ECE470 Power Systems I
Hints for HW # 1

Problems 1, 2, and 3 are all three-phase, so:

$$I_B = \frac{S_B}{\sqrt{3}V_B}$$

Always assume three-phase unless you are told otherwise (as in problem 4.)

Selected answers:

1.	V = 0.9 pu,	Z = 0.2 pu
2.	a) Z = 0.6 pu	b) Z is slightly over 6.3 Ω
3.	a) X_S = 0.005 pu	b) X_S = 0.625 Ω
4.	b) Q = 600 kVAR	d) R = 3.2Ω, X is larger.

Note that S_B, P_B, and Q_B are dimensionally the same, i.e. MVA, MW, and MVAR are really the same units; they just tell you which side of the power triangle you are looking at.

On question 5, note that T_2 is three single-phase transformers and the rating of the bank is 10 x 3 MVA. Also, the Y-connection is 127 kV phase-neutral, so the base voltage is √3 x 127 kV.