

**MATH 301/501 HOMEWORK 2—DUE AT THE BEGINNING OF CLASS ON
TUESDAY, SEPTEMBER 15**

One goal for this course is for you to develop your skill in effectively communicating mathematics. With this in mind, you should clearly write up your solutions. A solution with little or no justification will receive little or no credit.

- (1)
 - (a) Without multiplying out the binomial $(x + 4)^2$, determine the solutions to $(x + 4)^2 - 2 = 7$.
 - (b) What is the solution set of $x = \sqrt{3x + 40}$?
 - (c) Explain why there are two solutions in part (a) and one solution in part (b).
- (2)
 - (a) Write the definition for a hyperbola, which we gave in class.
 - (b) Use this definition to determine the equation for a hyperbola.
 - (c) Once you have the equation, explain what information this equation, as written, gives you about the graph.
 - (d) What would be the equation of a translation of your hyperbola, by 3 units up and 2 units left.
 - (e) The graph of the function $y = 1/x$ is a hyperbola. What is the equation of graph you obtain by rotating $y = 1/x$ through an angle of $\pi/4$.