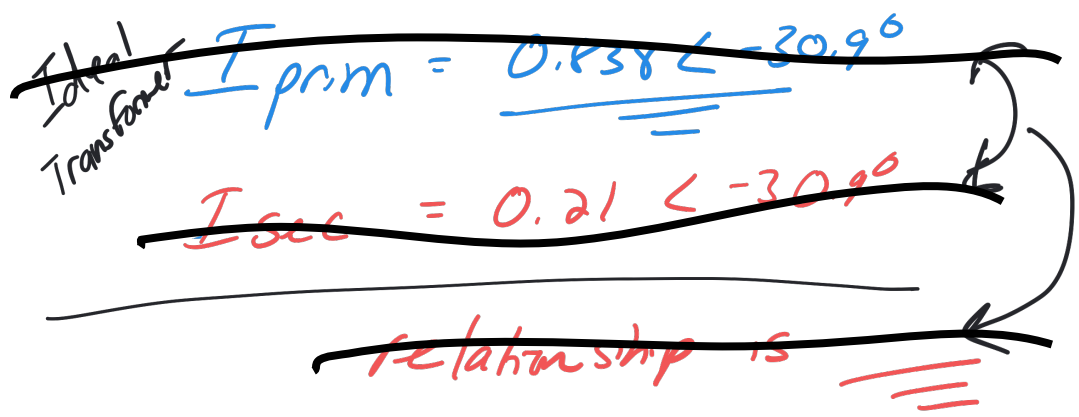
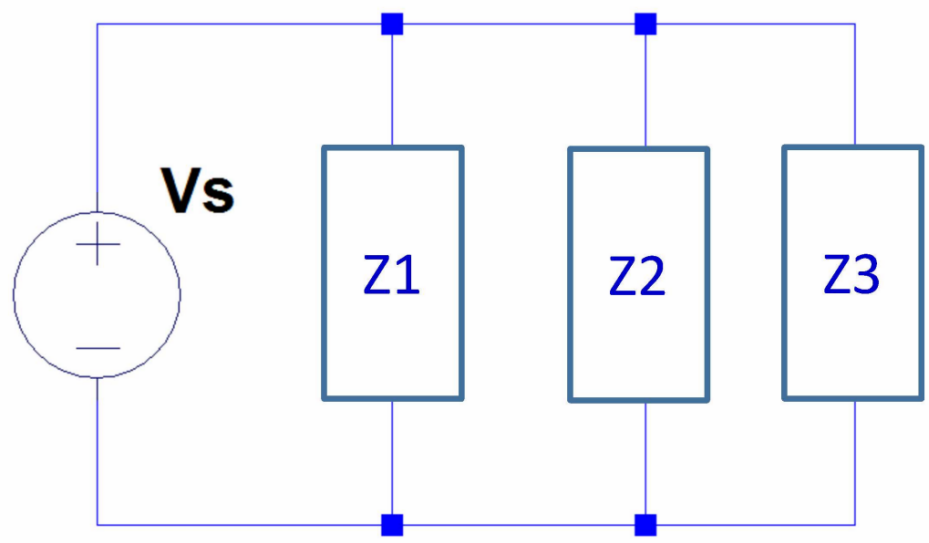


1) Power Circuits (30 points)



In this circuit, the total source power, S, is 50,000 VA with a 60 Hz, 1,000 VRMS voltage. The power factor for the entire parallel load is 0.86 leading . The loads are described below:

w=120pi
Z#=Zq j + Zr = Zs<theta
P=V^2/Z*

Vsource=1000sqrt2<0

Z1: Capacitive load with value you specifiy 2.3 μF
Z1 = -1153.29j + 0 = 1153.29<-90 1000^2/((1153.29j+0)=-867.08j+0=867.08<-90

0/867=0

Z2: Inductive load L= 0.2 H with real loss, R=5.7 Ω,
Z2 = 75.40j + 5.7 = 75.61<85.67 1000^2/(-75.40j+5.7)=13187.54j+996.97=13225.17<85.68

Z3: Unknown load

13187/13225=.997

1.1: Determine the values in the table below. Please show all work for full credit! Every box is worth 2 points. Partial credit is not given for wrong answers in boxes.

	real P[W]	imaginary Q [VAR]	aparent |S| [VA]	P/S power factor
Load 1	0	-867.08	867.08	0
Load 2	996.97	13187.54	13225.17	.997
Load 3	42003.04	13194.23	44026.62	.954
Source	43000	25514.70	50,000	0.86 leading

P/50,000=.86
P=43000

50000^2=43000^2+Q^2
Q=sqrt(50000^2-43000^2)

P(3)=P(S)-P(1)-P(2) Q(3)=QP(S)-Q(1)-Q(2) S(3)=sqrt(P(3)^2+Q(3)^2)