HOMEWORK 3 - MATH 111 DUE DATE: Monday, February 7 INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 1 point. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

- 1. Graph the function $f(x) = \begin{cases} 3-x, & \text{if } x < -1\\ 2x+3, & \text{if } x \ge -1 \end{cases}$
- 2. Graph the absolute value function f(x) = |3 5x|.
- 3. The profit in millions of dollars from the sale of x million units of an item is given by P(x) = x 25. The cots is given by $C(x) = \frac{7}{5}x + 25$.
 - (a) Find the equation for the revenue R(x).
 - (b) What is the revenue when 10 million units are sold?
 - (c) What is the break-even point?
- 4. Let the supply and the demand for sugar be given by $S(q) = \frac{7}{5}q \frac{3}{5}$ and $D(q) = -2q + \frac{16}{5}$, respectively, where S(q) and D(q) are in dollars.
 - (a) Find the equilibrium supply.
 - (b) Find the equilibrium price.
 - (c) On what interval does supply exceed demand?
- 5. Find the vertex, the opening direction, the intercepts and sketch the graph of the function $f(x) = x^2 + 10x 24$.
- 6. Find the vertex, the opening direction, the intercepts and sketch the graph of the function $f(x) = -x^2 2x + 8$.
- 7. Find the equation of the parabola with vertex V = (2, -4) going through the point (7, 1).
- 8. There are many parabolas that have x-intercepts (-1,0) and (5,0).
 - (a) Find the equation f(x) of one of these parabolas.
 - (b) Use the sign table to solve the inequality $f(x) \leq 0$.