HOMEWORK 1 - MATH 140 DUE DATE: Wednesday, September 7 INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. One part of each homework problem will be chosen at random and graded. Each question is worth 1 point. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

- 1. (a) Find the roots of the equation $x^3 7x^2 4x + 28 = 0$ by factoring.
 - (b) Solve the linear inequality $5x + 2 > -\frac{1}{3}(x+1)$ and graph the solution set.
- 2. Find the distance between the two points P = (-3, -1) and Q = (-1, 7). Then find the midpoint of the line segment \overline{PQ} .
- 3. Find the intercepts of 2x 5y = 30 and then use them to sketch its graph.
- 4. Find the center and the radius of the circle with equation $x^2 + y^2 + 6x 2y + 9 = 0.$
- 5. Test for symmetry with respect to the x-axis, the y-axis and the origin the equation $y^2 = x$. Describe in detail the test you are performing each time.
- 6. Consider the function $f(x) = \frac{3x-6}{x+2}$.
 - (a) Is $(3, \frac{5}{3})$ on the graph of f?
 - (b) If x = 1 what is f(x)?
 - (c) Find the domain of f.
 - (d) Find the x- and the y-intercepts of the graph of f.
- 7. Find the domain, symmetry, monotonicity and local extrema of the function y = f(x) whose graph is sketched below.

8. Use your calculators to graph the function $f(x) = \frac{1}{3}x^3 - x$. Then find for this graph the domain, symmetry, monotonicity and local extrema.