Math 151
Quiz 6
Fall 2008

Show all work in a neat and organized fashion. Clearly indicate your answers.
20 points possible.

1. (4 pts.) Graphical match-up on another page.

2. (5 pts.) Let $f(x) = 4x^4 - 8x^2 - 12$. Find the intervals of concavity.

3. (5 pts.) Find the limit (algebraic work required).

$$\lim_{x \to \infty} \frac{2 - 3x + x^2}{7 + 4x - 5x^2}$$

4. (6 pts.) Given:

$f(x) =$ some continuous function, defined for all real numbers (no asymptotes)

$$f'(x) = \frac{4x}{3\sqrt[3]{x^2-16}}, \qquad f''(x) = \frac{4(x^2-48)}{9\sqrt[3]{(x^2-16)^4}}$$

(a) Find the intervals on which f is increasing or decreasing.

(b) Find the x-coordinates of all local maxima and local minima of f.

(c) Find the intervals of concavity.

(d) Find the x-coordinates of all points of inflection.

Optional Bonus Problem. (5 optional bonus points possible)

Find the limit (algebraic work required).

$$\lim_{x \to \infty} (\sqrt{2x^2 + 3x} - \sqrt{2x^2 - 5})$$