HOMEWORK FOR 18.100B AND 18.100C, SPRING 2007
DUE THURSDAY 8 FEB, AT 11:00 IN 2-108.

Since you will have had only one lecture by the time this homework is due, it is very short. Although there are three questions they are very closely related! To get full marks you must write out the arguments needed carefully, succinctly and completely.

(1) Show that there is no rational number, q, with the property that $q^2 = 3$.
(2) Using the supremum property of the real numbers show that the set of rational numbers ($\mathbb{Q}$ denotes the set of rational numbers)
$$A = \{q \in \mathbb{Q}; q > 0,\ q^2 < 3\}$$
has a supremum as a set of real numbers.
(3) Denoting the real number in (2) by $x = \sup A$, show that $x^2 = 3$.