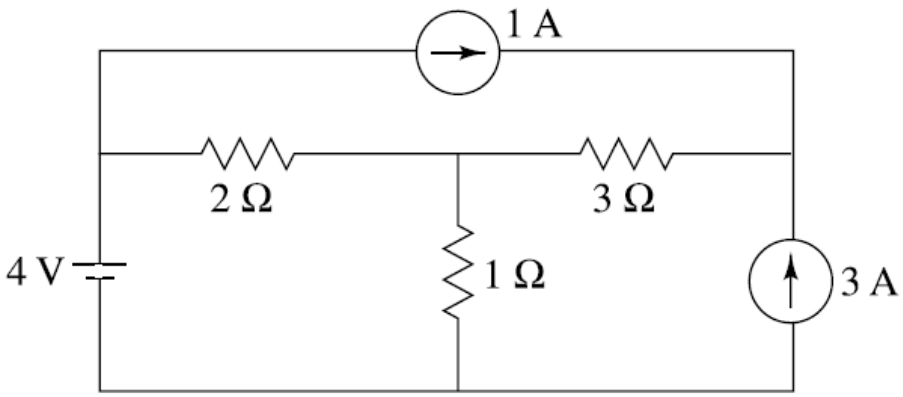
Lecture 12

1. **Find the current through the 1Ω resistor.**



Solution:

Step I: *When the 4-V source is acting alone*

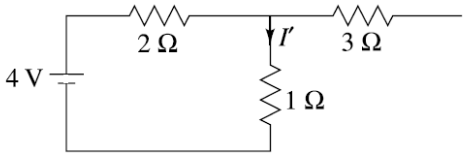


Fig. 3.20

$$I' = \frac{4}{2+1} = 1.33 \text{ A } (\downarrow)$$

Step II: *When the 3-A source is acting alone*

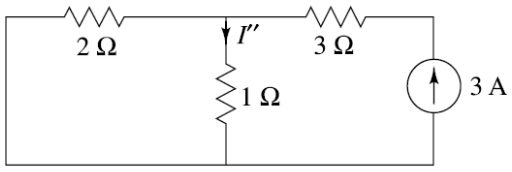


Fig. 3.21

By current-division formula,

$$I'' = 3 \times \frac{2}{1+2} = 2 \text{ A } (\downarrow)$$

Step III: *When the 1-A source is acting alone*

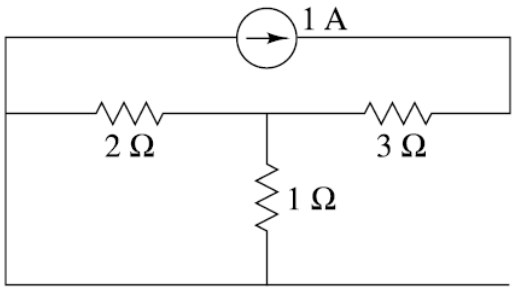


Fig. 3.22

The circuit can be redrawn as shown:

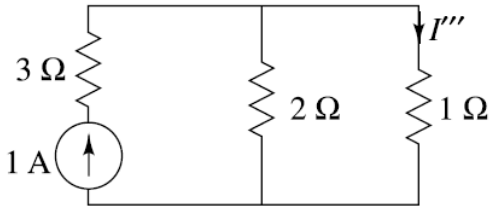


Fig. 3.23

By current-division formula,

$$I''' = 1 \times \frac{2}{2+1} = 0.66 \text{ A } (\downarrow)$$

Step IV: *By superposition theorem,*

$$I = I' + I'' + I'''$$
$$= 1.33 + 2 + 0.66 = 4 \text{ A } (\downarrow)$$