Name: _____

Curve Sketching

1) Use first derivative (increasing/decreasing intervals) to graph

   1. $f(x) = x^3 - 6x^2$

   2. $f(x) = x\left(x^2 - 9\right)$

2) Use second derivative (concavity/point of inflection) to graph

   1. $f(x) = x^3 - 6x^2 - 12x + 2$

   2. $f(x) = x^4 - 8x^2$

3) Use the Second Derivative Test to find any local extrema of the function

   1) $f(x) = 2x^2(1 - x^2)$

   2) $f(x) = 4x^2 - x^4$

4) Given the function $f(x) = 4x^2 + 3x - 1$

   1) Write the function that gives the rate at which f is changing with respect to x at any point.

   2) At what rate is f changing with respect to x when x = -1?

   3) Is the function increasing or decreasing as it passes through x = -1? How do you know?

   4) At what rate is f changing with respect to x when x = 1? Is the function increasing or decreasing? How do you know?

   5) What is the actual change of the function as x changes from 1 to 2?