Section 11.2, problem 28:

$$f(x) = \frac{5(x^4-6)}{2} = \frac{5}{2}x^4 - 15 \implies f'(x) = \frac{5}{2} \cdot 4x^3 = 10x^3.$$

Section 11.2, problem 58:

$$f(x) = \frac{3}{\sqrt[4]{x^3}} = 3x^{-3/4} \implies f'(x) = 3 \cdot \left(-\frac{3}{4}\right) x^{-7/4} = -\frac{9}{4}x^{-7/4}.$$

Section 11.2, problem 86:
Remember: *The tangent line is horizontal at the points where the derivative is equal to* 0*.*
Step 1. *Differentiate:*

$$y = \frac{x^6}{6} - \frac{x^2}{2} + 1 \implies y' = \frac{1}{6} \cdot 6x^5 - \frac{1}{2} \cdot 2x = x^5 - x.$$

Step 2. *Solve* $y' = 0$*:*

$$y' = 0 \implies x^5 - x = 0 \implies x(x^4-1) = x(x^2-1)(x^2+1) = 0 \implies x = 0 \text{ or } x = \pm 1.$$

Step 3. *Find the points on the curve:*

$$(0, y(0)) = (0, 1), \quad (-1, y(-1)) = (-1, 2/3) \text{ and } (1, y(1)) = (1, 2/3).$$

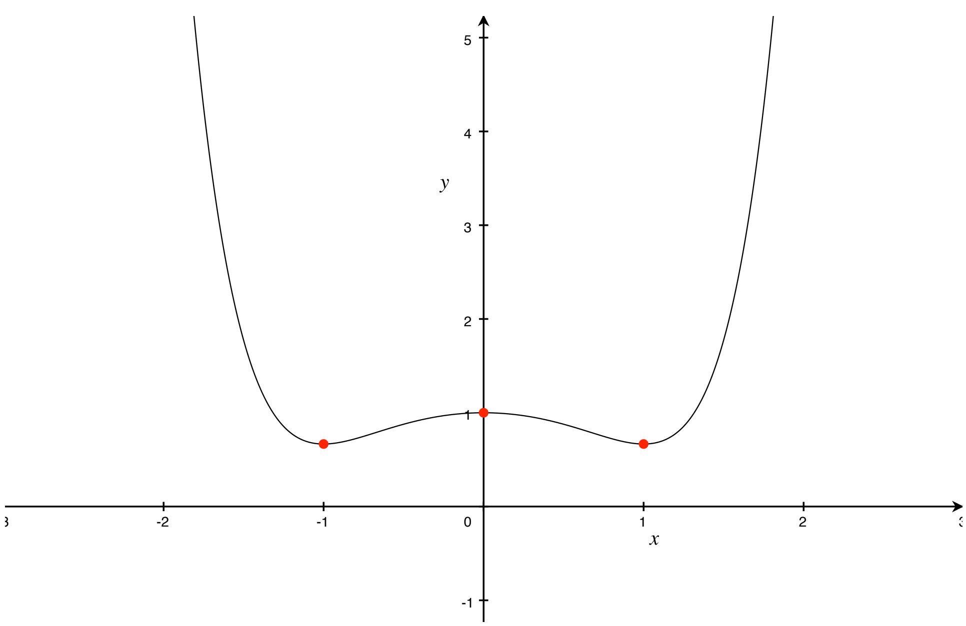

Figure 1: Graph of $y = \frac{x^6}{6} - \frac{x^2}{2} + 1$, with points where $y' = 0$ in red.

Section 11.3, problem 22:

Remember: $\overline{c} = \frac{c}{q}$. *This means that* $c = \overline{c} \cdot q$.

Step 1. *Find the cost function:*

$$\overline{c} = 0.002q^2 - 0.5q + 60 + \frac{7000}{q} \implies c = \overline{c} \cdot q = 0.002q^3 - 0.5q^2 + 60q + 7000.$$

Step 2. *Differentiate to find the marginal cost function:*

$$\frac{dc}{dq} = 0.006q^2 - q + 60.$$

Step 3. *Evaluate at the given points:*

$$\left.\frac{dc}{dq}\right|_{q=15} = 46.35 \quad \text{and} \quad \left.\frac{dc}{dq}\right|_{q=25} = 38.75.$$