HW 8: Section 2.3

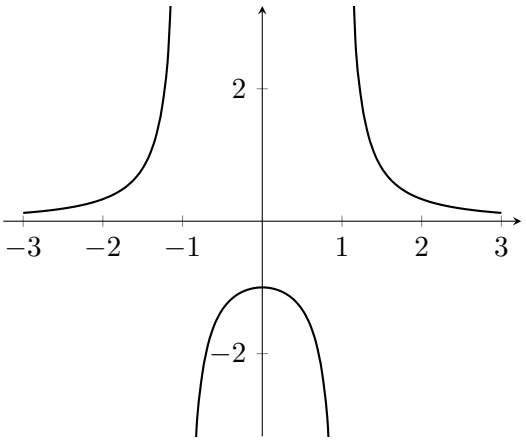
Due: Monday, September 30th in SQRC by 9pm

Learning Goals:

- Use the power rule to compute derivatives.
- Compute higher derivatives of a function.
- Use derivatives to find velocity and accelerations functions.
- Practice using the limit definition of a derivative to prove a derivative rule.

Questions:

1. Compute the derivative of $f(s) = 5\sqrt{s} - 4s^2 + 3$ using derivative rules.
2. Compute the derivative of $f(x) = \frac{4x^2 - x + 3}{\sqrt{x}}$ using derivative rules.
3. Compute $f'''(t)$ for $f(t) = t^6 - \sqrt{t}$.
4. Use the graph of $f(x)$ to sketch a graph of $f'(x)$ and $f''(x)$.



5. The height of baseball is given by the function $s(t) = -4.9t^2 + 12t - 3$. Compute the velocity and acceleration functions of the baseball. At time $t = 1$, is the object going up or down?
6. Write out the argument using the limit definition of derivative that shows that if $f(x) = c$ is a constant function then $\frac{d}{dx} f(x) = 0$.
7. Write out an argument using the limit definition of derivative that shows that if $f(x) = g(x) + h(x)$ then $\frac{d}{dx} f(x) = \frac{d}{dx} g(x) + \frac{d}{dx} h(x)$.