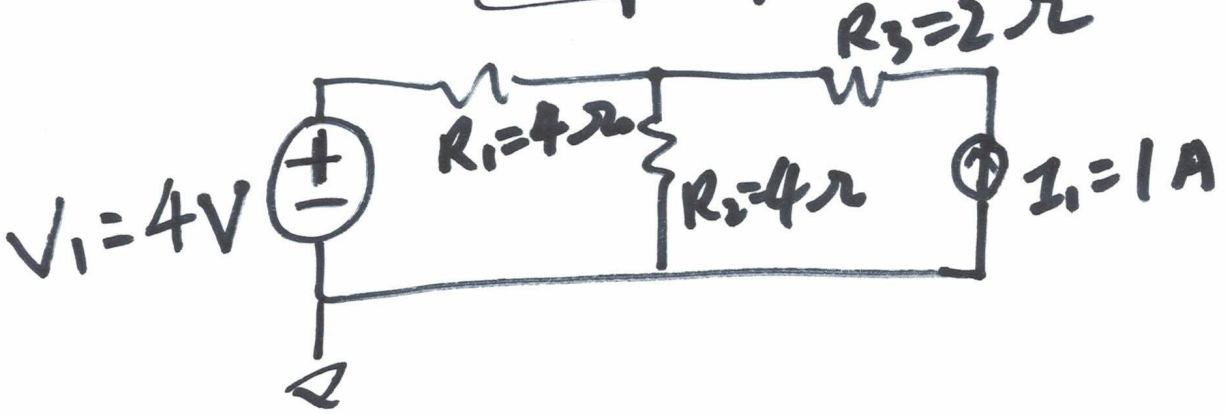
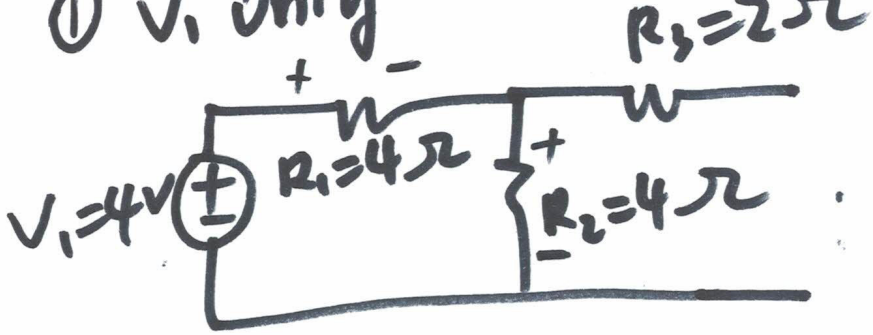
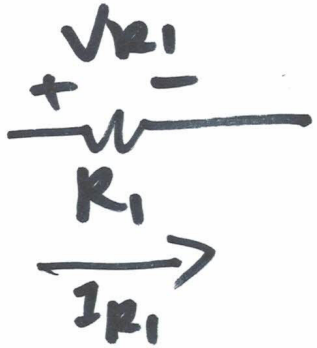
Superposition – Part 3

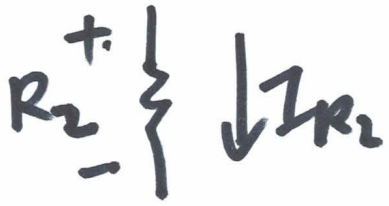


① V_1 only



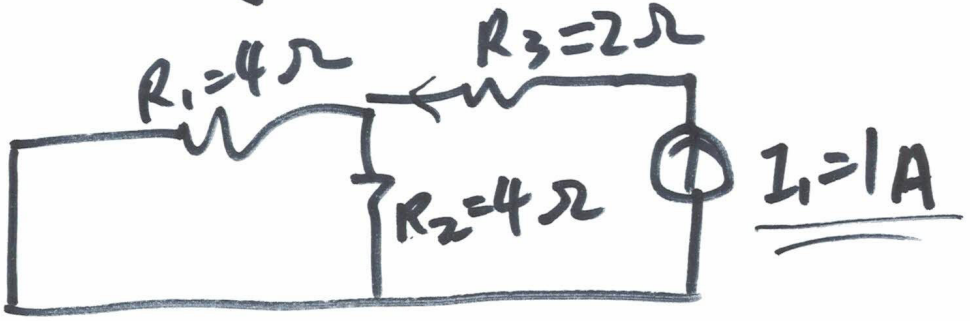


$$V_{R_1} = V_1 \cdot \frac{4}{4+4}$$
$$= 2V$$
$$I_{R_1} = \frac{V_{R1}}{R_1} = \frac{2V}{4\Omega}$$
$$= 0.5A$$



$$V_{R_2} = V_1 \cdot \frac{4}{4+4}$$
$$= 2V$$
$$I_{R_2} = \frac{V_{R_2}}{R_2}$$
$$= \frac{2V}{4\Omega} = 0.5A$$

② I_1 only



R_1

I_{R_1}

$V_{R_1} = 0.5A \cdot 4\Omega = 2V$

$I_{R_1} = 0.5A$

R_2

I_{R_2}

$V_{R_2} = 0.5A \cdot 4\Omega = 2V$

$I_{R_2} = 0.5A$

R_3

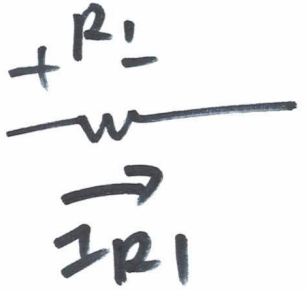
I_{R_3}

$V_{R_3} = 1A \cdot R_3 = 1 \cdot 2 = 2V$

$I_{R_3} = 1A$

So In total:

$$V_{R_1} = 2V - 2V = 0$$

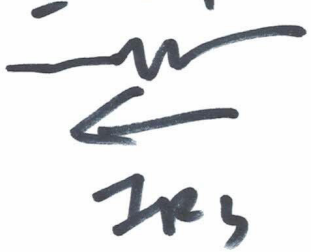


$$I_{R_1} = \frac{V_{R1}}{R_1} = 0A$$

$$V_{R_2} = 2V + 2V = 4V$$

$$I_{R_2} = \frac{V_{R2}}{R_2} = \frac{4V}{4\Omega} = 1A$$

$$V_{R_3} = 2V$$



$$\therefore I_{R_3} = 1A$$