HW 7: Section 2.1 and 2.2

Due: Thursday, September 26th in SQRC by 9pm

Learning Goals:

- Estimate average velocity and slopes of tangent lines.
- Use limits to compute the derivative of a function.
- Use a graph to sketch a graph of its derivative.

Questions:

1. Let $s(t) = 3(\sin(t-2)$ be a position function. Sketch a graph of this curve.

   a) Find the average velocity between $t = 0$ and $t = 2$.

   b) Find the average velocity between $t = 1$ and $t = 2$.

   c) Find the average velocity between $t = 1.9$ and $t = 2$.

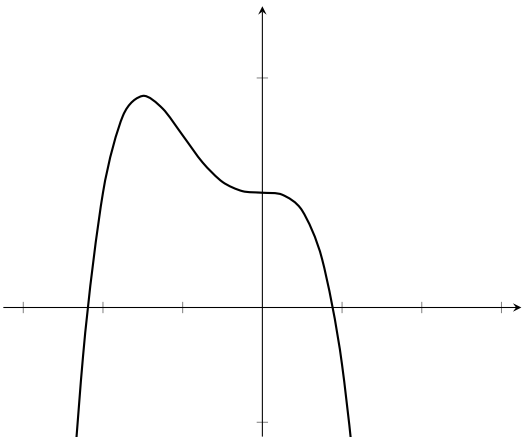
   d) Find the average velocity between $t = 1.99$ and $t = 2$.

   e) Use your answers from the previous parts to estimate the instantaneous velocity at $t = 2$.

2. Use the limit definition to compute the derivative of $f(x) = x^2 - 2x + 1$

3. Use the limit definition to compute the derivative of $f(x) = \dfrac{2}{2x-1}$

4. Using the graph of $f(x)$ below, make a sketch of $f'(x)$.



5. Using the graph of $f(x)$ below, make a sketch of $f'(x)$. What are all the values of x where $f(x)$ is not differentiable.