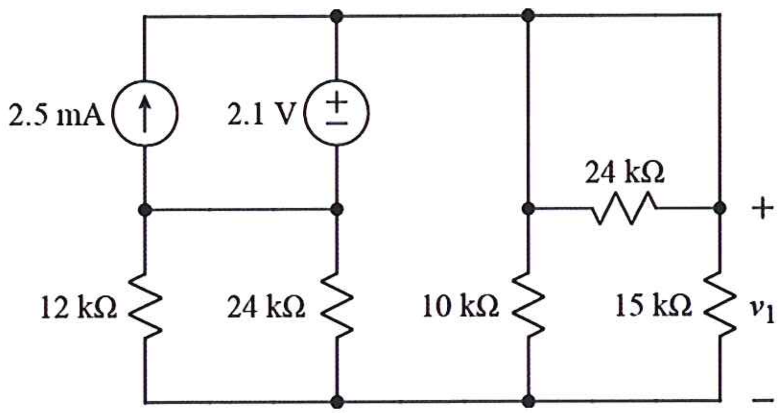
Ex:



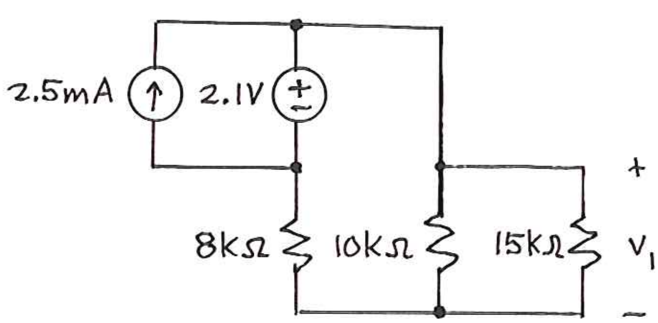
Calculate v_1.

sol'n: The lower left 12kΩ and 24kΩ R's are in parallel. The upper right wire and 24 kΩ are in parallel, as well.

$$12\,k\Omega \,||\, 24\,k\Omega = 12\,k\Omega \cdot 1||2 = 12\,k\Omega \cdot \frac{2}{3} = 8\,k\Omega$$

$$0\,\Omega \,||\, 24\,k\Omega = 0\,\Omega \quad \text{(wire)}$$

circuit:

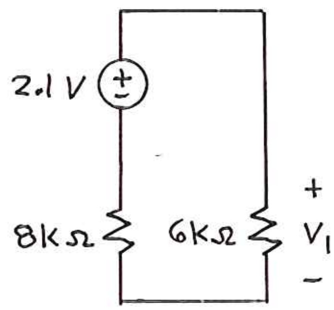


We see that the 10kΩ is in parallel with the 15kΩ.

$$10\,k\Omega \,||\, 15\,k\Omega = 5\,k\Omega \cdot 2||3 = 5\,k\Omega \cdot \frac{6}{5} = 6\,k\Omega$$

We have two separate circuits across the 2.1V source: one circuit is the 2.5 mA source, and the other circuit is all the R's. We may solve these circuits separately, meaning we may ignore the 2.1V source.

circuit for finding V_1:



This is a V-divider:

$$V_1 = 2.1V \cdot \frac{6k\Omega}{6k\Omega + 8k\Omega} = 2.1V \cdot \frac{6}{14} = 2.1V\left(\frac{3}{7}\right)$$

or

$$V_1 = 0.9V$$