Mo Dividers

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1

Firstly we know that i_1 will always be 2A because of the current source.
Next we can solve for i_2 by finding the equivalent resistance of the three resistors in parrallel, then calculating the current divider. $6\Omega \parallel 12\Omega = 4\Omega$ and $4\Omega \parallel 4\Omega = 2\Omega$. Therefore the current divider means that $i_2 = 2\text{A}*(2\Omega/12\Omega) = 1/3\text{A}$

Since we have no voltage source and know that the resistance across v is 20Ω, we have to calculate v using V = I×R: V = (-2A)*(20Ω) = -40V

2

We already know that i_1 has to be 2A because of the current source. However for calculating v and i_2 we can now use the voltage source and resistor divider logic and ignore the current source. From earlier, the equivalent resistance of the three resistors is 2Ω which means the total resistance across the section is $2\Omega + 20\Omega = 22\Omega$. This means the current through the equivalent resistor is $90\text{V}/22\Omega$. Based on the current divider principle, i_2 should then be $(90/22)\text{A}*(2\Omega/12\Omega)=(15/22)\text{A}$.
v can then be calculated by the resistor devider equation of $90\text{V}*(20\Omega/22\Omega) = (900/11)\text{V}$