Math 325. Quiz #4

(1) State the definition for a sequence $\{a_n\}_{n=1}^{\infty}$ to **converge** to a real number L.

(2) *True or false*, and *justify* with a short proof or example:
If $\{a_n\}_{n=1}^{\infty}$ converges to L, then $a_n = L$ for some natural number n.

(3) *True or false*, and *justify* with a short proof or example:
If $\{a_n\}$ converges to 3, then there is some natural number N such that for every natural number $n > N$, we have $a_n > 2.5$.

Bonus: *True or false*, and *justify*[1] with a short proof or example:
There is a rational number $r \in \mathbb{Q}$ such that $|r^2 - 3| < \dfrac{1}{1000000}$.

[1] You can cite any facts we proved in class or on the homework, but not things we haven't, like decimal expansions