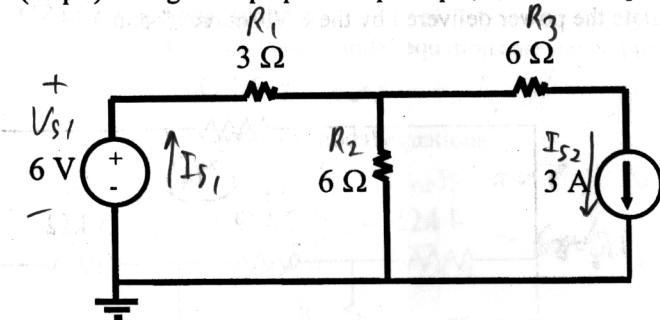


6. (12 pts) Using the superposition principle, solve for the power supplied by the voltage source.

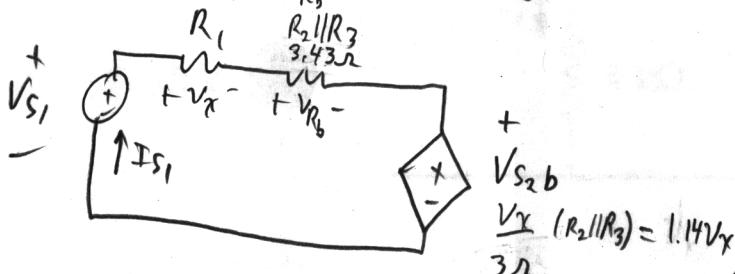
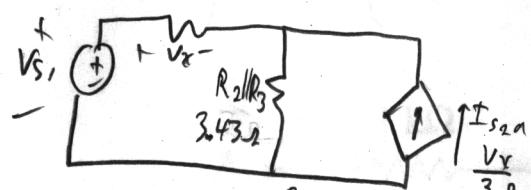
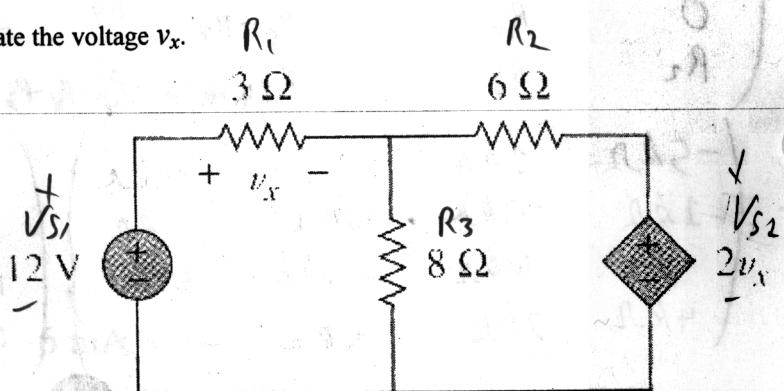
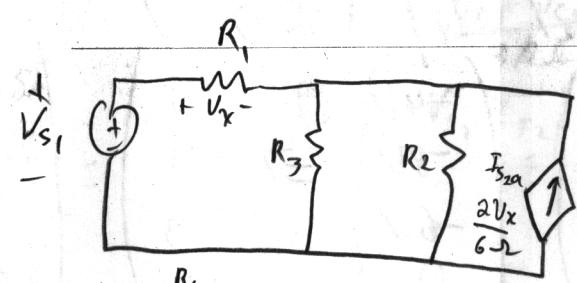


$$P_{S1} = 16 \text{ W}$$

$$\begin{aligned} I_{S1} &= \frac{V_{S1}}{R_1 + R_2} + \frac{R_1 || R_2}{R_1} I_{S2} \\ &\approx 66.7 \text{ mA} + \frac{2}{3} 3 \text{ A} \\ &= 2.667 \text{ A} \end{aligned}$$

$$P_{S1} = V_{S1} I_{S1}$$

7. (12 pts) Use source transformations to calculate the voltage  $v_x$ .



$$I_{S1} = -\frac{V_{S2a} + V_{S1}}{R_1 + R_2}$$

$$\frac{V_x}{R_1} = -\frac{1.14 V_x + V_{S1}}{R_1 + R_2}$$

$$v_x \left( \frac{1}{R_1} + \frac{1.14}{R_1 R_2} \right) = +\frac{V_{S1}}{R_1 R_2}$$

$$\begin{aligned} v_x &= +\frac{V_{S1}}{R_1 R_2} \\ &\quad \left( \frac{1}{R_1} + \frac{1.14}{R_1 R_2} \right) \\ &= +3.65 \text{ V} \end{aligned}$$