

Show all work clearly and in order (on this sheet or an attached sheet) and circle your final answers.

Justify your answers algebraically whenever possible. Work without justification may not receive credit.

You have 25 minutes to take this 10 point quiz.

**1.** (3 points) Compute  $\frac{d}{dx} \left[ 2x^2 + 9x - 6x^{-\frac{4}{3}} \right]$ .

**Solution:**  $8x^{-\frac{7}{3}} + 4x + 9$

**2.** (3 points) Compute using the quotient rule:  $\frac{d}{dx} \left[ \frac{5x^2}{\sqrt[4]{x}} \right]$ .

**Solution:** Compute

$$\frac{d}{dx} \left[ \frac{5x^2}{\sqrt[4]{x}} \right] = \frac{x^{\frac{1}{4}}(10x) - \frac{5}{4}x^2x^{-\frac{3}{4}}}{x^{\frac{1}{2}}}$$

**3.** (4 points) Compute using the product rule:  $\frac{d}{dx} [(7x + \sqrt[4]{x})(\sqrt[3]{x} + \sqrt[5]{x} + 1)]$ .

**Solution:** Compute

$$\begin{aligned} & \frac{d}{dx} [(7x + \sqrt[4]{x})(\sqrt[3]{x} + \sqrt[5]{x} + 1)] \\ &= \left( 7 + \frac{1}{4}x^{-\frac{3}{4}} \right) (\sqrt[3]{x} + \sqrt[5]{x} + 1) + \left( \frac{1}{3}x^{-\frac{2}{3}} + \frac{1}{5}x^{-\frac{4}{5}} \right) (7x + x^{\frac{1}{4}}). \end{aligned}$$