Math 121 Test 4 Print Name

1. Find the first derivative for the following functions (You do not need to simplify)

- **a**. $f(x) = 3x\sqrt[3]{(2x-1)^2}$
- **b**. $f(x) = \left(\frac{2x-3}{x-4}\right)^2$
- **c**. $f(x) = \sqrt[3]{(3x-1)^2}\,(2x-5)$
- **d**. $f(x) = 2x\sqrt{3x-2}$
- **e**. $f(x) = \sqrt{x(2x-3)}$
- **f**. $f(x) = \frac{2x-3}{x-4}$
- **g**. $f(x) = (3x-1)^2(2x-5)$
- **h**. More on product/quotient rules from the text, page 129, #23-37 odd numbers
- **i**. More on chain rule from the text, page 138, #23,25,27,55,57,59.

2. Discuss (**a**) the interval(s) where f is increasing or decreasing (**b**) the relative maximum or minimum of f if **the deriative** of the function f is given below.

- **a**. $f'(x) = \frac{x-1}{x-2}$
- **b**. $f'(x) = -(x+1)(x-3)(x-5)$
- **c**. $f'(x) = \frac{-2x-3}{\sqrt{x+5}}$

3. If $f(x) = 3\sqrt[3]{(2x-1)}$,

- **a**. find f'
- **b**. use f' to find the interval where f is increasing or decreasing
- **c**. use f' to find the relative maximum or minimum for f.

4. If $f(x) = \frac{2x-1}{x-3}$.

- **a**. find f'
- **b**. use f' to find the interval where f is increasing or decreasing
- **c**. use f' to find the relative maximum or minimum for f.

5. If $R(x) = \frac{-1}{3}x^3 + \frac{9}{2}x^2 - 14x$ represent the revenue function. Explain.

- **a**. Find the marginal revenue function.
- **b**. Use the **marginal revenue function** to estimate the revenue for the 29*th* unit.
- **c**. Find the number of units produced which will either maximize or minimize the revenue.