1. Sketch the voltage which develops across the terminals of a 0.25 F capacitor in response to the current waveforms shown in the following figure.

\[ V(t) = \frac{1}{C} \int_{0}^{t} i(t) \, dt + V(t_0) \]

\[ V(t) = \begin{cases} 
0 & t \leq 0 \\
4t & 0 < t < 1 \\
8 & t \geq 1 
\end{cases} \]

2. For an inductor with \( L = 20 \) mH, determine the voltage for \( t \geq 0 \) if the current is \( 10e^{-2t} \) A.

\[ V = L \frac{di}{dt} \]

\[ \frac{di}{dt} = \frac{d(10te^{-2t})}{dt} = 10e^{-2t} - 20te^{-2t} \]

\[ V = 0.02 \times 10e^{-2t} (1 - 2t) \]

\[ V = 0.2e^{-2t}(1 - 2t) \]