

Question #3

Ohm's law, $V = IR$ — (1)

Differentiate (1) w.r.t. to 't' as

$$\begin{aligned}\frac{dV}{dt} &= I \frac{dR}{dt} + R \frac{dI}{dt} \quad (\text{Product Rule}) \\ &= I(-1) + R(0.5) \quad \text{--- (11)}\end{aligned}$$

$$V = IR$$

When, $V = 110$, $R = 75$, then

$$I = \frac{V}{R} = \frac{110}{75} = \frac{22}{15}$$

Therefore, from (11),

$$\begin{aligned}\frac{dV}{dt} &= \frac{22}{15}(-1) + 75(0.5) \\ &= -\frac{22}{15} + \frac{75}{2} \\ &= \frac{1081}{30} \approx \underline{\underline{36.03}}\end{aligned}$$