The current flowing through an element is
\[ i = \begin{cases} 
4A & 0 < t < 1s \\
4t^2 A & t > 1s 
\end{cases} \]

Calculate the charge entering the element from \( t = 0 \) to \( t = 2s \).

\[ q = \int_{0}^{1} 4 \, dt + \int_{1}^{2} 4t^2 \, dt = 4t \bigg|_{0}^{1} + \frac{4t^3}{3} \bigg|_{1}^{2} \]
\[ = 4(1-0) + \frac{4}{3} (8-1) \]
\[ q = 13.33 \, C \]