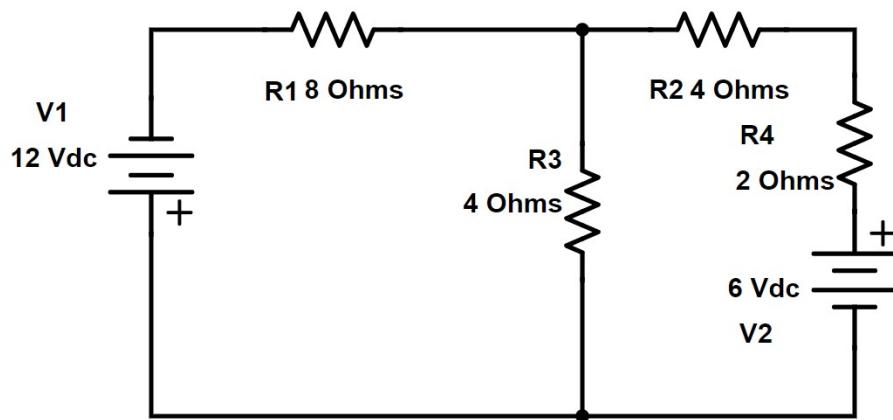
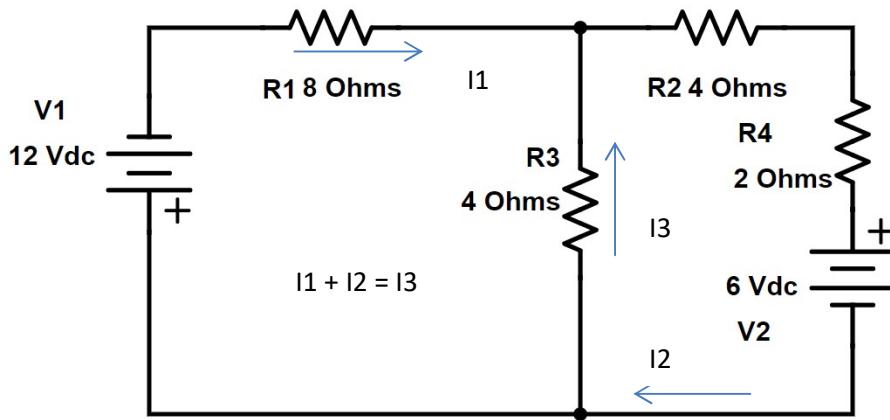


1 .Find all the Current and Voltage on the Circuit Below



Solution

1 .Find all the Current and Voltage on the Circuit Below



$$1. \quad I_3 = I_1 + I_2$$

- $V_1 - VR_1 - VR_3 = 0$
- $V_2 - VR_3 - VR_2 - VR_4 = 0$
- $V_1 - R_1(I_1) - R_3(I_1 + I_2) = 0$
 $V_2 - R_3(I_1 + I_2) - R_2(I_2) - R_4(I_2) = 0$
- $12 \text{ Vdc} - 8 I_1 - 4(I_1 + I_2) = 0$
- $6 \text{ Vdc} - 4(I_1 + I_2) - 4(I_2) - 2(I_2) = 0$
- $12 \text{ Vdc} - 8(I_1) - 4(I_1) - 4(I_2) = 0$
- $6 \text{ Vdc} - 4(I_1 + I_2) - 4(I_2) - 2(I_2) = 0$
- $12 \text{ Vdc} - 12(I_1) - 4(I_2) = 0$
- $6 \text{ Vdc} - 4(I_1) - 8(I_2) = 0$
- $-12(I_1) - 4(I_2) = -12 \text{ Vdc}$
- $-4(I_1) - 8(I_2) = -6 \text{ Vdc}$

- $24(I_1) + 8(I_2) = 24 \text{ Vdc}$ ← (Multiply by -2)
- $-4(I_1) - 8(I_2) = -6 \text{ Vdc}$

- $20(I_1) = 18 \text{ Vdc}$ ← Add the Above Equations
- $I_1 = 18/20 = 0.9 \text{ A}$ ← Solve for I_1
- $24(0.9) + 8(I_2) = 24 \text{ Vdc}$
 $21.6 + 8(I_2) = 24 \text{ Vdc}$
 $8(I_2) = 24 - 21.6$
 $8(I_2) = 2.4 \text{ Vdc}$
 $I_2 = 2.4/8$
 $I_2 = 0.3 \text{ A}$
- $VR_1 = I_1 \times R_1 ; 8 \times 0.9 = 7.2 \text{ Vdc}$
- $VR_2 = I_2 \times R_2 ; 0.3 \times 4 = 1.2 \text{ Vdc}$
- $VR_3 = I_3 \times R_3 ; (I_1 + I_2) \times R_3 ; 1.2 \text{ A} \times 4 = 4.8 \text{ Vdc}$
- $VR_4 = I_2 \times R_4 ; 0.3 \times 2 = 0.6 \text{ Vdc}$