MA121, Homework #1
due Tuesday, Oct. 30 in class

1. Show that the product of two negative real numbers is positive.

2. Show that $x + \frac{1}{x} \geq 2$ for every real number $x > 0$.

3. Show that the set $A = \{x \in \mathbb{R} : |2x - 3| < 1\}$ has no maximum.

4. Show that the set $B = \{-2x^2 + 3x : x \in \mathbb{R}\}$ has a maximum and find it explicitly.

5. Show that the set $C = \{\frac{n+1}{n} : n \in \mathbb{N}\}$ is such that $\inf C = 1$.

6. Show that the set $D = \{x \in \mathbb{R} : x^2 \geq x\}$ has no supremum.

- You are going to work on these problems during your Friday tutorials.

- When writing up solutions, write legibly and coherently. Use words, not just symbols.

- Write both your name and your tutor's name on the first page of your homework.

- Your tutor's name is Derek, if you are a TP student; otherwise, it is Pete.

- Your solutions may use any of the axioms/results stated in class (but nothing else).