## HOMEWORK 5 - MATH 140 DUE DATE: Monday, March 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. Let  $f(x) = \frac{2-x}{3x-7}$  and  $g(x) = \sqrt{x-1}$ . Find the domain and give a formula for the composite function  $g \circ f$ .
- 2. Does the function  $f(x) = (x 3)^2$  have an inverse? Explain. If not, restrict its domain so that it does. Find its inverse  $f^{-1}(x)$  and the domain  $\text{Dom}(f^{-1})$ .
- 3. Consider the function  $f(x) = \frac{4x-3}{7x+5}$ . Find its domain, its inverse  $f^{-1}$  and its range.
- 4. Use your basic exponential graphs together with graphing techniques to plot the graph of the function  $f(x) = -3^{x+2}$ .
- 5. Solve the basic exponential equations
  - (a)  $(\frac{1}{3})^{3-5x} = 27$ (b)  $(e^4)^x e^{x^2} = e^{12}$
- 6. Use your basic graphs of logarithmic functions and your graphing techniques to find the domain, the range, the asymptote and to graph the function  $f(x) = \log_{1/2} (5 x)$ .
- 7. Find the domain of the function  $f(x) = \log_{2005} (\frac{x+2004}{2006-x})$ .
- 8. Solve the following logarithmic equations
  - (a)  $\log_6 36 = 5x + 3$
  - (b)  $\log_5(x^2 + x + 4) = 2$