

$$P_{6V} = ?$$

$$\text{Mesh a: } 4v_a + 3(v_a - v_b) - 6 = 0$$

$$\text{Mesh } b: 6v_b + 30(v_b - v_a) + 10v_b + 20(v_b + 8)$$

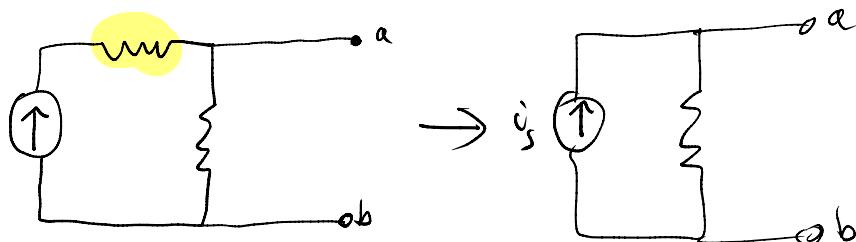
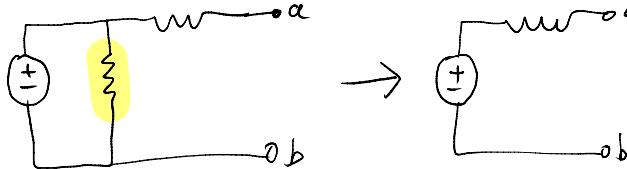
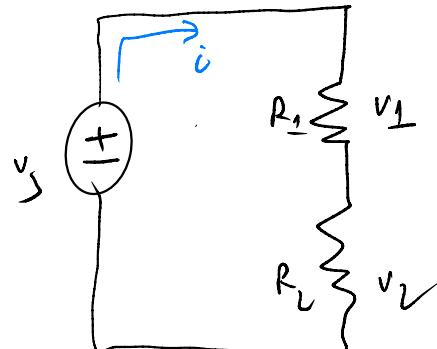
$$(1) \quad \begin{cases} 34v_a - 30v_b = 6 \\ -30v_a + 66v_b = -160 \end{cases} \Rightarrow \begin{cases} v_a = -3.2768 \text{ A} \\ v_b = -3.91369 \text{ A} \end{cases}$$

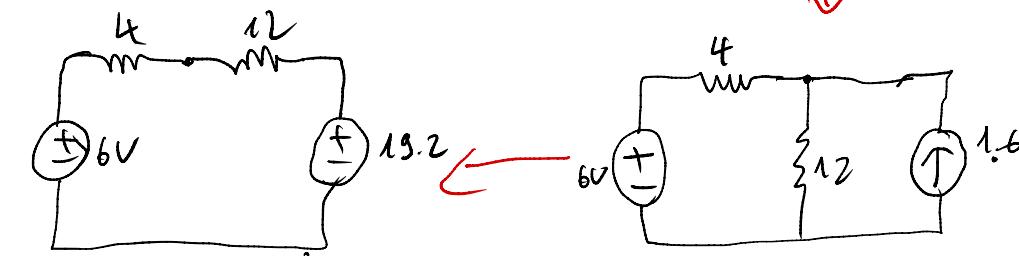
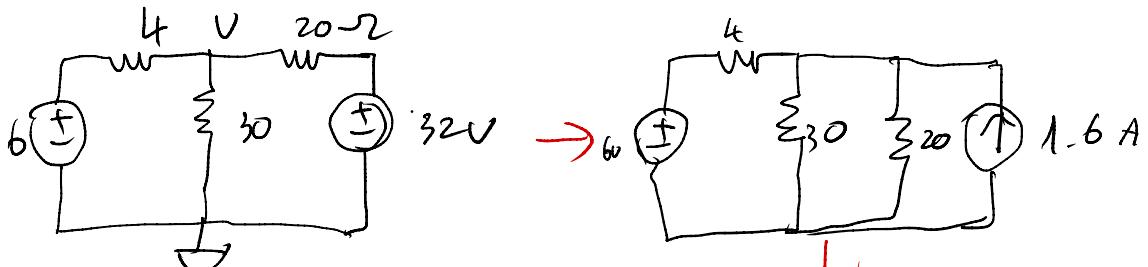
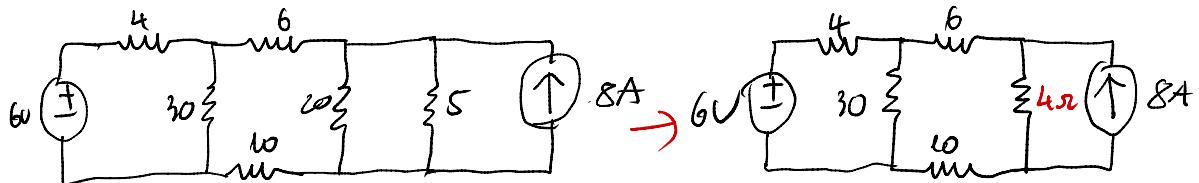
$$P_{6V} = -g \cdot \dot{C} = (-6)(-3.2768) = 19.66 \text{ W}$$

The Voltage divider circuit :

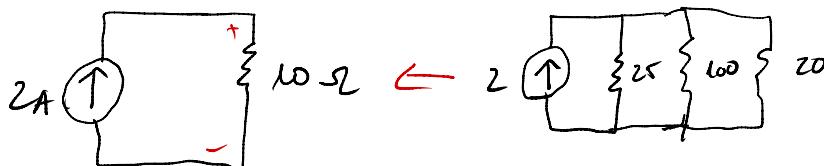
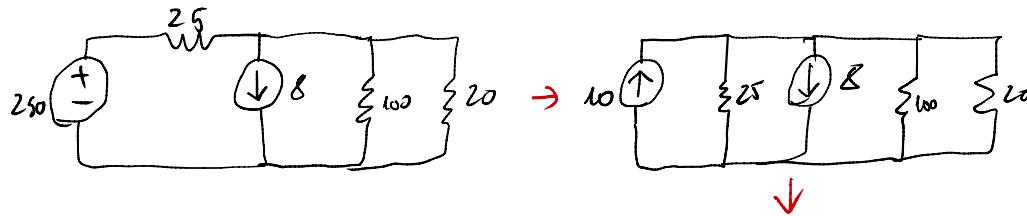
$$V_1 = V_S \frac{R_1}{R_1 + R_2}$$

$$V_2 = V_S \frac{R_2}{R_1 + R_2}$$

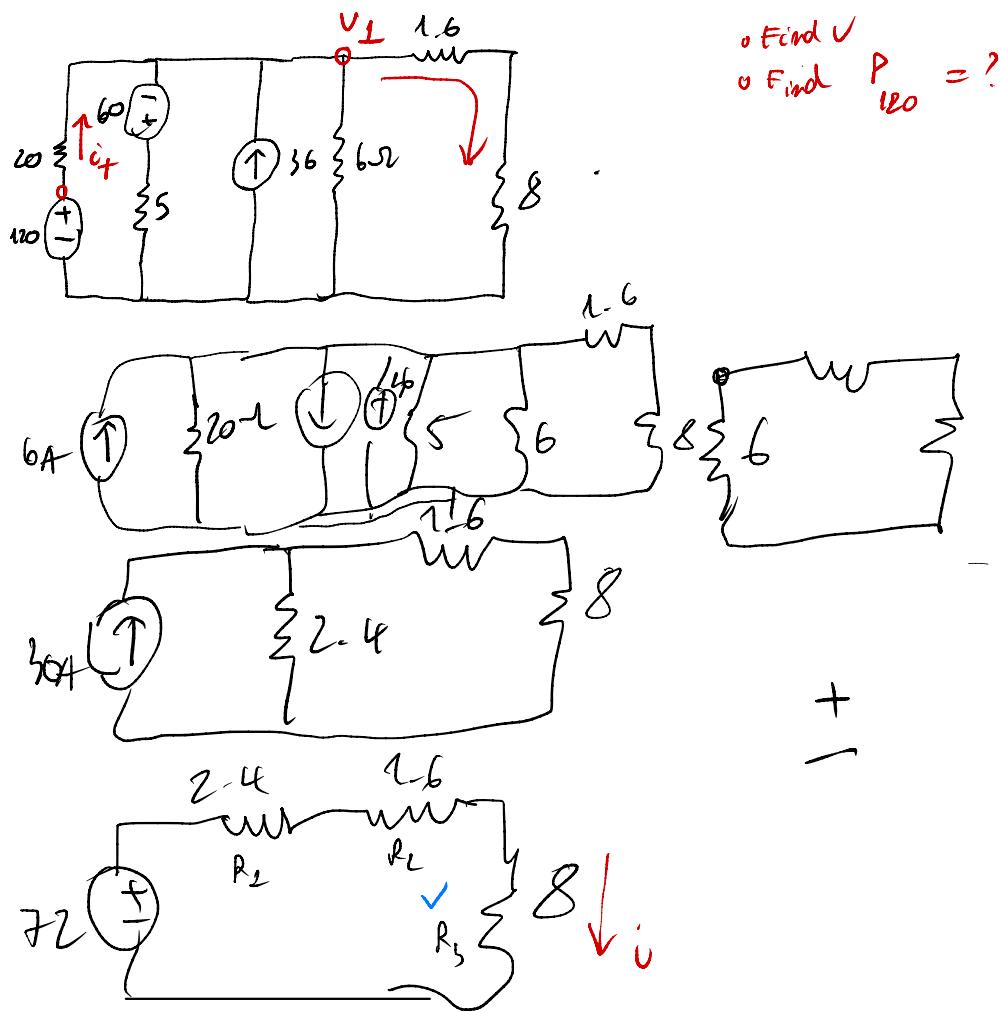




$$j_{6V} = \frac{6-19.2}{1.6} = -0.825A$$



$$\frac{1}{R} = \frac{1}{25} + \frac{1}{100} + \frac{1}{20} \Rightarrow R = 10$$

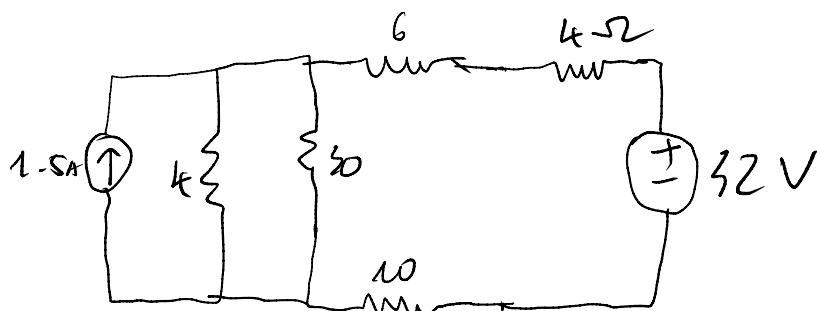
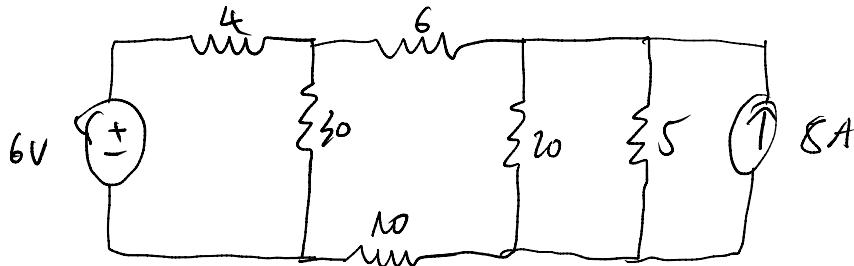


$$V = 72 \times \frac{8}{2.4 + 1.6 + 8} = 48 \text{ V}$$

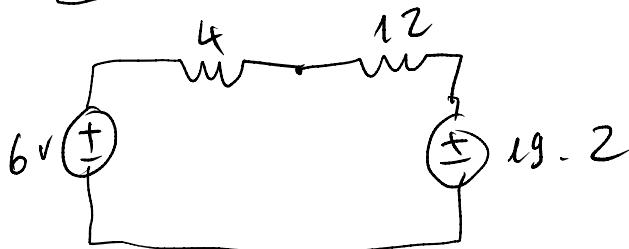
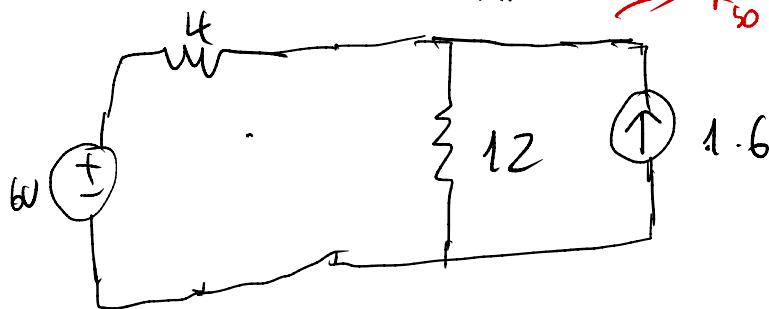
$$b) i_8 = \frac{48}{8} = 6 \text{ A} \rightarrow V_1 = (8 + 1.6)6 = 57.6 \text{ V}$$

$$i_f = \frac{120 - 57.6}{20} = 3.12 \text{ A}$$

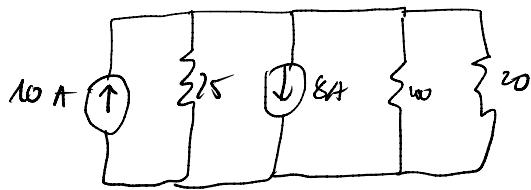
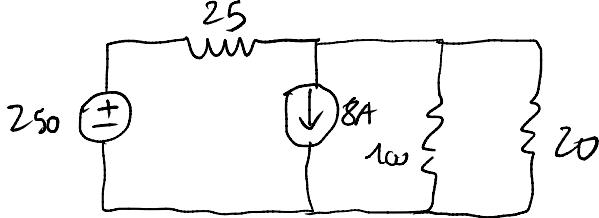
$$P_{120} = -V_1 i = -120 \times 3.12 = -374.4 \text{ W}$$

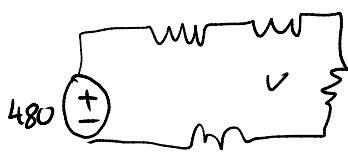
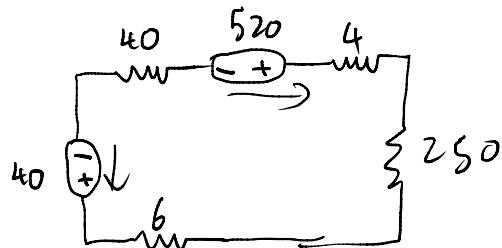
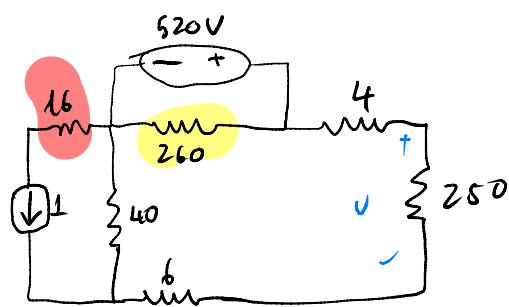


$$\rightarrow R_{30} \parallel (10 + 6 + 4)$$



$$i_{uv} = \frac{6 - 19.2}{4 + 12} = -0.825A$$





$$V = 480 \frac{250}{300} = 400V$$