Two resistors of 4Ω and 6Ω are connected in parallel circuit. The total amount of current flowing in the circuit is 30 Ampere. Find the current of each resistor.

Solution:
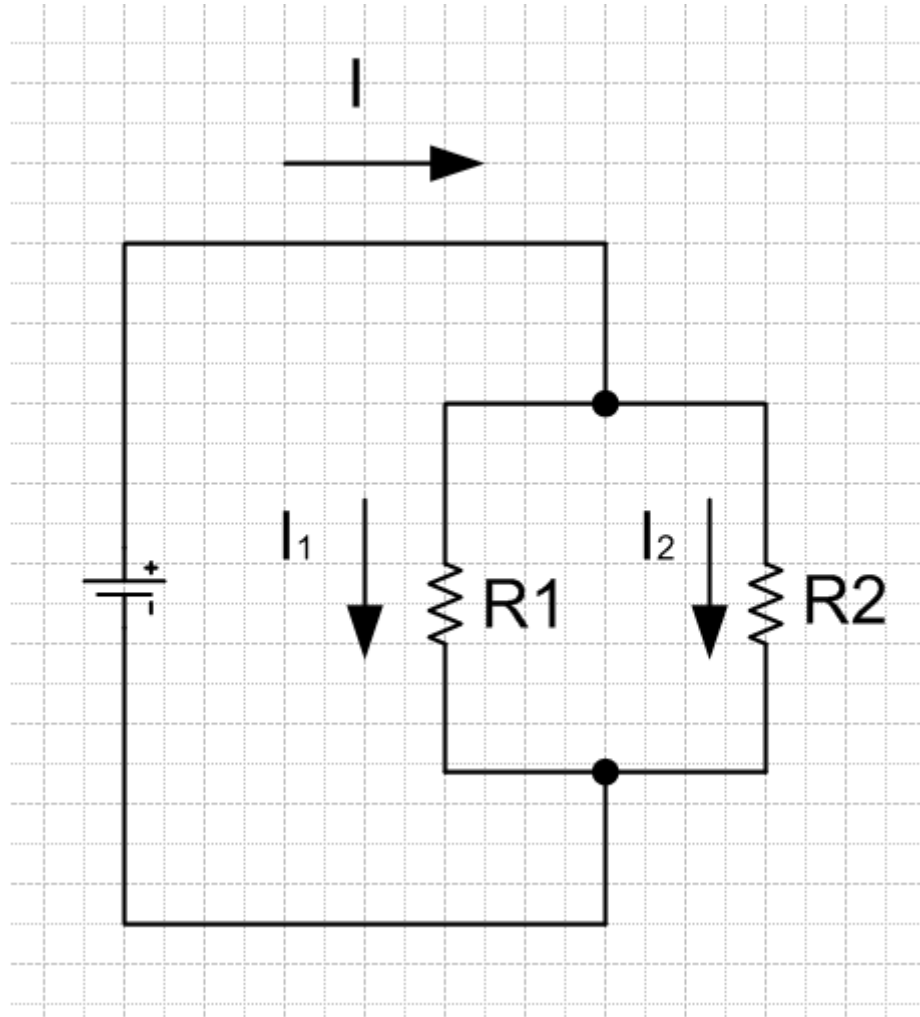
$I = 30\ A$,

$R_1 = 4\ \Omega$,

$R_2 = 6\ \Omega$.

According to the first Kirchhoff rule:

$$I = I_1 + I_2.$$

According to the second Kirchhoff rule:

$$I_1 R_1 - I_2\ R_2 = 0.$$

Solve this system of equations:

$$(I - I_2\ )R_1 - I_2\ R_2 = 0,$$

$$IR_1 = I_2\ (R_1 + R_2),$$

$$I_2 = \frac{IR_1}{R_1 + R_2} = \frac{30 \cdot 4}{4 + 6} = 12\ A,$$

$$I_1 = I - I_2 = 30 - 12 = 18\ A.$$

Answer: The current of first resistor is 18 A, the current of second resistor is 12 A.