Math 2413- **Calculus I** ***Homework*** *Sec*–3.1 & 3.2 **Name**:

Find the critical points of the following functions on the given intervals. Identify the absolute maximum and minimum values (if they exist).

1. $f(x) = 2x^3 - 3x^2 - 36x + 12 \quad on \quad (-\infty, \infty)$

2. $f(x) = 2x \ln x + 10 \quad on \quad (0, 4)$

Sketch the graph

3. $f(x) = \frac{1}{2}x^4 - 3x^2 + 4x + 1$

4. $f(x) = \frac{\cos \pi x}{1 + x^2} \quad on \ [-2, 2]$

5. $f(x) = x(x-1)e^{-x}$