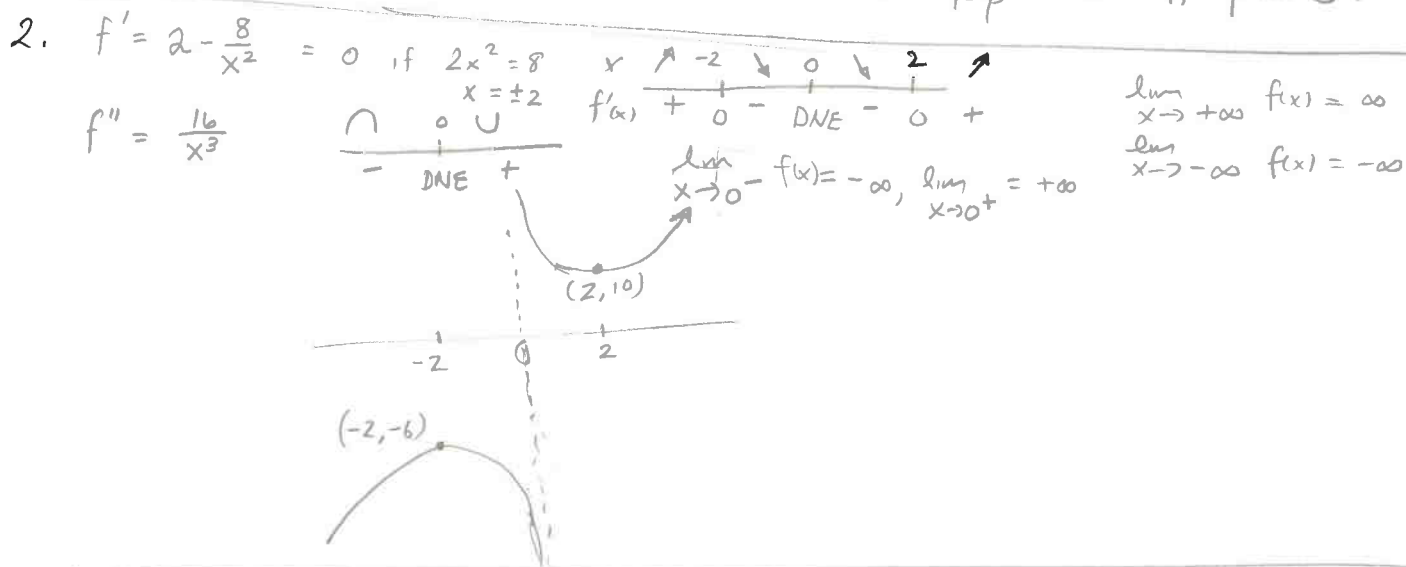


$$1. \frac{P}{Q} \cdot \frac{dQ}{dP} = \left(\frac{P}{Q}\right) \left(\frac{P(-1) - (1-P)}{P^2}\right) = \frac{P}{1-P} \cdot \frac{-1}{P^2} = \frac{P^2}{1-P} \cdot \frac{-1}{P^2} = \frac{-1}{1-P} \quad (a)$$

$$(b) |E(3)| = \left| \frac{-1}{1-3} \right| = \frac{1}{2} \text{ inelastic} \quad (c) \frac{-1}{1-P} = -1 \text{ if } P = 0.$$



3. a) $2x + y' = 3x^2 + 2yy' \Rightarrow 2x - 3x^2 = (2y-1)y' \Rightarrow y' = \frac{2x-3x^2}{2y-1}$

b) $\frac{dy}{du} = 2u+1$, $\frac{du}{dx} = -\frac{1}{x^2}$ so $\frac{dy}{dx} = \left(2\left(\frac{1}{x}\right)+1\right)\left(-\frac{1}{x^2}\right)$

4. a) $10\left(1+\frac{1}{3}\right)^{3 \cdot 2}$ b) $10e^{1 \cdot 2} = 10e^2$

5. (a) $\ln\left(\frac{\sqrt{b}}{c}\right)^{a \cdot \frac{1}{a}} = \ln\left(\frac{\sqrt{b}}{c}\right) = \ln(\sqrt{b}) - \ln c = \frac{1}{2} \ln b - \ln c = \frac{1}{2} \cdot 6 + 2 = 5$

(b) $3 \times 2^{2x} = 3^x \cdot 4^x = \underbrace{3}_{x=1} \cdot \underbrace{4}_{x=1} = \frac{(34)(34)}{x} = \frac{(34)}{x} = 12^x = 144 = 12^2 \Rightarrow x = 2$

6. a) $C'(x) = \frac{2}{5}x + 4 = \text{marg cost}$ $R(x) = C(x) - P(x)$ so $R'(x) = \frac{2}{5}x + 4 - \frac{1}{4} = \text{marg rev.}$

b) $C'(3) = \frac{2}{5}(3) + 4$

c) $C(4) - C(3) =$

$$\left(\frac{1}{5} \cdot 16 + 16 + 57\right) - \left(\frac{1}{5} \cdot 9 + 12 + 57\right) = \frac{1}{5}(16-9) + 4 = \boxed{\frac{7}{5} + 4}$$