Problem 1. A continuous random variable $Q$ has the probability density function

$$f_Q(t) = \begin{cases} 
0 & t \leq 0 \\
2x & 0 < t < 1 \\
0 & 1 \leq t.
\end{cases}$$

Find $E(Q)$ (the mean, or expected value, of $Q$) and the median of $Q$. 

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