

**EE332 Introduction to Power Systems Engineering Homework 1****Assigned 8/22/07 Due 8/27/07****Homework is normally due Mondays. This due date is an exception.**

0. Text Problems 2.1, 2.2, 2.9

Comments:

1. The problems above are a review of the sinusoidal steady state ac circuit analysis chapter in EE211. Exponential form is Euler form.

2. When writing a sinusoidal time function as a phasor, we will always express the magnitude of the phasor in RMS (root mean square). Recall that for a pure sinusoid RMS is the Peak value/ $\sqrt{2}$ .

3. Hint for 2.2 c

Expand using identities for  $\cos(A+B)$  and  $\sin(A+B)$ , combine sine and cosine terms and use identities again.

Or

Convert each term to phasor, add the complex numbers, convert back to time function

4. Hint for problem 2.9 : Use KVL

Some Answers:

2.1 b.  $5/\underline{233.13^\circ}$

2.2a  $400/\underline{-30^\circ}$

2.9  $117.9/\underline{-14.7^\circ}$

1. At what voltage(s) does El Paso Electric deliver Power to your house?

What is the frequency of the delivered voltage?

What is the largest amount of Power that you use (kilowatts). Guesses accepted?

How many power outages did you have last year?

2. Look at your (or a friend's) electric bill

What is the monthly energy use?

What is the rate?

What are the components of the rate?

Are there surcharges?

3. The NM power system is part of WECC

Do a web search to answer the following questions

- What is WECC?
- What is the generation capacity (MW) in WECC
- What is the generation mix (% nuclear, hydro, etc.)
- What is the highest transmission line voltage in WECC
- Where do EHV (345 kV) lines serving the Las Cruces originate

Good sites to look at are <http://www.wecc.biz/documents/daily/2008/March/20080303.pdf>  
(Unit for Demand is MW)

[http://www.wecc.biz/documents/library/publications/infosum/2006\\_infosum.pdf](http://www.wecc.biz/documents/library/publications/infosum/2006_infosum.pdf)

<http://www.eia.doe.gov/>

4. What is the name of NMSU's graduate power program?

Reading Assignment – All of Chapter 1, Chapter 2.1-2.3