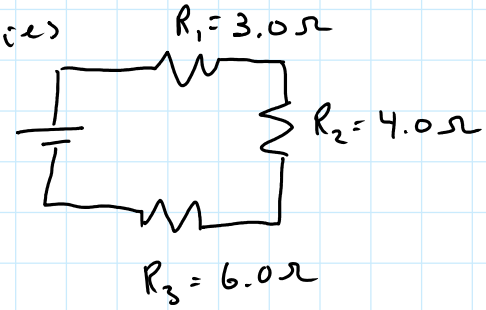
Resistance in a Series and Parallel Circuit

Wednesday, May 17, 2017 10:37 AM

Series

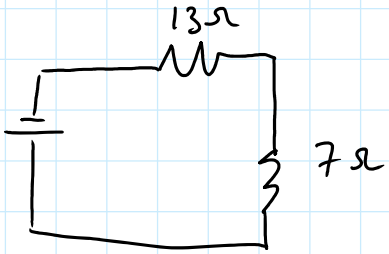


The 3 resistors can be replaced with one equivalent resistor

$$R_{eq} = R_1 + R_2 + R_3 + \cdots$$ for series

$= 3\Omega + 4\Omega + 6\Omega$

$= 13\Omega$



$R_{eq} = 20\,\Omega$

a) $10\,\Omega$

Parallel

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \cdots$$

$$= \frac{1}{3} + \frac{1}{4} + \frac{1}{6}$$

$$= \frac{4}{12} + \frac{3}{12} + \frac{2}{12}$$

$$\frac{1}{R_{eq}} = \frac{9}{12}$$

$$R_{eq} = \frac{12}{9} = 1.\overline{3}\,\Omega$$

X^{-1} $\frac{1}{x}$

$.333 + .25 + .167 = .75$

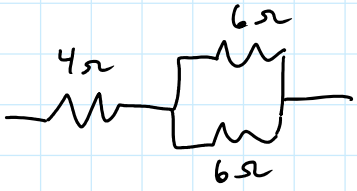
$\frac{1}{R_{eq}} = .75$

$.75^{-1} = 1.33$

b) $\frac{1}{R_{eq}} = \frac{1}{1} + \frac{1}{4}$ $\frac{1}{R_{eq}} = 1.25$, $R_{eq} = 0.8\,\Omega$

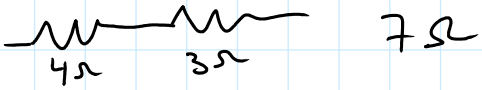
c) $\frac{1}{R_{eq}} = \frac{1}{8} + \frac{1}{8}$ $R_{eq} = 4\,\Omega$

d) combo

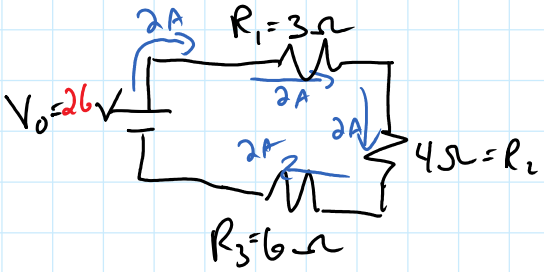


e) $0.69\,\Omega$

f) $2.73\,\Omega$



Determine the V, I, R is the following circuit $I = \frac{V}{R}$



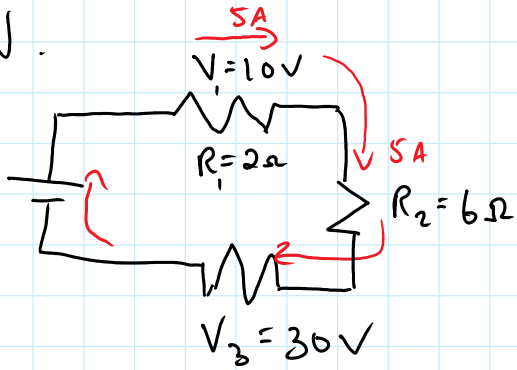
$V_0 = 26V$ $I_0 = 2A$ $R_{eq} = 13\Omega$

$V_1 = 6V$ $I_1 = 2A$ $R_1 = 3\Omega$

$V_2 = 8V$ $I_2 = 2A$ $R_2 = 4\Omega$

$V_3 = 12V$ $I_3 = 2A$ $R_3 = 6\Omega$

H.W.



$V_0 = 70V$ $I_0 = 5A$ $R_{eq} = 14\Omega$

$V_1 = 10V$ $I_1 = 5A$ $R_1 = 2\Omega$

$V_2 = 30V$ $I_2 = 5A$ $R_2 = 6\Omega$

$V_3 = 30V$ $I_3 = 5A$ $R_3 = 6\Omega$

$R_{eq} = R_1 + R_2 + R_3$

$V = IR$, $I = \frac{V}{R}$, $R = \frac{V}{I}$