AOS Math 10 -- Spring 2024  
Major Summative #11 (NO Calculator)  
*Introduction to Complex Numbers  
\_\_\_\_\_\_\_/*



Honesty and integrity are the foundations of good academic work. Whether you are working on a problem set, lab report, project, presentation, or paper, do not engage in plagiarism, unauthorized collaboration, cheating, or facilitating academic dishonesty. Our expectation is for our students to be successful while being trustworthy. The honor code is not intended to be punitive, but rather a guide for all students and faculty to follow. For these reasons, the Academies of Loudoun will uphold the following Honor Code:

*On my honor, I have not accepted or provided any unauthorized aid on this test, quiz, or assignment.*

As an Academies of Loudoun student, you agreed to uphold the Academies Honor Code. Please write the Honor Code Pledge below and sign this document.

**Student Signature** **Class** **Date**

1. Write the complex number in polar form.
2. If , find the magnitude of .
3. Simplify the expression .
4. Multiply the complex numbers and , and present your answer in   
   rectangular form.
5. Given , express in rectangular form.
6. If , find and simplify .
7. Divide by , and express your answer in the form .
8. Find the conjugate of the complex number .
9. Calculate the argument of the complex number .
10. If and , find .
11. Express the sum in polar form.
12. For , convert to polar form and find its argument in the range .
13. Simplify the product .
14. Given , normalize (i.e., find the unit vector in the direction of ).
15. If and , show that and represent the same point in the complex plane.
16. Solve the equation for and express your answers in rectangular   
    form.
17. If is one root of a quadratic equation with real coefficients,   
    what is ?
18. Given the complex numbers and , find the product   
    and express it in polar form. Graph each of the three complex numbers in the plane.
19. If , find all values of in polar form.
20. Show that the complex numbers and are conjugates of each other.