Chapter 7, Solution 69.

Let v_x be the capacitor voltage.
For $t < 0$, $\quad v_x(0) = 0$

For $t > 0$, the 20 kΩ and 100 kΩ resistors are in series and together, they are in parallel with the capacitor since no current enters the op amp terminals. As $t \to \infty$, the capacitor acts like an open circuit so that

$$v_o(\infty) = \frac{-4}{10}(20 + 100) = -48$$

$$R_{th} = 20 + 100 = 120\ \text{k}\Omega, \qquad \tau = R_{th}C = (120 \times 10^3)(25 \times 10^{-3}) = 3000$$

$$v_o(t) = v_o(\infty) + \left[v_o(0) - v_o(\infty) \right] e^{-t/\tau}$$

$$v_o(t) = -48\left(1 - e^{-t/3000}\right) \text{V} = \mathbf{48(e^{-t/3000} - 1)u(t)V}$$