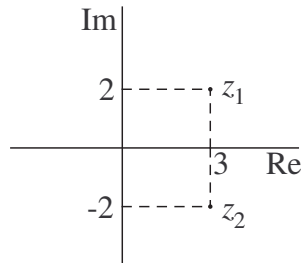


ENEE 222: 1/31 Class

Material: Lecture videos 1, 2.1

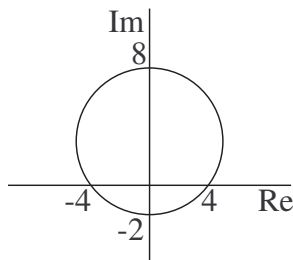
1. If z_1 and z_2 are as plotted below, what is the angle of the difference $z_1 - z_2$?



- A. 0
B. $\pi/2$
C. π
D. $-\pi/2$
2. If the complex number z has modulus r and angle θ , which of the following is true about the complex number

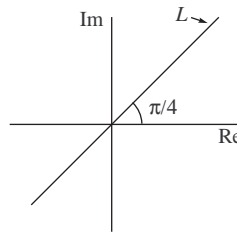
$$w = -3z ?$$

- A. $|w| = 3|z|$ and $\angle w = -\theta$
B. $|w| = 3|z|$ and $\angle w = \theta + \pi$
C. $|w| = -3|z|$ and $\angle w = \theta$
D. $|w| = 9|z|$ and $\angle w = -\theta$
3. Which of the following equations describes the circle shown below?



- A. $|z| = 4$
B. $|z| = 5$
C. $|z - 3| = 5$
D. $|z - 3j| = 5$

4. Which (one or more) of the following equations describe the line \mathcal{L} shown below?



- A. $|z - 1| = |z - j|$
- B. $|z - 1| = |z + j|$
- C. $|z - 2| = |z - 2j|$
- D. $|z + 1| = |z + j|$

5. (HW 1 C iii)

If

$$z_1 = 2 - 3j \quad \text{and} \quad z_2 = -1 + 8j ,$$

express $2z_1 - z_2$ in both Cartesian and polar form.

6. (HW 2 C i)

Express $v = -3 + j\sqrt{3}$ in polar form.

7. (HW 2 v)

With v as above, sketch the line described by the equation

$$|z - v| = |z|$$

and determine the point at which it intersects the real axis.

8. (HW 2 D ii)

Now let $u = 1 - j$. On the complex plane, sketch the set of points z of the form $z = u + av$, where a is a real scaling factor. Determine the values of a such that

$$|u + av| = \sqrt{2}$$