
  [Exercise 21 in Section 2.7]

- Find the derivative of the function $f(x) = 3x - 8$ using the definition of derivative.
  [Exercise 21 in Section 2.8]