

Algebra II
Solving Quadratics Review

Name _____

DO ALL WORK ON SEPARATE PAPER!!!

For each of the following quadratics, determine

- If the graph opens up or down
- Coordinates of the vertex
- If the vertex is a maximum or minimum
- Equation of the axis of symmetry
- Coordinates of the y-intercept
- Factor and find the coordinates of the x-intercepts
- Graph the quadratics using the vertex, y-intercept and zeros.

1. $y = x^2 + 2x - 1$

2. $f(x) = -x^2 - 6x + 8$

3. $y = 2x^2 - 7x + 3$

4. $f(x) = x^2 - 4$

Solve the equations by graphing. Check your solution(s).

5. $x^2 - x - 12 = 0$

6. $x^2 = 5x - 6$

Solve the following equations by taking square roots.

7. $3(x + 1)^2 - 4 = 5$

8. $\frac{4}{3}x^2 = \frac{2}{3}x^2 + 6$

Solve the following by factoring.

9. $-w^2 - 3w - 7 = -2w^2 + 3$

10. $3k^2 + 2k = 2k^2 + 11k$

Solve by using the quadratic formula.

11. $-7x = 2x^2 + 9$

12. $2x^2 + 12x = -18$

Solve using any method.

13. $x^2 - 121 = 0$

14. $9x^2 + 4 = 12x$

Find the discriminant and describe the types of solutions and number of x-intercepts

15. $x^2 = 4x + 1$

16. $3t^2 - 3t = -8$

17. Find a possible pair of integer values for a and c if $ax^2 + 8x + c = 0$ has one real solution.
(There is more than one possible solution)

Simplify.

18. $(9 + 6i) - (15 - 7i)$

19. $13 - (5 + i) + 7i$

20. $(3 - 2i)^2$

21. $(4 - 2i)(3 - i)$

22. $(4i)^2$

23. i^{725}

Find the zeros of the following functions.

24. $f(x) = 5x^2 + 15$

25. $g(x) = x^2 + 7x - 18$

26. A water balloon is tossed into the air so that its height h (in feet) after t seconds can be modeled by the function $h(t) = -16t^2 + 80t + 5$

a. What is the height of the balloon after 1 second?

b. What is the maximum of height of the balloon?

c. At what time does the balloon reach its maximum height?

Solve the following systems with your graphing calculator.

27. $y - 2x^2 + 6 = 0$

$y = -(x - 3)^2 + 8$

28. $8x + y = -2x^2 - 8$

$x^2 - y - 6x = -10$

29. $y = (x - 3)^2 + 5$

$y = 5$

Write each expression as a complex number.

30. $\sqrt{-25} - \sqrt{-9} + \sqrt{-81}$

31. $\sqrt{-27} + \sqrt{-49} - \sqrt{-64}$

32. Write the quadratic equation in vertex form. Then identify the vertex. $f(x) = x^2 - 6x - 2$

33. A rectangular lawn measuring 24 feet by 16 feet is surrounded by a flower bed of uniform width. The combined area of the lawn and the flower bed is 660 square feet. What is width of the flower bed?

34. Jason jumped off of a cliff into the ocean in Acapulco while vacationing with some friends. His height as a function of time could be modeled by the function $h(t) = -16t^2 + 16t + 480$ where t is the time in seconds and h is the height in feet.

a. How long did it take for Jason to reach his maximum height?

b. What was the highest point that Jason reached?

c. When did Jason hit the water?