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HW #3 ENGR 065-2

2.- a) Compute equivalent resistance seen by the independent current source

"2R", "2" in parallel

$$2R \parallel 2R = \frac{2R \cdot 2R}{2R+2R} = \frac{4R^2}{4R} = R$$

Now $R+R = 2R$

and $2R \parallel 2R = \frac{R \cdot 2R}{R+2R} = \frac{2R^2}{3R} = \boxed{\frac{2}{3}R = Req}$

b) The equivalent resistance of the following circuit is $R_{eq} = 50\,\Omega$. Find R

$R_{eq} = 50\,\Omega$ $\quad \frac{1}{R_1} = \frac{1}{4} \Rightarrow 4\,\Omega = R_1$ $\quad R_2 = 10 + R + 4$, $R_2 = (14+R)\,\Omega$

$$\frac{1}{R_1} = \frac{1}{12} + \frac{1}{12} + \frac{1}{12} = 3/12 = 1/4$$

$$Req = 30 + (60 \parallel 14+R)$$

$$50 = 30 + (60 \parallel 14+R)$$

$$20 = \frac{60(14+R)}{16(14+R)}$$

$$\frac{1}{3} = \frac{14+R}{74+R} \Rightarrow 74+R = 3(14+R) \Rightarrow 74+R = 42+3R$$

$$32 = 24$$

$\boxed{R = 16\,\Omega}$