

Name: _____

Print and complete this assessment. It is due at the beginning of class on Tuesday February 5.

Circle the most appropriate response for each.

Module 1 Computation

1. Let $z = 3 - 4i$. Find z^{-1} .
 - A. $\frac{3}{25} + \frac{4}{25}i$
 - B. $-\frac{3}{25} + \frac{4}{25}i$
 - C. $\frac{4}{25} - \frac{3}{25}i$
 - D. None of these.

2. Simplify $\overline{\sqrt{2} - 3i - i(5 - i\sqrt{2})}$.
 - A. $-5\sqrt{2} + 3i$
 - B. $7\sqrt{2} - 1 + i$
 - C. $2\sqrt{2} - 2i$
 - D. None of these.

3. Find the exponential form $re^{i\theta}$ of $z = 2 - 2i\sqrt{3}$.
 - A. $4e^{-i\pi/3}$
 - B. $6e^{-i\pi/6}$
 - C. $8e^{i\pi/4}$
 - D. None of these.

4. Express $(-\sqrt{3} + i)^{-3}$ in $x + iy$ form.
 - A. $-\frac{1}{8}i$
 - B. $\frac{1}{4} - \frac{1}{32}i$
 - C. $-\frac{1}{16}$
 - D. None of these.

5. If $z = e^{5i\pi/4}$, then what is its *principle* argument $\text{Arg}(z)$?
 - A. $-7\pi/4$
 - B. $-3\pi/4$
 - C. $5\pi/4$
 - D. None of these.

Module 1 Knowledge

Circle the most appropriate response for each.

6. $\overline{z\bar{w}} = \bar{z} + \bar{w}$.
 - A. True
 - B. False
7. The points of the set $\{z \in \mathbb{C} : |z - i| = 4\}$ form a circle.
 - A. True
 - B. False
8. Every complex number may be written in the form $r \cos \theta + ir \sin \theta$.
 - A. True
 - B. False
9. $e^{\theta_1} e^{\theta_2} = e^{\theta_1 \theta_2}$.
 - A. True
 - B. False
10. The equation $z^3 = 4 - 3i$ has a unique solution.
 - A. True
 - B. False

Module 1 Proofs

Choose at most one of the following exercises to submit to the instructor on a separate page.

11. The statement $Im(z) = \frac{z+\bar{z}}{2i}$ is false. Fix the formula and prove that your fixed formula is true.
12. Let w, z be nonzero complex numbers. Prove that the multiplicative inverse of wz is the product of the multiplicative inverse of w with the multiplicative inverse of z .
13. Prove that for any value of $arg(\frac{z}{z})$, there exists an equal value for $-arg(z)$.