MATH 149

Spring 2011

Final Exam

This exam has to be typed, with pictures drawn on a computer as well, not drawn by hand and scanned. You may use any software you like. LaTeX, Word, Geometer's Sketchpad, GeoGebra, Mathematica, and Maple are some possible choices. Turn it in via email (`mnogin@csufresno.edu`) no later than on Wednesday, May 18, 2011.

1. (7 points) Explain why a decimal represents a rational number if and only if it is either terminating or repeating.
2. (4 points) Two triangles are similar. One triangle has sides 4, 5, and 6. Two sides of the other triangle are 10 and 15. What is the third side of the second triangle?
3. (6 points) Solve each of the following inequalities in two different ways:
   (a) $x^2 - 4x + 3 \leq 0$
   (b) $x^2 + 4x + 4 > 0$
   (c) $\dfrac{1}{(x-3)^2} > 4$
4. (8 points) Prove the Pythagorean Theorem in four different ways.