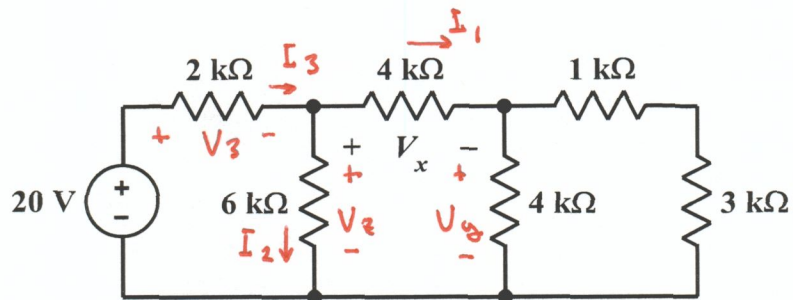


EE 2240
Problem #08

Find V_x .



$$4k\Omega \parallel (1k\Omega + 3k\Omega) \\ = 2k\Omega$$

$$I_1 = \frac{V_x}{4k\Omega}$$

$$V_y = (2k\Omega) I_1 = \frac{1}{2} V_x$$

$$V_2 = V_x + V_y = \frac{3}{2} V_x$$

$$I_2 = \frac{V_2}{6k\Omega} = \frac{1}{4000} V_x$$

$$I_3 = I_1 + I_2 = \frac{V_x}{4000} + \frac{V_x}{4000} = \frac{V_x}{2000}$$

$$V_3 = (2k\Omega) I_3 = V_x$$

$$V_3 + V_2 = 20V \quad (\text{KVL})$$

$$\Rightarrow V_x + \frac{3}{2} V_x = 20$$

$$\frac{5}{2} V_x = 20$$

$$V_x = 8V$$