

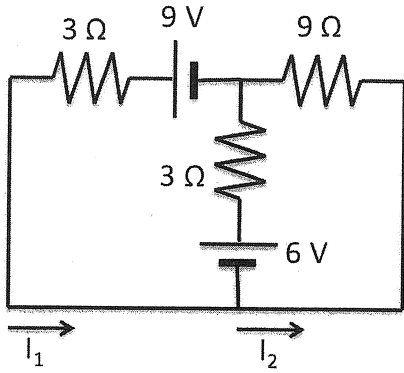
Quiz #2:

SOLUTION

Name:

PID:

Question: Calculate I_1 and I_2 in this circuit.



$$\text{LEFT LOOP: } 6 - 3(I_1 - I_2) + 9 - 3I_1 = 0$$

$$-6I_1 + 3I_2 + 15 = 0$$

$$6I_1 - 3I_2 = 15 \quad \dots \quad \text{EQUATION (1)}$$

$$\text{RIGHT LOOP: } -9I_2 + 3(I_1 - I_2) - 6 = 0$$

$$3I_1 - 12I_2 = 6 \quad \dots \quad \text{EQUATION (2)}$$

$$(1) - 2 \times (2)$$

$$6I_1 - 3I_2 = 15$$

$$- 2) \quad 6I_1 - 24I_2 = 12$$

$$21I_2 = 3$$

$$I_2 = \frac{1}{7} \text{ A}$$

SUBSTITUTE IN (1)

$$6I_1 - \frac{3}{7} = 15$$

$$6I_1 = \frac{105}{7} + \frac{3}{7} = \frac{108}{7}$$

$$I_1 = \frac{108}{7 \cdot 6} = \frac{18}{7} \text{ A}$$

$$I_1 = \frac{18}{7} \text{ A}$$