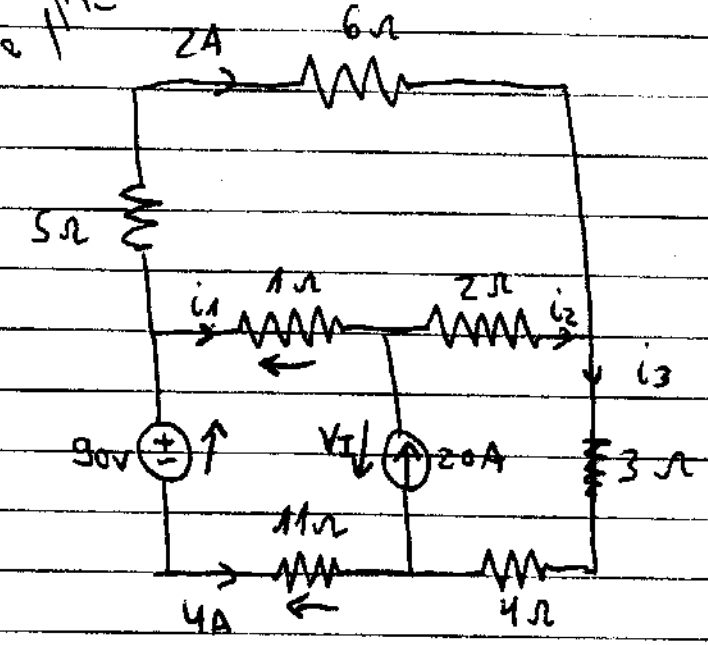


$i_1 + 2A + 4A = 0 \Rightarrow i_1 = -6A$

$20 + i_1 = i_2 = 20 - 6 = 14A$

$i_3 = i_2 + 2A = 14 + 2 = 16A$ //

$P_{1\Omega} = i_1^2 \cdot 1 = 36 \cdot 1 = 36\ W$

$P_{2\Omega} = i_2^2 \cdot 2 = 14^2 \cdot 2 = 392\ W$

$P_{3\Omega} = i_3^2 \cdot 3 = 768\ W$

$P_{4\Omega} = i_3^2 \cdot 4 = 1024\ W$

$P_{11\Omega} = 4^2 \cdot 11 = 176\ W$

$P_{5\Omega} = 2^2 \cdot 5 = 20\ W$

$P_{6\Omega} = 2^2 \cdot 6 = 24\ W$

$P_{90V} = V \cdot I = 90 \cdot 4 = 360\ W$

KVL: $90V + V_I + 4 \cdot 11 = i_1 \cdot 1 = -6$

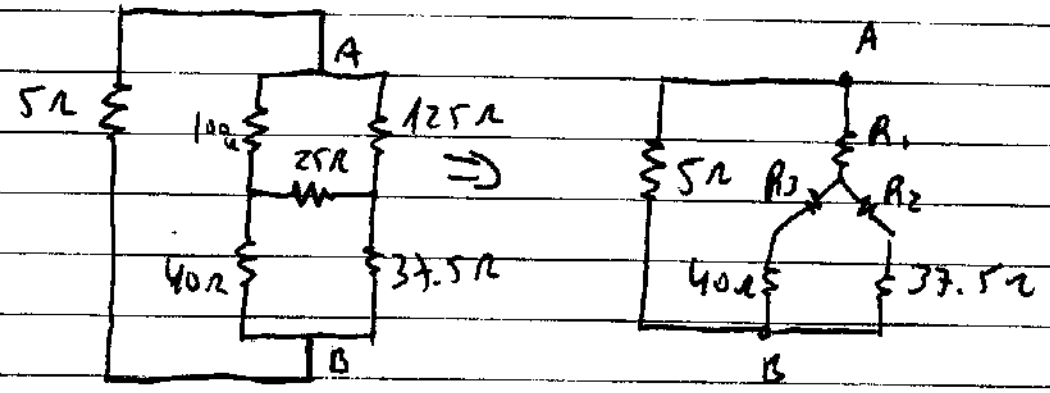
$V_I = -140$

$P_I = -140 \cdot 20 = i \cdot V = 2800$

$P_I + P_{1\Omega} + P_{2\Omega} + P_{3\Omega} + P_{4\Omega} + P_{11\Omega} + P_{5\Omega} + P_{6\Omega} + P_{90V} = 0$ //

(2)

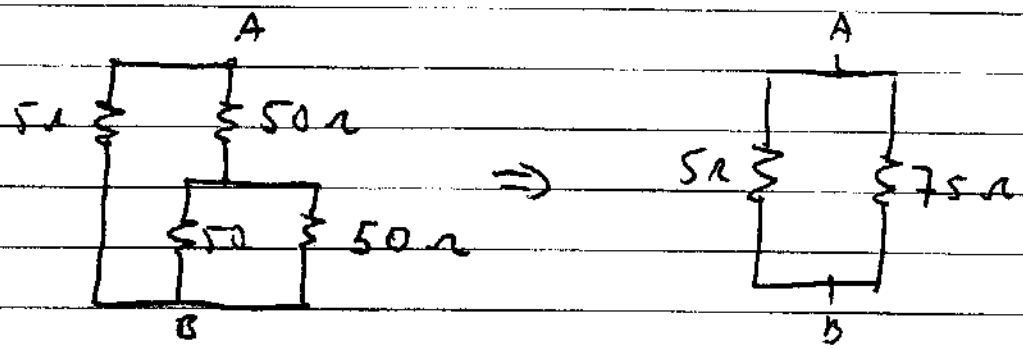
(c)



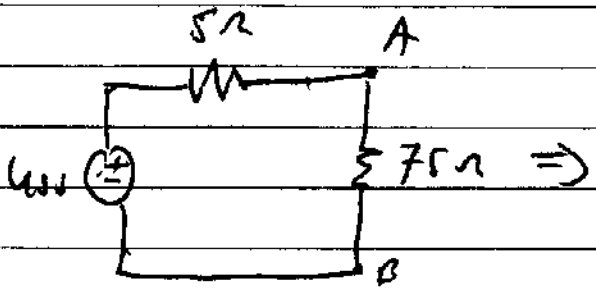
$$R_1 = \frac{100 \times 125}{250} = 50\,\Omega$$

$$R_2 = \frac{125 \times 25}{250} = 12.5\,\Omega$$

$$R_3 = \frac{100 \times 25}{250} = 10\,\Omega$$



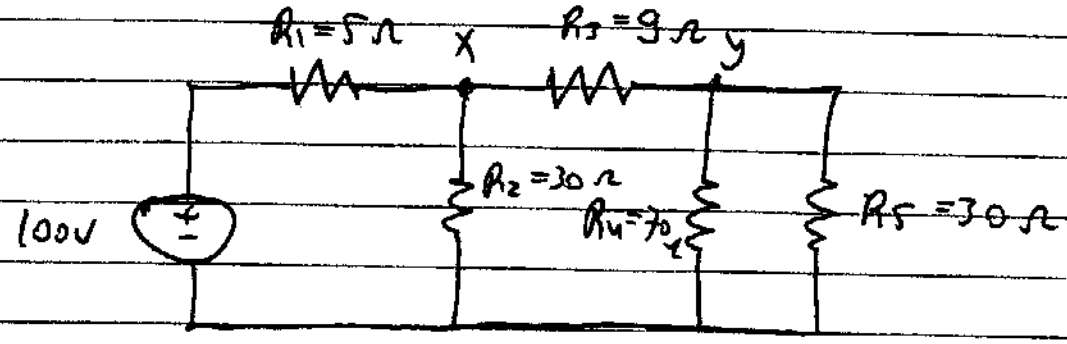
$$R_{AB} = 5 \| 75 = \frac{5 \cdot 75}{80} = 4.6875\,\Omega$$



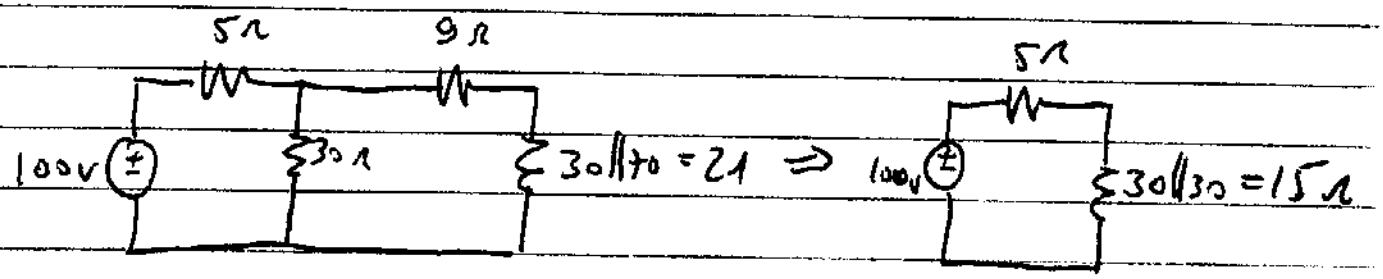
(2)

$$I = \frac{40}{80} = \frac{1}{2}\,A$$

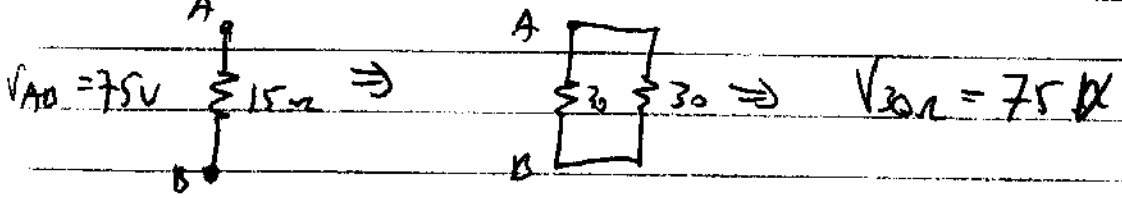
$$40 \cdot I = 40 \cdot \frac{1}{2} = 20\,w = P$$

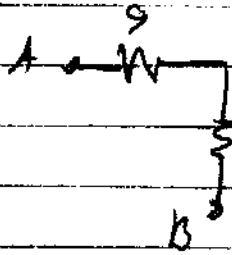


③
④



$$V_{15\Omega} = \frac{100 \cdot 15}{15+5} = 75V$$



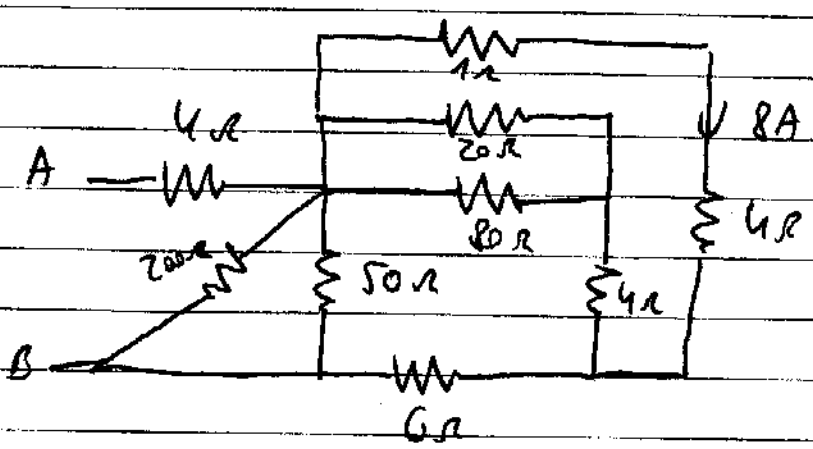


$\Rightarrow V_{21} = \frac{75 \cdot 21}{30} = 52.5V$

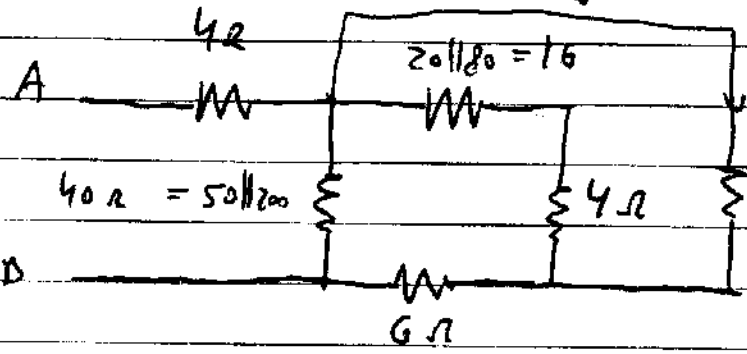
$$V_{21} = V_{70\Omega} = V_{30\Omega} = 52.5V \Rightarrow P_{R5} = \frac{(52.5)^2}{30} = 91.875W$$

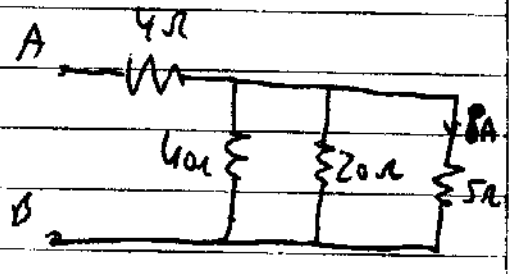
$$V_{xy} = V_{R3} = \frac{75 \cdot 9}{30} = 22.5V$$ ②

$$P_{xy} = P_{R3} = \frac{V_{R3}^2}{R_3} = \frac{(22.5)^2}{9} = 56.25W$$ ⑤



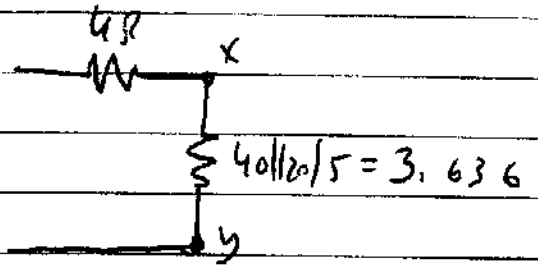
④





$R_{AB} = 4 + 40||20||5 =$
$4 + 40||4 = 7.363\Omega$

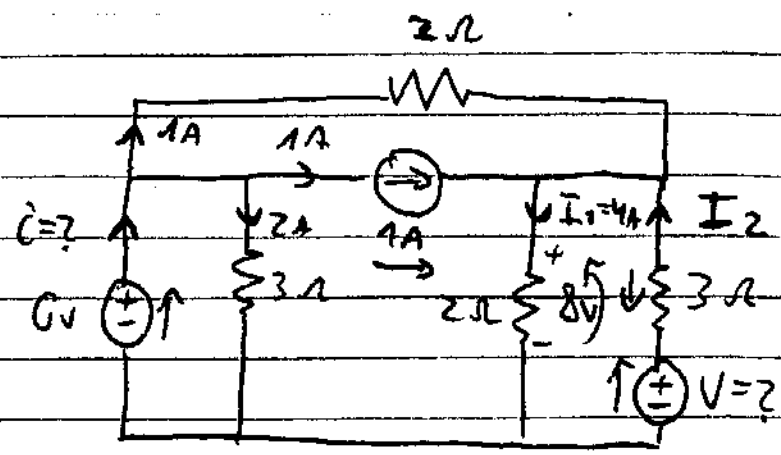
$V_{xy} = V_{5\Omega} = V_{20\Omega} = V_{40\Omega} = 8 \cdot 5 = 40V$ ③



$I = \frac{V_{xy}}{3.636} = 11A \Rightarrow V_{4\Omega} + V_{xy} = V_{AB} = 11 \cdot 4 + 40 =$

$84V$ //

(5)



kV2: $6 + V_{1A} = 8 \Rightarrow V_{1A} = 2V = V_{2\Omega}$

$\frac{V_{2\Omega}}{2} = I_{2\Omega} = \frac{2}{2} = 1A$

$\frac{V_{3\Omega}}{3\Omega} = I_{3\Omega} = \frac{6}{3} = 2A$

$i = 1 + 2 + 1 = 4A$ //

$\frac{V_{2\Omega}}{2\Omega} = I = \frac{8}{2} = 4A$

$I_2 + 1 + 1 = 4A \Rightarrow I_2 = 2A$

$V_{3\Omega} = 3 \cdot 2 = 6V$

$V - 6 = 8V \Rightarrow V = 14V$

$V \cdot I = P = -14 \cdot 2 = -28W$

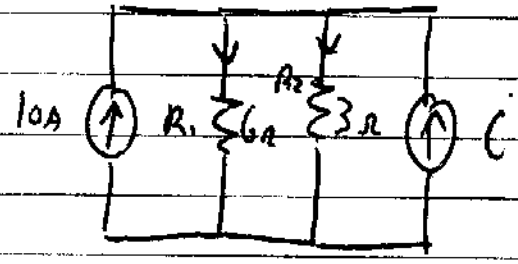
$P_{6V} = -6 \cdot 4 = -24W$

$P_{1A} = 1 \cdot -2 = -2W$

⑥

$P_{R_1} = 24W$

$P_{R_1} \cdot R_1 = V^2 = 24 \cdot 6 \Rightarrow V = 12V$



$\frac{12}{3} + \frac{12}{6} = i + 10 \Rightarrow 4 + 2 = i + 10 \Rightarrow i = -4A$ //