AOS Math 10 -- Spring 2024  
Quarter 3 Cumulative (WITH Calculator)  
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**Student Signature** **Class** **Date**

1. Eliminate the parameter : and
2. Eliminate the parameter : and
3. Convert the polar coordinate to rectangular coordinates
4. Convert this equation to polar coordinates:
5. Convert this equation to rectangular coordinates:
6. Which of the following is the graph of
   1. A 3 leaf rose with -intercept
   2. A 6 leaf rose with -intercept
   3. A 3 leaf rose with no intercept
   4. A 6 leaf rose with no intercept
7. A baseball pitcher throws a baseball with an initial speed of 138 feet per second at an angle of 20° to the horizontal. The ball leaves the pitcher’s hand at a height of 4 feet above the ground. Write the equations of motion, and for velocity and for position.
   1. , ,  
       ,
   2. , ,  
       ,
   3. , , ,
   4. , ,  
       ,
8. Let and and find
9. Given , find
10. Given , find a unit vector in the direction of
11. Which vector is perpendicular to
12. Which vector is parallel to
13. What is the radian angle between and
    1. 1.181
    2. 1.281
    3. 1.481
    4. 1.581
    5. 1.781
14. If vector has magnitude 9 and makes an angle of 3.4 radians with the positive axis, find the components of and write as .
15. Write the complex number in polar form.
16. Divide by , and express your answer in the form .
17. Simplify the product .
18. Solve the equation for and express your answers in rectangular form.
19. If is one root of a quadratic equation with real coefficients, what is ?
20. If , find all values of in polar form.
21. Factor into a product of two binomials.
22. (Bonus): By multiplying two complex numbers, prove the addition identities for and .