MAT 141
ASSIGNMENT 3

DUE SEPT 20, 2005

Please write proofs (or at least some reasoning if you can't give a full proof), not just answers! So if a problem asks whether some set has a maximum, do not just write "No", write "No, it doesn't because..."

As usual, you are allowed all the theorems stated in the appropriate chapters of the book (whether or not we have discussed them in class).

Notation:

$\mathbb{Z}$ – set of integer numbers

$\mathbb{P}$ – set of positive integer numbers

$\mathbb{Q}$ – set of rational numbers

(1) Prove existence of $\sqrt[3]{2}$

(2) Section I 4.4, problem 1 b, c

(3) Section I 4.4, problem 3

(4) Section I 4.7, problem 11 a, b, e

(5) Section I 4.7, problem 12

(6) Let $0 < x < y$. Prove by induction in n that for any $n \in \mathbb{P}$, $x^n < y^n$.