

Section:

Follow the instructions in each problem.

**Show supporting work, not just a final answer, to receive credit on a problem.**

1. (5 pts) Find the derivative of  $\ln(x^8) + (\ln(x))^8$ .

$$\begin{aligned} f'(x) &= \frac{1}{x^8} \cdot 8x^7 + 8(\ln(x))^7 \\ &= \frac{8}{x} + 8(\ln(x))^7 \end{aligned}$$

2. (5 pts) Faith is selling computer monitors. She finds from her revenue function that  $R(20) = 3000$  and that  $R'(20) = 200$ . Use a tangent line approximation to approximate her revenue function near  $x = 20$ . Then find her approximate revenue for selling 23 computer monitors.

$$R(x) \approx 3000 + 200(x - 20)$$

Linear approximation of  $R$  at  $x = 20$

$$\begin{aligned} \Rightarrow R(23) &\approx 3000 + 200(23 - 20) \\ &= 3600 \end{aligned}$$