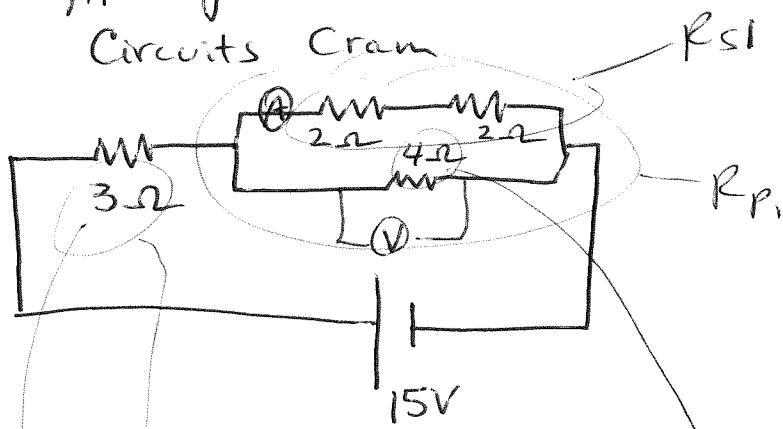


AP Physics

Circuits Cram



1. What is equivalent resistance?

$$R_{parallel} = 2\Omega + 2\Omega = 4\Omega$$

$$R_{parallel} = \frac{1}{\frac{1}{4\Omega} + \frac{1}{4\Omega}} = \frac{1}{\frac{2}{4}} = 2\Omega$$

$$R_{total} = 3\Omega + 2\Omega = 5\Omega$$

2. What is max current total?

$$\frac{15V}{5\Omega} = I_{total} = 3 \text{ Amps}$$

(So 3 Amps goes through
The 3Ω Resistor and 3 Amps
is split in the Parallel set)

3. What is voltage @ the voltmeter (V) above?

The parallel branch has an equivalent resistance of 2Ω
The lone resistor in series w/ the parallel branch = 3Ω

$$\begin{cases} \frac{2\Omega}{2\Omega+3\Omega} = \frac{2\Omega}{5\Omega} \\ \frac{2\Omega}{5\Omega} \times 15V = \frac{30}{5} = 6 \text{ Volts} \end{cases}$$

$$\begin{cases} \frac{3\Omega}{2\Omega+3\Omega} = \frac{3\Omega}{5\Omega} \times 15V = \frac{45}{5} = 9 \text{ Volts} \\ V_{parallel} = I_p R_p \\ V_p = (3A)(2\Omega) \\ V_p = 6 \text{ Volts} \end{cases}$$

$\textcircled{1}$	$V_{parallel} = I_p R_p$
	$V_p = (3A)(2\Omega)$
	$V_p = 6 \text{ Volts}$
	$V_{3\Omega} = I_{3\Omega} R_{3\Omega}$
	$V_{3\Omega} = (3A)(3\Omega)$

4. What's the current in the (A) meter above?

- Voltage in parallel branch = 6 Volts

$$- 2\Omega + 2\Omega = 4\Omega$$

$$- V = IR \text{ so } 6V = I(4\Omega) \quad I = 1.5 \text{ Amps}$$

- Notice: The other resistor (4Ω) also has $I = 1.5 \text{ Amps}$

- Notice: Max current = 3 Amps