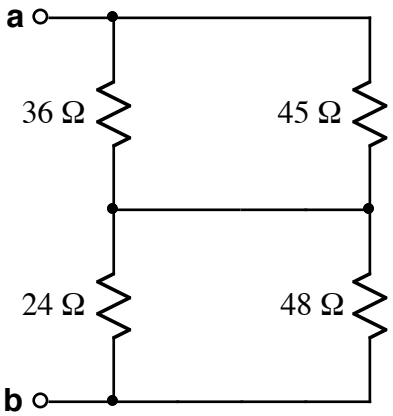
HOMEWORK #3 solution

EX:



Find the value of total resistance between terminals **a** and **b**.

SOL'N: The 36 Ω and 45 Ω resistors are in parallel, as are the 24 Ω and 48 Ω resistors:

$$36\ \Omega \parallel 45\ \Omega = 9\ \Omega \cdot 4 \parallel 5 = 9\ \Omega \cdot \frac{4 \cdot 5}{4+5} = 9\ \Omega \cdot \frac{20}{9} = 20\ \Omega$$

$$24\ \Omega \parallel 48\ \Omega = 24\ \Omega \cdot 1 \parallel 2 = 24\ \Omega \cdot \frac{1 \cdot 2}{1+2} = 24\ \Omega \cdot \frac{2}{3} = 16\ \Omega$$

We replace the 36 Ω and 45 Ω resistors with a single 20 Ω resistor, and we replace the 24 Ω and 48 Ω resistors with a single 16 Ω resistor. This leaves two resistors in series, whose values sum:

$$R_{\mathbf{ab}} = 20\ \Omega + 16\ \Omega = 36\ \Omega$$