The usual Friday Quiz; covering the same material as the group work.

Prove the following:

1) If $x_n \to 0$ then $x_n^2 \to 0$.

2) Assume $x_n \to x$. Assume for all $\epsilon > 0$ there exists an $M$ with $n \geq M$ implies $|x_n - y_n| < \epsilon$.
   Then $y_n \to x$.

3) Assume $x_n$ is bounded. Assume $x_n + y_n$ is unbounded.
   Then $y_n$ is unbounded.

4) Assume that for all $n$, $x_n < y_n$.
   Assume that $x_n$ converges to $x$, $y_n$ converges to $y$.
   Prove that $x \leq y$. Give an example where in fact $x = y$. 