ECE 111 - Homework #12

Complex Numbers - Make-Up Homework Sets - Fall 2024

Complex Numbers

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

- $-7 + j$
- $-1 - j10$
- $7\angle - 125^0$
- $8\angle - 37^0$

2) Determine y as a complex number

- $y = (1 - j7) + (5 - j) + (-8 - j5)$
- $y = (10\angle - 84^0) + (5\angle 79^0) + (9\angle - 99^0)$

3) Determine y as a complex number

- $y = \left(\frac{(1-j7)(5-j)}{(-8-j5)} \right)$
- $y = \left(\left(\frac{7-j8}{-20-j5} \right) + \left(\frac{6-j}{8-j6} \right) \right) \left(\frac{-5-j7}{-7+j7} \right)$

4) Determine y as a complex number

- $y = e^{(2+j)}$
- $y = \ln(-7 + j7)$
- $y = (2 - j3)^{(3-j2)}$

Partial Fractions with Complex Numbers

5) Determine the partial fraction expansion

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

6) Determine the partial fraction expansion

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