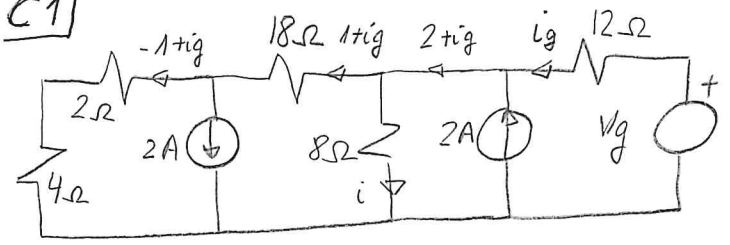
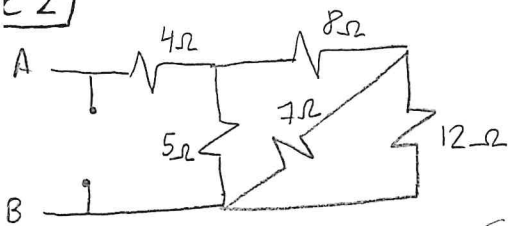
C1



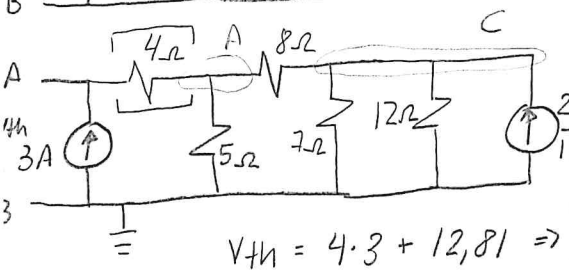
$6(-1+i_g)+18(1+i_g)=8\cdot 1 \Rightarrow i_g=-1/6\ A$

$V_g=12i_g+8 \Rightarrow \boxed{V_g=6V}$

C2



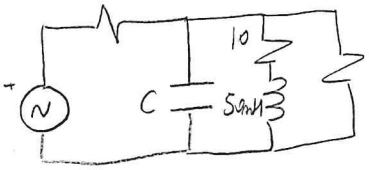
$R_{th}=4+5\,//\,(8+7\,//\,12) \Rightarrow \boxed{R_{th}=7,56\Omega}$



$$\begin{pmatrix} 1/5+1/8 & -1/8 \\ -1/8 & 1/8+1/7+1/12 \end{pmatrix}\begin{pmatrix} V_A \\ V_C \end{pmatrix}=\begin{pmatrix} 3 \\ 20/12 \end{pmatrix} \Rightarrow \begin{pmatrix} V_A \\ V_C \end{pmatrix}=\begin{pmatrix} 12,81 \\ 9,305 \end{pmatrix}$$

$V_{th}=4\cdot 3+12,81 \Rightarrow \boxed{V_{th}=24,81\ V}$

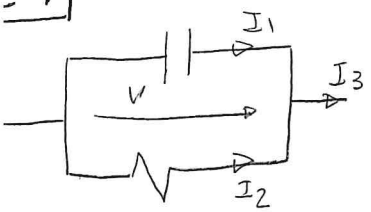
C3 $\omega=100\ rad/s$

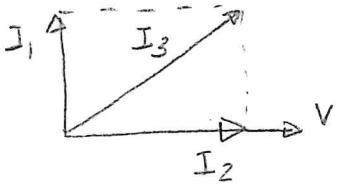


$$Y=\frac{1}{10+100\cdot 50\cdot 10^{-3}j}=0,08-0,04j$$

$Y_C=\omega C j=0,04j \Rightarrow \boxed{C=400\mu F}$

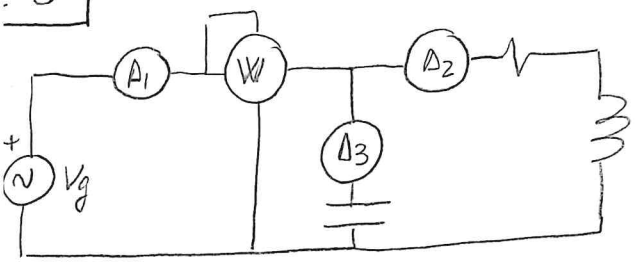
C4





$\boxed{|I_3|=\sqrt{|I_1|^2+|I_2|^2}=\sqrt{5^2+5^2}=7,07A}$

C5



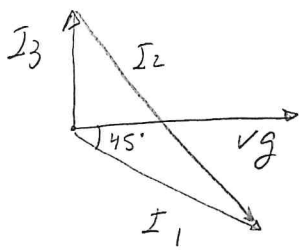
$v_g(t)=200\cos(200t+10°)$

$W=\frac{200}{\sqrt{2}}\cdot 10\cdot\cos(V_g, I_1) \Rightarrow V_g, I_1=\pm 45°$

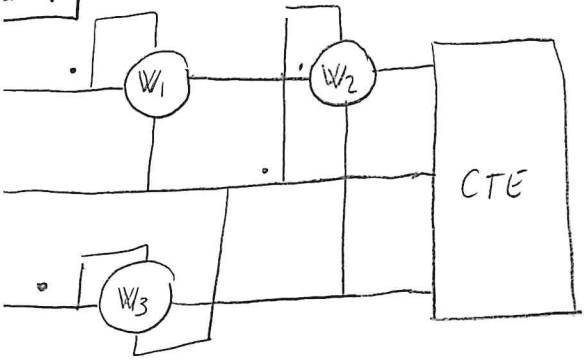
como gera reactiva, I_1 retrasa a V_g 45°

$20^2=10^2+|I_3|^2-2\cdot 10\cdot|I_3|\cdot\cos 135° \Rightarrow$

$\Rightarrow \boxed{|I_3|=11,63A}$



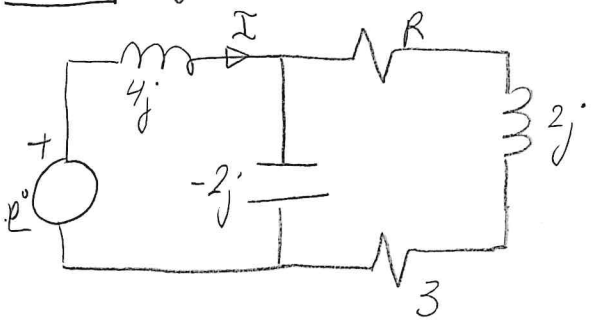
C9



$$\left.\begin{aligned} Q&=\sqrt{3}\cdot W_2 \\ Q&=\sqrt{3}\,(W_3-W_1) \end{aligned}\right\} W_2=W_3-W_1 \Rightarrow$$

$\Rightarrow W_3=W_1+W_2 \Rightarrow \boxed{W_3=1500W}$

C6 $v_g(t) = 50\cos(1000t - 15°)$



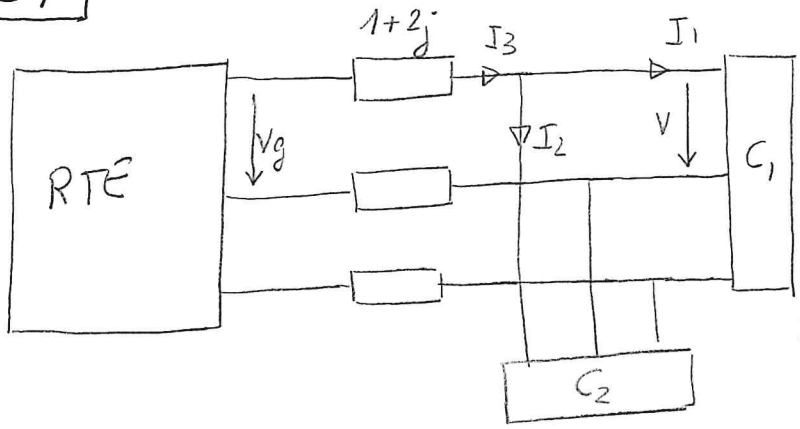
$$Z_{th} = (4j)\,//\,(-2j) + 3 + 2j = 3 - 2j$$

$$R^{max} = |Z_{th}| = 3{,}6\,\Omega$$

$$I = \frac{50/\sqrt{2}}{4j + (6{,}6+2j)\,//\,(-2j)} = 4{,}9063 - 16{,}19j = 16{,}917\,\angle -73{,}14°$$

$$Q_g = \frac{50}{\sqrt{2}} \cdot 16{,}917 \cdot \operatorname{sen}(0 + 73{,}14) \Rightarrow \boxed{Q_g = 572{,}39\ \text{VAr}}$$

C7

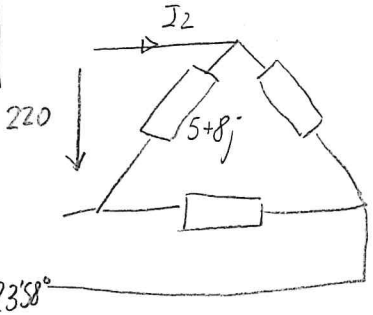


$P_1 = 8000\,W \quad Q_1 = 6000\,\text{VAr (cap)}$

$|V| = 220\,V \quad \phi_1 = \arctg\frac{Q_1}{P_1} = -36{,}86°$

$$P_1 = \sqrt{3}\cdot|V|\cdot|I_1|\cdot\cos\phi_1 \Rightarrow \boxed{|I_1| = 26{,}24\,A}$$

$$I_1 = 26{,}24\,\angle 36{,}86°$$



$$|I_2| = \sqrt{3}\cdot\frac{220}{\sqrt{5^2+8^2}} \Rightarrow$$

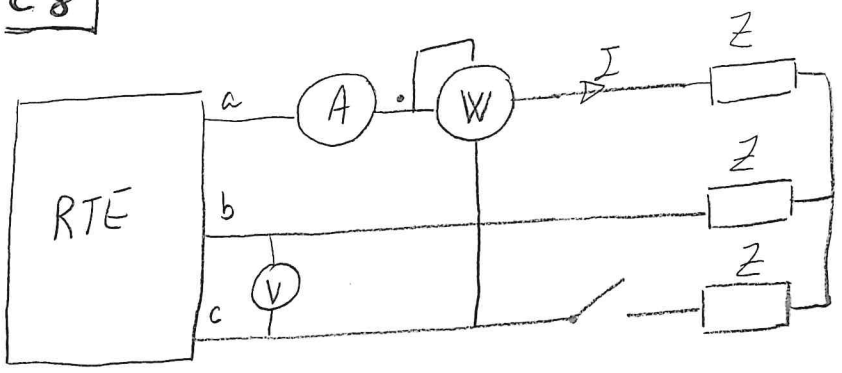
$$\Rightarrow \boxed{|I_2| = 40{,}39\,A}$$

$$I_2 = 40{,}39\,\angle -58°$$

$$I_3 = I_1 + I_2 = 26{,}24\,\angle 36{,}86° + 40{,}39\,\angle -58° = 46{,}26\,\angle -23{,}58°$$

$$\boxed{|I_3| = 46{,}26\,A} \qquad V_g^F = (1+2j)\,46{,}26\,\angle -23{,}58° + \frac{220}{\sqrt{3}} = 216{,}806\,\angle 17{,}8° \qquad \boxed{|V_g| = 375{,}5\,V}$$

C8

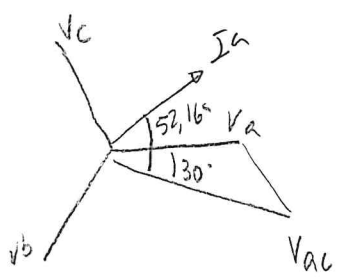


$$|Z| = \frac{V/\sqrt{3}}{A} = 3{,}464\,\Omega$$

$$W = |V_{ac}|\cdot|I_a|\cdot\cos(\hat{V_{ac}, I_a}) \Rightarrow$$

$$\Rightarrow \hat{V_{ac}, I_a} = \pm 52{,}169$$

$$\phi_Z = 52{,}169 - 30 = 22{,}16°\ \text{(cap)}$$



Cuando el interruptor se abre

$$I = \frac{V_{ab}}{2Z} = \frac{150\,\angle 30°}{2\cdot 3{,}464\,\angle 22{,}16°} = 21{,}65\,\angle 52{,}169°. \qquad \boxed{A = 21{,}65\,A}$$

$$W = |V_{ac}|\cdot|I|\cdot\cos(\hat{V_{ac}, I}) = 150\cdot 21{,}65\cdot\cos(-30° - 52{,}169°) \Rightarrow$$

$$\Rightarrow \boxed{W = 442{,}47\,W}$$