

3.2 H.W # 20, and 36. p.197

#20/p.197 $y = \frac{\sqrt{x}-1}{\sqrt{x}+1} \Rightarrow$

$$y' = \frac{(\sqrt{x}+1)(\sqrt{x}-1)' - (\sqrt{x}-1)(\sqrt{x}+1)'}{(\sqrt{x}+1)^2}$$

$$= \frac{(\sqrt{x}+1)\left(\frac{1}{2\sqrt{x}}\right) - (\sqrt{x}-1)\left(\frac{1}{2\sqrt{x}}\right)}{(\sqrt{x}+1)^2}$$

$$= \frac{1}{(\sqrt{x}+1)^2} \left[\cancel{\frac{1}{2}} + \frac{1}{2\sqrt{x}} - \cancel{\frac{1}{2}} + \frac{1}{2\sqrt{x}} \right] = \frac{1}{\sqrt{x}(\sqrt{x}+1)^2}$$

#36/p.198 $P(x) = F(x) G(x)$ and $Q(x) = \frac{F(x)}{G(x)}$.

and from the given graph one can get:

$$F(2) = 3, \quad F'(2) = 0, \quad F(7) = 5, \quad F'(7) = \frac{5-4}{7-3} = \frac{1}{4}$$

$$G(2) = 2, \quad G'(2) = \frac{2-1}{2-0} = \frac{1}{2}, \quad G(7) = 1, \quad G'(7) = \frac{1-3}{7-4} = -\frac{2}{3}$$

$$\textcircled{a} \quad P'(2) = F(2) G'(2) + F'(2) G(2) = (3)\left(\frac{1}{2}\right) + (0)(2) = \frac{3}{2}$$

$$\textcircled{b} \quad Q'(7) = \frac{G(7) F'(7) - G'(7) F(7)}{[G(7)]^2} = \frac{(1)\left(\frac{1}{4}\right) - \left(-\frac{2}{3}\right)(5)}{[1]^2}$$

$$= \frac{1}{4} + \frac{10}{3} = \frac{43}{12}$$