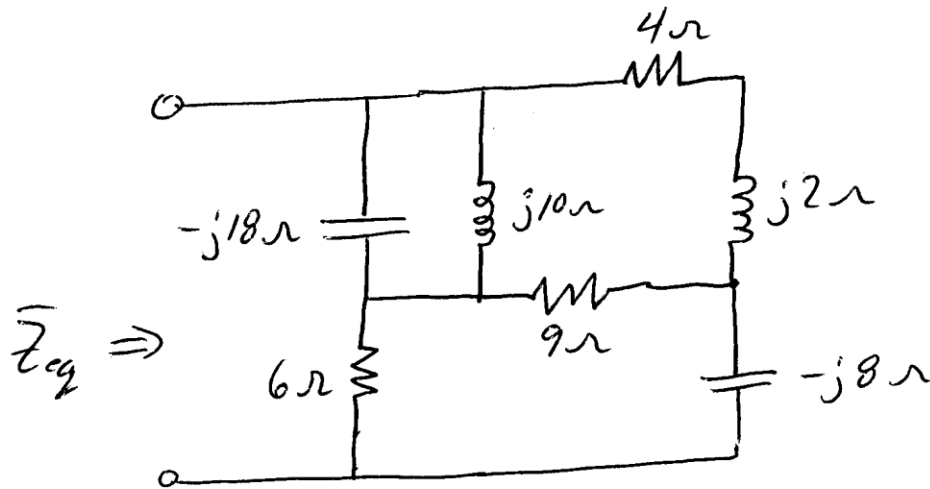
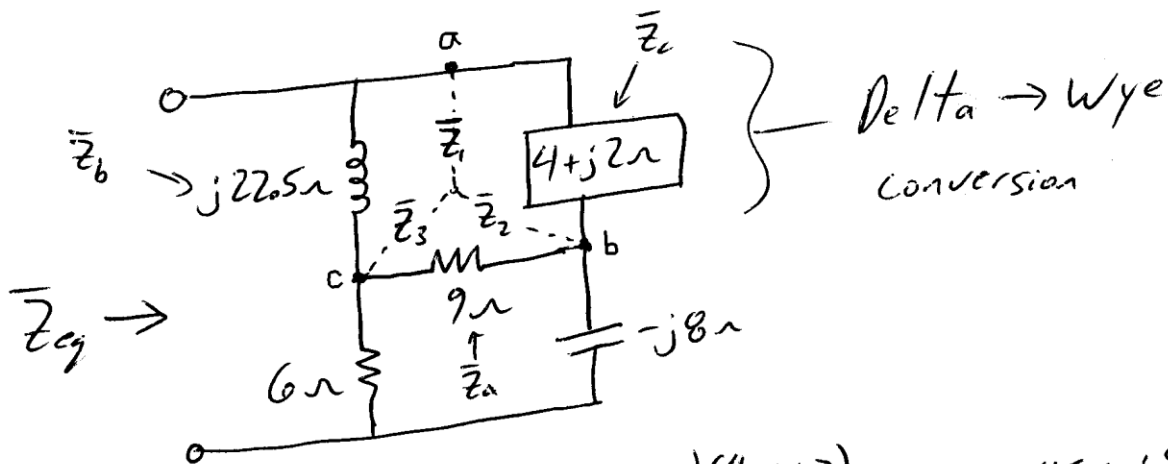


ex. Wye-Delta Conversions: Find \bar{Z}_{eq} for circuit shown.



* Combine $4\Omega + j2\Omega$ series $\rightarrow 4 + j2\Omega$

* Combine $-j18\Omega + j10\Omega$ parallel $\rightarrow \left[\frac{1}{-j18} + \frac{1}{j10} \right]^{-1} = j22.5\Omega$

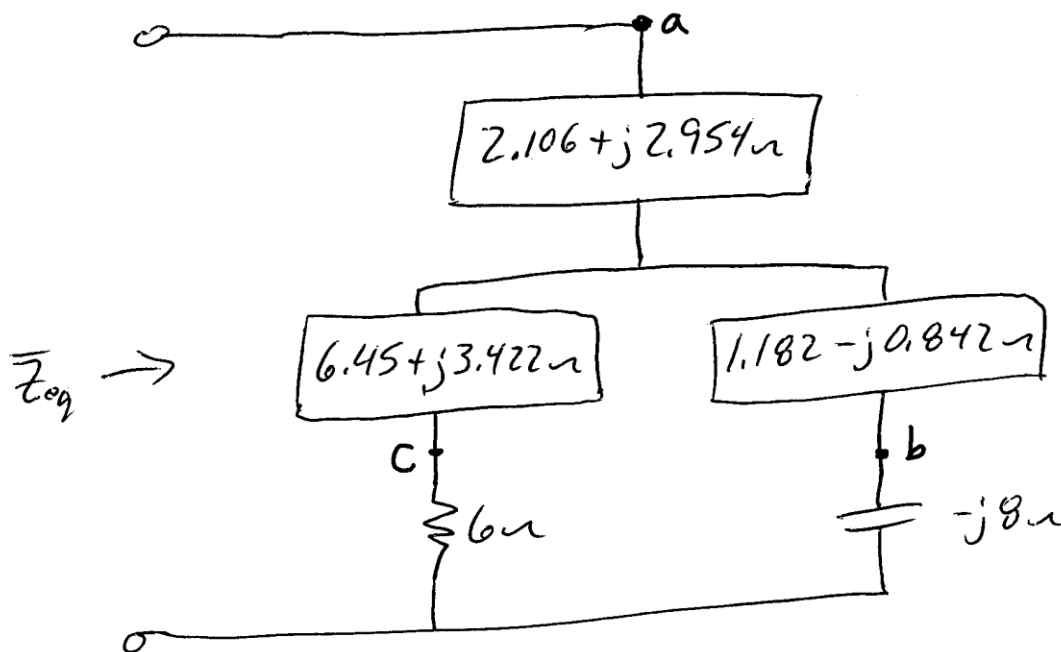


$$\bar{Z}_1 = \frac{\bar{Z}_b \bar{Z}_c}{\bar{Z}_a + \bar{Z}_b + \bar{Z}_c} = \frac{(j22.5)(4 + j2)}{9 + j22.5 + (4 + j2)} = \frac{-45 + j90}{13 + j24.5}$$

$$= \underline{2.106 + j2.954\Omega}$$

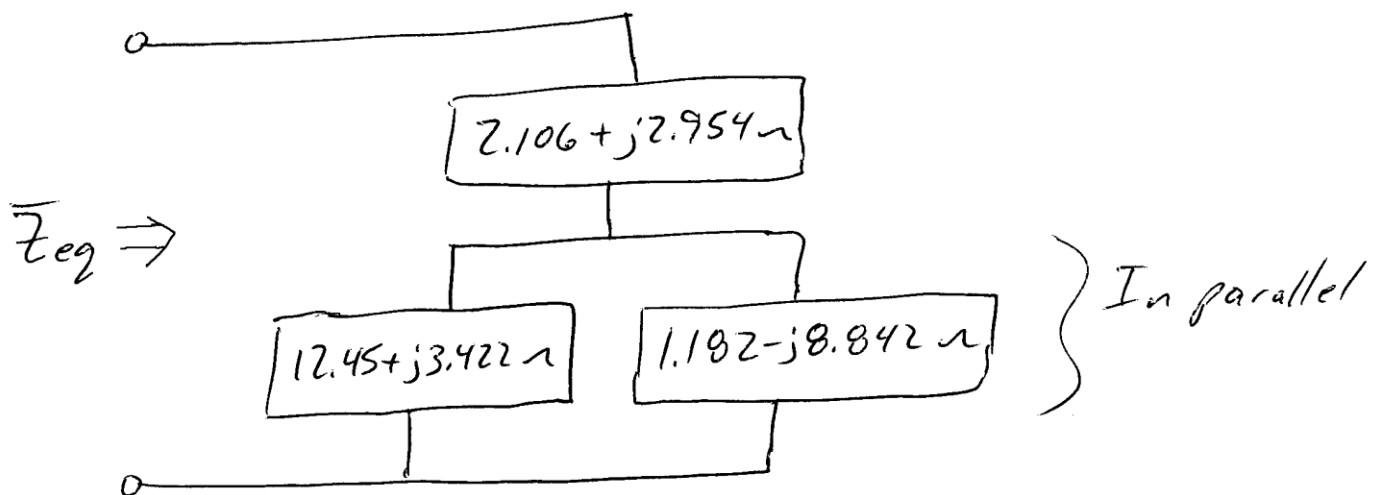
$$\bar{Z}_2 = \frac{\bar{Z}_a \bar{Z}_c}{\bar{Z}_a + \bar{Z}_b + \bar{Z}_c} = \frac{9(4 + j2)}{13 + j24.5} = \underline{1.182 - j0.842\Omega}$$

$$\bar{Z}_3 = \frac{\bar{Z}_a \bar{Z}_b}{\bar{Z}_a + \bar{Z}_b + \bar{Z}_c} = \frac{9(j22.5)}{13 + j24.5} = \underline{6.45 + j3.422\Omega}$$

ex. cont.

* Series combination $6 + (6.45 + j3.422) = 12.45 + j3.422 \Omega$

* Series combination $(1.182 - j0.842) - j8 = 1.182 - j8.842 \Omega$



$$\bar{Z}_{eq} = (2.106 + j2.954) + (12.45 + j3.422) \parallel (1.182 - j8.842)$$

$$\bar{Z}_{eq} = \underline{\underline{7.625 - j2.63 \Omega}}$$