EE 261

Homework # 6—Complex-Number Arithmetic

(Aziz Inan)

1. Which of the following is equal to $(-9)^{0.5}$?

a. $\pm j9$ b. $\pm j3$ c. -0.45 d. -8.5 e. ± 3

2. Which of the following is approximately equal to $3 - j4$ in polar form?

a. $5e^{-j36.87^\circ}$ b. $5e^{j126.87^\circ}$ c. $7^{0.5}e^{-j53.13^\circ}$ d. $25e^{-j53.13^\circ}$ e. $5e^{-j53.13^\circ}$

3. Which of the following rectangular-form complex numbers is approximately equal to $4e^{j2\pi/3}$?

a. $-2+j3.464$ b. $3.464+j2$ c. $2+j3.464$ d. $3.464-j2$ e. $2-j3.464$

4. Which of the following equal $e^{-j\pi/3}-e^{j\pi/3}$?

a. 0 b. j c. $-j3^{0.5}$ d. $j3^{0.5}$ e. $-j$

5. Which of the following is equal to $(j^{2015}+j^{2016})/\ j^{2017}$?

a. $-1-j$ b. $1-j$ c. $-1+j$ d. -1 e. $1+j$

6. Which of the following equal $(3+j4)/(4-j3)$?

a. $e^{-j0.09\pi}$ b. $e^{j0.09\pi}$ c. j d. $-j$ e. -1

7. Which of the following I values satisfy the equation given by $(9+j5)I+(15-j36)I+j7I=48(1+j)$?

a. -2 b. $j2$ c. $-j2$ d. 2 e. 1

8. Which of the following is approximately equal to $2j(1+j)/[(-1+j)(j4+3)]$?

a. $0.4e^{j53.13^\circ}$ b. $0.4e^{-j53.13^\circ}$ c. $(0.4)2^{0.5}\ e^{-j53.13^\circ}$ d. $2.5\ e^{j53.13^\circ}$ e. $0.4e^{-j36.87^\circ}$

9. Which of the following is approximately equal to $(e^{j\pi/2}-j\pi/2)/(2/\pi-e^{-j\pi/2})$?

a. $1.524e^{-j147.5^\circ}$ b. $1.807e^{j32.48^\circ}$ c. $1.807e^{-j147.5^\circ}$ d. $1.524e^{j147.5^\circ}$ e. $1.524e^{-j32.48^\circ}$

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10. Which of the following is equal to $j(e^{j\pi/2}-e^{-j\pi/2})/[2(1+j)]$?

a. $2^{-0.5}e^{-j\pi/2}$ b. $2^{-0.5}e^{-j3\pi/4}$ c. $2^{-0.5}e^{j3\pi/4}$ d. $2^{-0.5}e^{-j\pi/4}$ e. $0.25e^{-j\pi/4}$

11. Which of the following is equal to $(j2-2)/[(2(1+j)e^{-j\pi/2}]$?

a. $1-j$ b. $-j$ c. j d. 1 e. -1

12. Which of the following is equal to $4j(1+j2)e^{-j\pi/3}/[(j-2)(e^{-j2\pi/3}+1)]$?

a. -2.309 b. 2.309 c. j2.309 d. 4 e. -4

Euler's formulas:

$\cos\theta=(e^{j\theta}+e^{-j\theta})/2;\ \sin\theta=(e^{j\theta}-e^{-j\theta})/(j2)$