HOMEWORK #7

3.2.6. Suppose that $f : [0, 1] \rightarrow \mathbb{R}$ and $f(a) = \lim_{x \to a} f(x)$ for all $a \in [0, 1]$. Prove that $f(q) = 0$ for all $q \in \mathbb{Q} \cap [0, 1]$ if and only if $f(x) = 0$ for all $x \in [0, 1]$.

3.3.1b. Use limit theorems to show that the function

$$f(x) = \begin{cases} 
\frac{x^2 + x - 2}{x - 1} & x \neq 1 \\
0 & x = 1
\end{cases}$$

is continuous on $[0, 1]$. 