Ex: Find the voltage, $v_C$, across the capacitor in the circuit below for $t > 0$ if $v_C(t = 0) = 100 \, \mu V$.

$C = 150 \, \mu F$

$$R = 3 \, k\Omega$$

Sol'n: The form of solution is an exponential.

$$v_C(t) = Ae^{-t/RC}$$

The value of the constant, $A$, is chosen to match the initial voltage on C, since the exponential has a value of unity at $t = 0$: $e^0 = 1$.

$$v_C(t) = 100 \, \mu V \cdot e^{-t/450 ms}$$