## EXAM 1 - MATH 140 DATE: Friday, January 28 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. Find the equation of the line that passes through (-1, 2) and is perpendicular to the line through (1, 5) and (5, -7).
- 2. Find the center and the radius of the circle represented by the equation  $2x^2 + 2y^2 + 8x + 7 = 0.$
- 3. A candy store sells boxes of candy containing caramels and cremes. Each box sells for \$ 12.50 and holds 30 pieces of candy. If the caramels cost \$ 0.25 to produce and the cremes cost \$ 0.45 to produce, how many of each should be in a box to make a profit of \$ 3.00?
- 4. Study (find the vertex, the opening direction, the intercepts and then roughly sketch the graph of) the function  $f(x) = -4x^2 6x + 2$ .
- 5. (a) Find the equation y = f(x) of the parabola with vertex V = (-1, 4) going through the point (2, -5).
  - (b) Solve the inequality  $f(x) \ge 0$ .
- 6. David has available 400 yards of fencing and wishes to enclose a rectangular area.
  - (a) Find a function A(x) for the area of the rectangle as a function of the width x of the rectangle.
  - (b) For what value of x is the area largest?
  - (c) What is the maximum area?