EXAM 2 - MATH 112   Friday, October 10

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Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Create the sign table for the first and second derivatives of $f(x) = x^3 - 9x^2 + 15x + 25$ and, using the arrows in the last line, indicate clearly the relative extrema and the inflection points. (You do not need to sketch the graph.)

2. Create the sign table for the first and second derivatives and roughly sketch the graph of the function $f(x) = 9\sqrt[3]{x^2} - 6x$.

3. Find the absolute maximum and the absolute minimum of the function $f(x) = \frac{x}{x^2+1}$ in the closed interval $[-3, 2]$.

4. A homeowner wants to build along her driveway a garden surrounded by a fence. If the garden is to be 5000 square feet and the fence along the driveway costs $ 6.00 per foot while on the other three sides it costs only $2.00 per foot, what are the dimensions of the garden that will minimize the fencing cost?

5. Use implicit differentiation to find an equation for the tangent line to the graph of $x^2 y^2 - xy = 2$ at the point $(x, y) = (-1, 1)$.