

ENEE 222: 2/05 Class

Material: Lecture videos 2.2, 2.3, 3.1

1. Which (one or more) of the following expressions equals

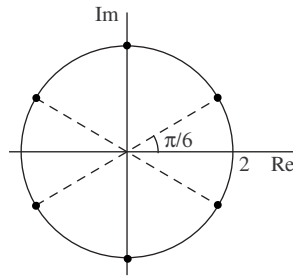
$$\frac{3+j}{j} ?$$

- A. $10/(1+3j)$
- B. $1+3j$
- C. $1-3j$
- D. $-(1+j)(1+2j)$

2. If $\angle z = 3\pi/7$, for which (one or more) of the following choices of n is z^n real-valued?

- A. $n = 28$
- B. $n = 17$
- C. $n = 3$
- D. $n = 35$

3. Which of the following equations is satisfied by all six points z marked with \bullet below?



- A. $z^3 = 8$
- B. $z^3 = 8j$
- C. $z^6 = 64$
- D. $z^6 = -64$

4. (HW 2 iii) If $v = -3 + j\sqrt{3}$, determine all the roots z of the equation

$$z^4 - v^4 = 0$$

and plot them on the complex plane.

5. (HW 2 vi) Sketch the line or curve described by the equation

$$\Re\{z\} = \Im\{2z^*\}$$

6. (HW 1 vi) Determine the only *real* values of a and b such that

$$z^2 + az + b = 0$$

has $z = 5 - 14j$ as a root.

7. (HW 1 iv) Express the modulus and angle of $v = z_1^* \cdot z_2^{-3}$ in terms of those (moduli and angles) of z_1 and z_2 .

8. (HW 1 vii) What complex number has angle equal to $\angle(z_1 + z_2) - \angle z_1$? Compute that number and show that its angle is (indeed) a multiple of $\pi/4$. (*Easier approach than in the given hint.*)