

Ch10 Dwb79

a) Switch is open

$R_1 + R_4$ are in series

$$R_6 = R_1 + R_4 = 8\Omega + 8\Omega = 16\Omega$$

$R_2 + R_3$ are in series

$$R_7 = R_2 + R_3 = 8\Omega + 8\Omega = 16\Omega$$

$R_6 + R_7$ are in parallel

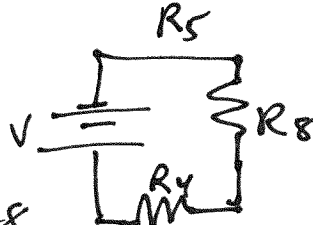
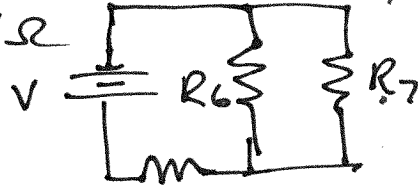
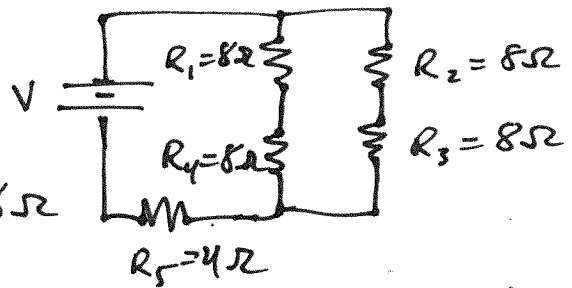
$$\frac{1}{R_8} = \frac{1}{R_6} + \frac{1}{R_7} = \frac{1}{16} + \frac{1}{16} = \frac{2}{16}$$

$$R_8 = 8\Omega$$

total resistance is $R_{TOT} = 4 + 8$

$$= 12\Omega$$

$$V = IR \rightarrow I = \frac{V}{R} = \frac{12V}{12\Omega} = 1A$$



b) Switch is closed

$R_1 + R_2$ are in parallel

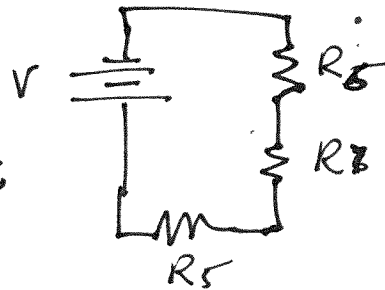
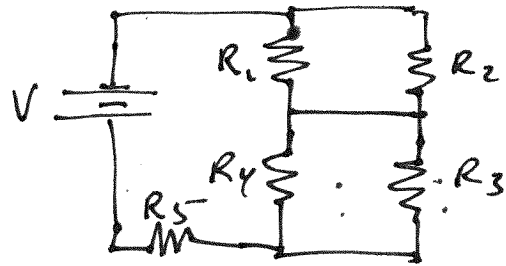
$$\frac{1}{R_6} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{8} + \frac{1}{8} = \frac{2}{8}$$

$$R_6 = 4\Omega$$

$R_3 + R_4$ are in parallel

$$\frac{1}{R_7} = \frac{1}{R_3} + \frac{1}{R_4} = \frac{1}{8} + \frac{1}{8} = \frac{2}{8}$$

$$R_7 = 4\Omega$$



~~All the resistors are~~

$R_5, R_6 + R_7$ are all in series

total resistance is $R_{TOT} = R_5 + R_6 + R_7 = 4 + 4 + 4 = 12\Omega$

$$I = \frac{V}{R} = \frac{12V}{12\Omega} = 1A$$