AME 20214
Homework 9
Due: Thursday, 8 November 2012, in class

1. Write a program to generate a well-resolved elegantly prepared plot of all of the real roots of

$$ax^2 - 3x + 2 = 0,$$

for $a \in [-1, 2]$. Give your plot with a on the abscissa and x on the ordinate. Take care that your plot reflects the mathematics correctly near $a = 0$ and filters any obviously numerical artifacts.

You can either write a single program to calculate the roots and run the program many times or, if you are ambitious, can read ahead and write a subroutine to calculate the roots and have the main program calculate the roots for various a in one run of the program. Use only `real` or `integer` variables, and make effective use of control statements such as `if`.

2. Repeat the previous exercise using `complex` variables as appropriate. Use your program to generate a well-resolved elegantly prepared plot of all of the real roots of

$$ax^2 - 3x + 2 = 0,$$

for $a \in [-1, 2]$. Give your plot with a on the abscissa and x on the ordinate.

Prepare your homework with the LaTeX text processor. Include at least one equation. Write with concision and precision (but not derision!). Three page maximum. Include `verbatim` listings of your codes.