EXAM 2 - MATH 112   Friday, February 22

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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 the function $f(x) = x(x-2)^3$ clearly showing intervals of monotonicity, relative max/min points, intervals of concavity and inflection points. Then, roughly **sketch the graph** of f, clearly labeling all points of interest.

2. Find the domain, the vertical and the horizontal asymptotes and make the sign table for the first derivative (clearly showing intervals of monotonicity and relative max/min points) of the function $f(x) = \dfrac{x(x-2)}{(x-1)^2}$. You do not have to sketch its graph.

   Dom$(f) =$

   Vertical Asymptote(s):

   Horizontal Asymptote:

   $f'(x) =$

3. Find the absolute max and the absolute min values of the function $f(x) = x^4 - 4x^3 - 8x^2 + 64$ in the closed interval $[-1, 2]$.

4. An open-top box with a square base is to have a volume of exactly 500 cubic inches. Find the dimensions of the box that can be made with the smallest amount of materials.

5. A computer dealer can sell 12 personal computers per week at a price of $500 each. He estimates that each $100 decrease is price will result in 3 more sales per week. If the computers cost him $300 each, what price should he charge to maximize his profit? How many computers will he be selling at that price?

   Revenue Function:

   Cost Function:

   Profit Function: