ECE 111 - Homework #12

Complex Numbers
Due Monday, November 13th

Complex Numbers

1) Determine the rectangular or polar form of each complex number

- $7+j9$
- $2-j3$
- $4\angle 50^0$
- $9\angle -22^0$

2) Determine y as a complex number

- $y=(2+j3)+(7-j6)+(-2+j12)$
- $y=(7\angle 20^0)+(8\angle -63^0)+(2\angle 79^0)$

3) Determine y as a complex number

- $y=\left(\frac{(2+j12)(9-j3)}{(7-j6)}\right)$
- $y=\left(\left(\frac{2+j12}{7-j6}\right)+\left(\frac{9-j3}{7+j6}\right)\right)\left(\frac{4+j2}{8+j3}\right)$

4) Determine y as a complex number

- $y=e^{(2+j3)}$
- $y=\ln(2+j3)$
- $y=(2+j3)^{(4+j5)}$

Partial Fractions with Complex Numbers

5) Determine the partial fraction expansion

$$\left(\frac{10(x+1)(x+2)}{(x+1+j2)(x+1-j2)(x+5)}\right)=\left(\frac{a}{x+1+j2}\right)+\left(\frac{b}{x+1-j2}\right)+\left(\frac{c}{x+5}\right)$$

6) Determine the partial fraction expansion

$$\left(\frac{(x+j)(x-j)}{x(x+3)(x+2+j5)(x+2-j5)}\right)=\left(\frac{a}{x+0}\right)+\left(\frac{b}{x+3}\right)+\left(\frac{c}{x+2+j5}\right)+\left(\frac{d}{x+2-j5}\right)$$