

LINE FLOW CALCULATIONS.

Once the bus voltages and angles are found, a load flow program will then usually determine the flow in each line. For a line or transformer connected from bus  $k$  to bus  $j$  having impedance

$$\bar{Z}_{\pi kj}$$

and shunt admittances,

$$\bar{Y}_{\pi jk}, \bar{Y}_{\pi kj}$$

at each end, then

$$\bar{I}_{kj} = \bar{Y}_{\pi kj} \bar{V}_k + \frac{\bar{V}_k - \bar{V}_j}{\bar{Z}_{\pi kj}}$$

$$\bar{I}_{jk} = \bar{Y}_{\pi jk} \bar{V}_j + \frac{\bar{V}_j - \bar{V}_k}{\bar{Z}_{\pi jk}}$$

So that

$$\bar{S}_{kj} = \bar{V}_k \left[ \bar{Y}_{\pi kj} \bar{V}_k + \frac{\bar{V}_k - \bar{V}_j}{\bar{Z}_{\pi kj}} \right]^*$$

$$\bar{S}_{jk} = \bar{V}_j \left[ \bar{Y}_{\pi jk} \bar{V}_j + \frac{\bar{V}_j - \bar{V}_k}{\bar{Z}_{\pi jk}} \right]^*$$

and hence the line loss

$$\bar{S}_{\text{loss}} = \bar{S}_{kj} + \bar{S}_{jk}$$

# 3 Ø TRANSFORMERS

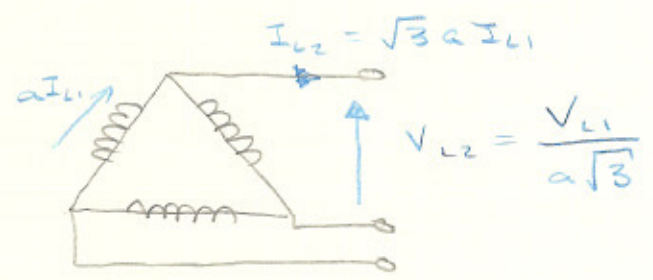
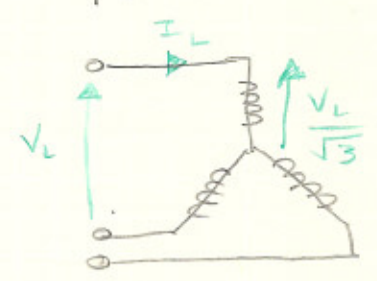
## 1 Ø TRANSFORMER



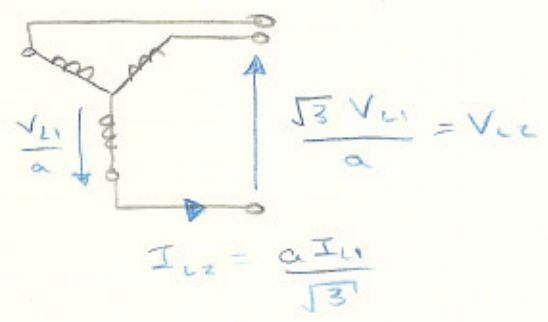
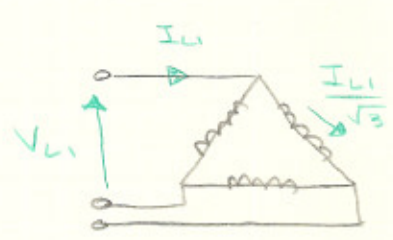
transformer ratio  $= a = \frac{N_1}{N_2}$

## 3 Ø TRANSFORMER

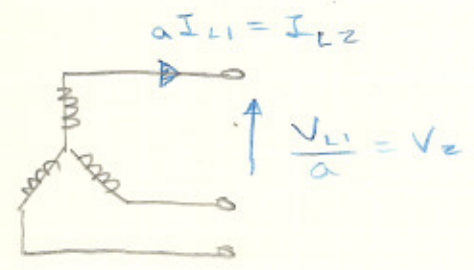
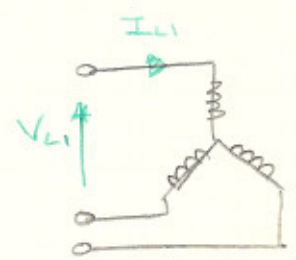
### STAR/DELTA.



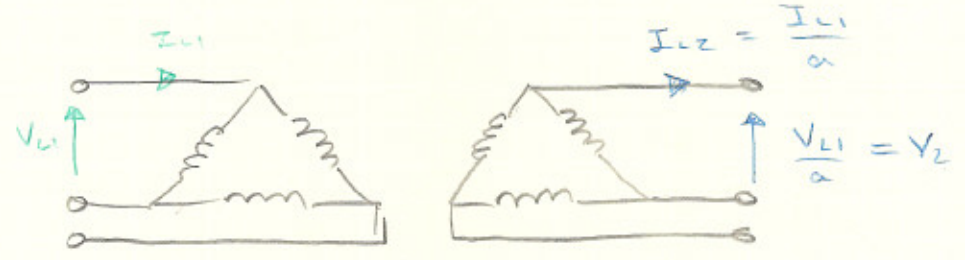
### DELTA/STAR



### STAR/STAR



# DELTA / DELTA



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