## QUIZ 3 - MATH 111 YOUR NAME:

Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to **show all your work**. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Consider the function

$$f(x) = \frac{1}{4}x^4 - 3x^3 + 12x^2 - 15x + 1.$$

in the interval [-2, 8]. Our goal is to study in detail the graph y = f(x). Please, follow the directions given closely and answer the following questions precisely.

(a) Graph y = f(x) with your calculators setting your window for x between -2 and 8 and for y between -10 and 20. Reproduce your graph **carefully** here.

- (b) What is the initial value for f in [-2, 8]? If the graph is allowed to evolve further to the right outside [-2, 8] does it have a limiting value?
- (c) Find the intervals of monotonicity (intervals where graph is increasing/decreasing) and the local extrema in [-2, 8]. Summarize your results in a small table.

(d) Find the intervals of concavity (intervals where graph is concave up/concave down) and the inflection points in [-2, 8]. Summarize your results in a small table.