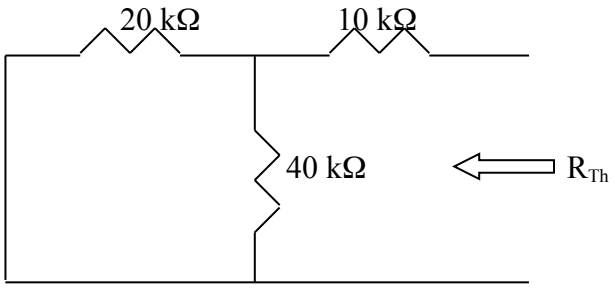
Chapter 7, Solution 45.

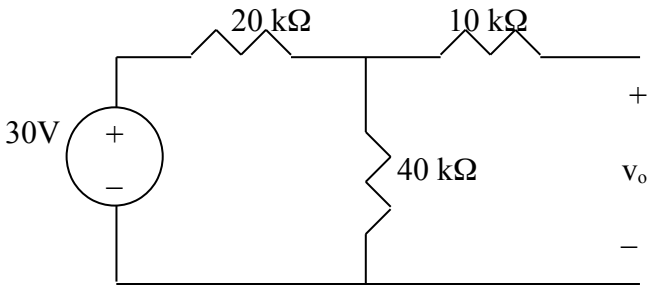
To find R_{Th}, consider the circuit shown below.



$$R_{Th} = 10 + 20 // 40 = 10 + \frac{20x40}{60} = \frac{70}{3} k\Omega$$

$$\tau = R_{Th}C = \frac{70}{3} x10^{3} x3x10^{-6} = 0.07$$

To find $v_o(\infty)$, consider the circuit below.



$v_o(\infty) = [40/(40+20)]30 = 20$ V

$$v_o(t) = v_o(\infty) + [v_o(0) - v_o(\infty)]e^{-t/0.07} = \mathbf{[20 - 15e^{-14.286t}]u(t)\ V}.$$