Key Concepts

- Power Rule
  $\frac{d}{dx}x^n = .nx^{n-1}$

- Constant Rule
  Let c be a constant number then
  $\frac{d}{dx}c = 0$

- Product Rules
  Suppose you have h(x) = f(x)g(x) then
  $h'(x) = f'(x)g(x) + f(x)g'(x)$

- Quotient Rule
  Let h(x) = $\frac{f(x)}{g(x)}$ then

$$h'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{(g(x))^2}$$

Practice Problems

1. $f(x) = \pi^{100}$

2. $f(t) = 2.5t^6 - 1.4t^5 + 2t^2 + 3$

3. $y = \frac{2x+7}{5-2x}$

4. $g(t) = t^2(-3t^2 - 2)$

5. $y = (-2x^4 - 3)(-2x^2 + 1)$

6. Find the second order derivatives

   a) $y = -x^2$

   b) $g(x) = 4x^3$