ECE 330 HW 1

Copies of the textbook are kept at the Grainger Engineering Library Reserve

Textbook problem 2.1 (Partial answer: 0.707 leading)

Textbook problem 2.2 (Partial answers: -250, -500, 500, 0, 150, 1900, -150)

Textbook problem 2.8

Textbook problem 2.9

Textbook problem 2.10 (Partial answer: 100 Amps)

Special Problem #1

A single-phase source is supplying passive loads through two wires. The impedance of each wire is $(0.05 + j0.05)\Omega$. The load is connected between the two wires at the far end. The load current is 75 Amps (RMS).

1. What is the source voltage that you need in order to have 120V (RMS) across the load when the power factor of the load is unity? (Answer: 128V)

2. Repeat for the case where the load power factor is 0.707 lagging. (Answer: 131V)

3. Repeat for the case where the load power factor is 0 leading. (Answer: 113V)

Special Problem #2

Three single-phase loads are connected in parallel across a 60Hz source supplying 240V.
Load #1: 6 kVA at 0.8 power factor lag
Load #2: 4 kW at 0.9 power factor lag
Load #3: 13 Amps at unity power factor

1. Find the total complex power consumed by these three loads.

2. Find the source current magnitude. (Answer: 54.76 Amps)