PRACTICE EXAM 2 - MATH 111 DATE: Friday, February 18 INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Consider the piece-wise defined function $f(x) = \begin{cases} |x+1|, & \text{if } x < 3\\ 6-x, & \text{if } x \ge 3 \end{cases}$

- (a) Provide a new formula for f(x) that does not contain an absolute value.
- (b) Use the new formula and the table of values method to roughly sketch the graph of f(x).
- 2. Suppose that the demand and price for the HBO cable channel are related by p = -0.5q + 30.95, where p is the monthly price in dollars and q is measured in millions of subscribers. If the price and supply are related by p = 0.3q + 2.15, what are the equilibrium quantity and price?
- 3. Perform the following steps in the order requested: Find the vertex, the opening direction, the intercepts and roughly sketch the graph of the function $f(x) = -x^2 + 5x 4$.
- 4. The height h(t) in feet of a rocket at time t seconds after liftoff is given by $h(t) = -16t^2 + 800t$.
 - (a) Find how long it will take the rocket to reach 3200 feet.
 - (b) Find the maximum height that the rocket can reach.
- 5. Perform the following steps in the order requested: Find the intercepts, create the sign table and then roughly sketch the graph of the polynomial function $f(x) = (x^2 - 4)(x^2 - 9)$.
- 6. Perform the following steps in the order requested: Find the domain, the intercepts, create the sign table, find the asymptotes and then roughly sketch the graph of the polynomial function $f(x) = \frac{x^2 2x 3}{x^2 + x 2}$.