## EXAM 2 - MATH 111

## DATE: Monday, October 11

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. Use the small table method to graph the function

$$f(x) = \begin{cases} -|x+1| + 5, & \text{if } x \le 1\\ 2x - 3, & \text{if } x > 1 \end{cases}$$

- 2. Study (find vertex, opening direction, intercepts and roughly graph) the function  $f(x) = -x^2 4x + 5$ .
- 3. Find the equation of the parabola with vertex V = (2,5) and goes through (-1,3).
- 4. Your uncle, who is a farmer, wants to find the best time to take his hogs to the market. He knows that you are taking George's Math 111<sup>®</sup> and comes to you for help. He informs you that the current price is 88 cents per pound and his hogs weigh an average of 90 pounds. The hogs gain 5 pounds per week and the market price for hogs is falling each week by 2 cents per pound. Your uncle asks how many weeks he should wait before taking his hogs to the market in order to maximize his revenue under the circumstances. He promises generous help with your college tuition if you give him good advice.<sup>1</sup>
- 5. Use the table method to roughly sketch the graph of the polynomial function  $f(x) = -x^3 3x^2 + 4x$ .
- 6. Study (find domain, intercepts, asymptotes, make sign table and roughly graph) the rational function  $f(x) = \frac{x^2 + x 6}{x^3 2x^2 + x}$ .

<sup>&</sup>lt;sup>1</sup>Hint: Find an expression giving the revenue R(x) in terms of the number x of weeks that your uncle will wait. Then maximize R(x).