Names: _____ _____ _____

Activity #6: Monotonicity and Concavity **Calculus I**

1. Find the interval(s) over which the following function is increasing or decreasing.

$$f(x) = x - 6\sqrt{x-1}$$

2. Find the interval(s) over which the following function is increasing or decreasing.

$$g(x) = \frac{x-2}{x^2-1}$$

3. Find the interval(s) over which the following function is concave up or concave down.

$$f(x) = x^5 - 5x^4$$

What are the inflection points of the graph of f?

4. Consider the function $f(x) = ax^3 + bx^2 + cx + d$, where a, b, c, and d are (unknown) constants and $a \neq 0$.

   (a) What are the critical points of f?

   (b) Find specific values of a, b, c, and d so that f has exactly 0, 1, and 2 critical points.