

Algebra II Practice Test 5**Numeric Response**

1. (1 point) What is the x -coordinate of the vertex of the graph of $f(x) = -7(x - 9)^2 + 3$?
2. (1 point) Find the positive root of $x^2 + 2x - 35 = 0$.

Short Answer

3. (5 points) Simplify $\frac{-2 + 2i}{5 + 3i}$.

4. (5 points) Find the zeros of the function $h(x) = x^2 + 23x + 60$ by factoring.

5. (5 points) Simplify $-8i^{20}$.

6. (5 points) Solve the inequality $x^2 - 14x + 45 \leq -3$ by using algebra.

7. (5 points) Multiply $6i(4 - 6i)$. Write the result in the form $a + bi$.

8. (5 points) Find the absolute value $|-7 - 9i|$.

9. (5 points) A toy rocket is launched from the ground level with an initial vertical velocity of 96 ft/s. After how many seconds will the rocket hit the ground? Use the equation $h(t) = -16t^2 + v_0t + h_0$. (Hint: what will be the final height when the rocket hits the ground?)

10. (5 points) The distance d in meters traveled by a skateboard on a ramp is related to the time traveled t in seconds. This is modeled by the function: $d(t) = 4.9t^2 - 2.3t + 5$. What is the maximum distance the skateboard can travel, and at what time would it achieve this distance? Round your answers to the nearest hundredth. (Hint: find the max value using the formula from the wall)
- _____
- _____
11. (5 points) Write a quadratic function in standard form with zeros 6 and -8 .
- _____
- _____
12. (5 points) Solve the equation $x^2 - 10x + 25 = 54$. Use the Quadratic Formula.
- _____
- _____
13. (5 points) Complete the square for the expression $x^2 - 16x + \underline{\hspace{1cm}}$. Write the resulting expression as a binomial squared.
- _____
- _____
14. (5 points) Express $8\sqrt{-84}$ in terms of i .
- _____
- _____
15. (5 points) Solve the equation $2x^2 + 18 = 0$.
- _____
- _____
16. (5 points) Find the complex conjugate of $3i + 4$.
- _____
- _____
17. (5 points) Find the zeros of $f(x) = x^2 + 7x + 9$ by using the Quadratic Formula.
- _____
- _____
18. (5 points) Subtract. Write the result in the form $a + bi$.
 $(5 - 2i) - (6 + 8i)$
- _____
- _____

19. (5 points) Graph $y \leq -x^2 - 5x + 4$.

20. (5 points) Graph the complex number $-5 + i$.

21. (5 points) Consider the function $f(x) = -4x^2 - 8x + 10$. Determine whether the graph opens up or down. Find the axis of symmetry, the vertex and the y -intercept. Graph the function.

22. (1 point) Graph $f(x) = x^2 - 5x + 10$ by using a table.

23. (1 point) Using the graph of $f(x) = x^2$ as a guide, describe the transformations, and then graph the function $g(x) = (x + 6)^2 - 2$.

24. (1 point) Using the graph of $f(x) = x^2$ as a guide, describe the transformations, and then graph the function $g(x) = -8x^2$.

25. (1 point) The parent function $f(x) = x^2$ is reflected across the x -axis, vertically stretched by a factor of 10, and translated right 10 units to create g . Use the description to write the quadratic function in vertex form.

26. (1 point) Identify the axis of symmetry for the graph of $f(x) = 4x^2 - 8x + 3$.

27. (1 point) Find the minimum or maximum value of $f(x) = x^2 - 2x - 6$. Then state the domain and range of the function.

28. (1 point) Write the function $f(x) = -5x^2 - 60x - 181$ in vertex form, and identify its vertex.

29. (1 point) Find the values of x and y that make the equation $-9x + 8i = -54 + (16y)i$ true.

30. (1 point) Find the number and type of solutions for $x^2 - 9x = -8$.

31. (1 point) During the eruption of Mount St. Helens in 1980, debris was ejected at a speed of over 440 feet per second (300 miles per hour). The height in feet of a rock ejected at angle of 75° is given by the equation $y(t) = -16t^2 + 425t + 8200$, where t is the time in seconds after the eruption. The rock's horizontal distance in feet from the point of ejection is given by $x(t) = 113t$. Assuming the elevation of the surrounding countryside is 0 feet, what is the horizontal distance from the point of ejection to the where the rock would have landed? Round your answer to the nearest foot.

32. (1 point) The daily profit P that a bakery makes can be modeled by the function $P(x) = -15x^2 + 330x - 815$. (Note that profit does not increase linearly with price because a higher price usually means fewer total pizzas sold.) What must be the price of each loaf of bread to provide a daily profit of at least \$600? (Round your answer to the nearest dollar.)

33. (1 point) What expression is equivalent to $(3 - 2i)^2$?
