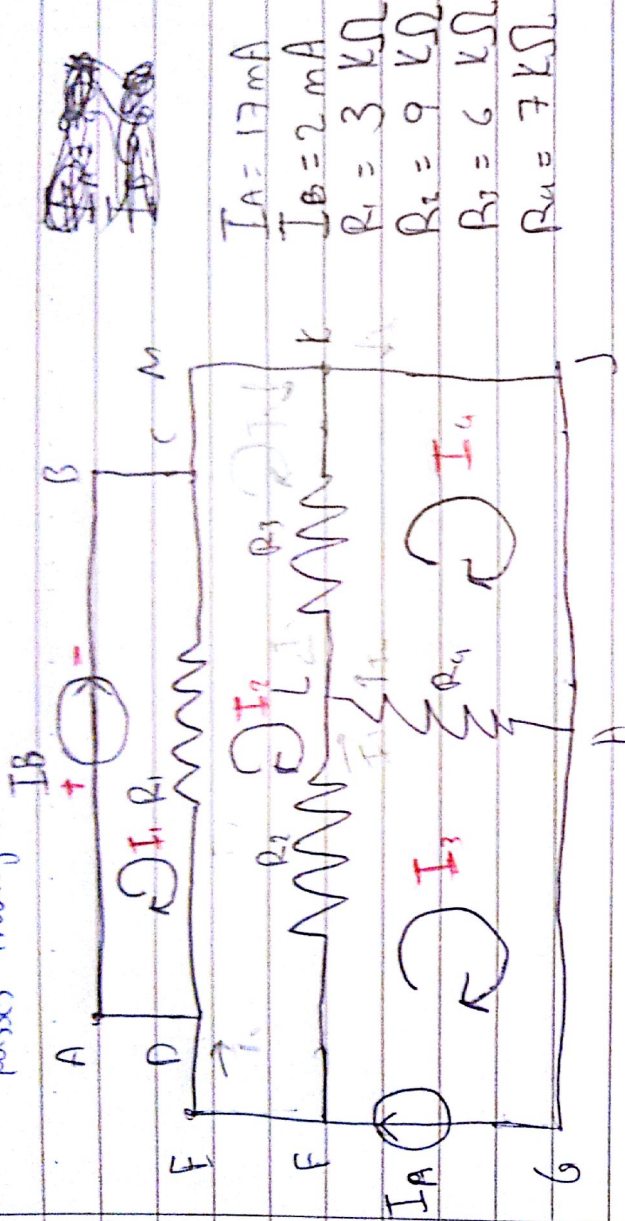


For every resistance find the current that passes through.



For ABCDA from Kirchhoff's law:

- We assume the current of R_1 is defined with direction from \odot to \odot left to right.

$$\text{So: } -V_B - I_1 R_1 + I_2 R_1 = 0 \Rightarrow 3I_2 - 3I_1 - V_B = 0$$

For FMRFE

$$(I_2 - I_1)3 + (I_4 - I_2)6 + (I_3 - I_2)9 = 0 \quad (2)$$

For LKJAL

$$6(I_4 - I_2) + (I_4 - I_3)7 = 0 \quad (3)$$

For mesh D

$$I_2 = I_1 + I_B \quad (4)$$

For mesh F

$$I_A = I_3 + I_4 \quad (5)$$

- So: $17 = I_3 + I_4 \Rightarrow I_3 = 17 - I_4$ (6)

(3) $\Rightarrow 6(I_4 - I_2) + (I_4 - 12 + I_4)/7 = 0 \Rightarrow$

$6(I_4 - I_2) + (2I_4 - 12)/7 = 0 \Rightarrow$

$6I_4 - 6I_2 + 14I_4 - 119 = 0 \Rightarrow -6I_2 + 20I_4 - 119 = 0$ (7)

(2) $\Rightarrow (I_2 - I_2 + 2)3 + (I_4 - I_2)6 + (17 - I_4 - I_2)/9 = 0$

$\Rightarrow 6 + 6I_4 - 6I_2 + 153 - 9I_4 - 9I_2 = 0 \Rightarrow$

$-15I_2 - 3I_4 + 159 = 0$ (8)

From (7), (8):

$I_2 = \frac{20I_4 - 119}{6}$

$-15 \left(\frac{20I_4 - 119}{6} \right) - 3I_4 + 159 = 0 \Rightarrow$

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$-50I_4 + 297,5 - 3I_4 + 159 = 0 \Rightarrow$

$-53I_4 = -456,5 \Rightarrow I_4 = 8,6 \text{ mA}$

So $I_2 = 8,83 \text{ mA}$

$I_1 = 6,83 \text{ mA}$

and $I_3 = 8,6 \text{ mA}$

So $R_1 \rightarrow I_1 = I_2 - I_1 = 2 \text{ mA}$ or $|I_1| = 2 \text{ mA}$

$R_2 \rightarrow I_2 = I_3 - I_2 = -0,43 \text{ mA}$ or $|I_2| = 0,43 \text{ mA}$

$R_3 \rightarrow I_3 = I_4 - I_2 = -0,23 \text{ mA}$ or $|I_3| = 0,23 \text{ mA}$

$R_4 \rightarrow I_4 = I_4 - I_3 = 0,2 \text{ mA}$ or $|I_4| = 0,2 \text{ mA}$