ECE 111 - Make-Up Homework #12

Complex Numbers

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

- $3 + j5$
- $7 - j6$
- $6\angle 75^0$
- $8\angle - 120^0$

2) Determine y as a complex number

- $y = (3 + j5) + (7 - j6) + (2 + j7)$
- $y = (7\angle 35^0) + (8\angle 65^0) + (9\angle - 22^0)$

3) Determine y as a complex number

- $y = \left(\frac{(3+j5)(4-j6)}{(2-j3)} \right)$
- $y = \left(\left(\frac{3+j5}{2-j3} \right) + \left(\frac{4-j6}{1+j3} \right) \right) \left(\frac{2+j4}{6-j1} \right)$

4) Determine y as a complex number

- $y = e^{(1+j3)}$
- $y = \ln(1 + j3)$
- $y = (1 + j3)^{(2+j4)}$

Partial Fractions with Complex Numbers

5) Determine the partial fraction expansion

$$\left(\frac{3(x+1)(x+2)}{(x+j4)(x+j4)(x+5)} \right) = \left(\frac{a}{x+j4} \right) + \left(\frac{b}{x-j4} \right) + \left(\frac{c}{x+5} \right)$$

6) Determine the partial fraction expansion

$$\left(\frac{8(x+j2)(x-j2)}{(x+1)(x+3)(x+5+j)(x+5-j)} \right) = \left(\frac{a}{x+1} \right) + \left(\frac{b}{x+3} \right) + \left(\frac{c}{x+5+j} \right) + \left(\frac{d}{x+5-j} \right)$$