Math 3000 Homework due November 11

1. Let $f : \mathbf{R} \to \mathbf{R}$ be the function given by $f(x) = 2x^2 + 3x - 7$. Show that f is continous at
   a. 2
   b. 5
   c. a for any $a \in \mathbf{R}$

2. Let $f : [0, \infty) \to \mathbf{R}$ be given by $f(x) = \sqrt{x}$. Prove that f is continous at 4.

3. Let $f : \mathbf{R} - \{0\} \to \mathbf{R}$ be given by $f(x) = \frac{1}{x}$. Prove that f is continous at 1.

4. Let $g : \mathbf{R} \to \mathbf{R}$ be given by $g(x) = x^3$.
   a. Prove that g is continous at 2.
   b. Prove that g is continous at a for any $a \in \mathbf{R}$.
   c. Prove that for any $r \in \mathbf{R}$, there is a number $z \in \mathbf{R}$ such that $z^3 = r$.