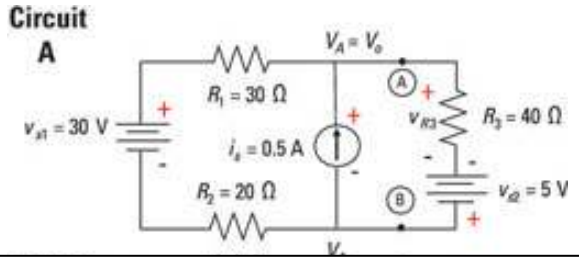
Find voltage across R_3=40Ω using superposition theorem.



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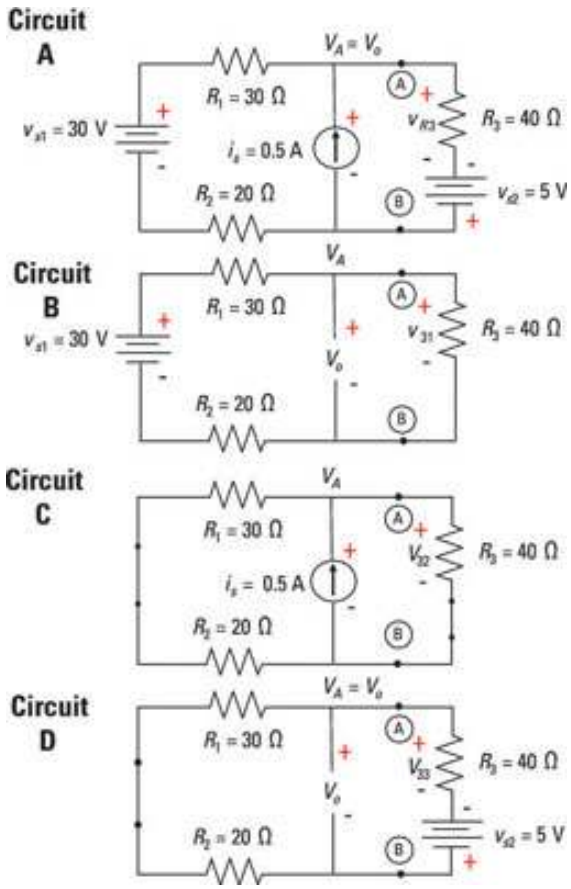

B: Using voltage divider rule

$$v_{31} = (30\text{ V})\left(\frac{40\ \Omega}{30\ \Omega + 20\ \Omega + 40\ \Omega}\right) = 13.33\text{ V}$$

C: Using current divider rule

$$i_{32} = (0.50\text{ A})\left(\frac{50\ \Omega}{50\ \Omega + 40\ \Omega}\right) = 0.2778\text{ A}$$

$$v_{32} = (0.278\text{ A})(40\ \Omega) = 11.11\text{ V}$$

D: Using voltage divider rule

$$v_{33} = (5\text{ V})\left(\frac{40\ \Omega}{30\ \Omega + 20\ \Omega + 40\ \Omega}\right) = 2.222\text{ V}$$

Using superposition principle

$$v_{R3} = v_{31} + v_{32} + v_{33}$$

$$v_{R3} = 13.33\text{ V} + 11.11\text{ V} + 2.222\text{ V}$$

$$v_{R3} = 26.67\text{ V}$$