Algebra 2 - Chapter 3 Test Review

Short Answer

Solve the equation.

1. $-x^2 - 10x - 25 = 0$

2. $18 = -x^2 + 6x$

3. $(x-5)^2 = -49$

4. $3(x+6)^2 - 5 = 2$

5. $-4y + 9 + y^2 = 4y + 2y^2$

6. $p^2 + 4p = 0$

7. $x^2 - 3 = -23$

8. $x^2 - 14x + 49 = 21$

9. $x^2 - 20x + 100 = -3$

10. $x^2 + 6x + 28 = 0$

11. $3x^2 + 7x = 9 - 5x$

12. $2x^2 - 9x + 6 = 0$

13. $-3x^2 - 18x - 27 = 0$

14. $-x^2 - 2x = 37$

15. $(-x+5)(x+10) - 35 = (x+5)(x+2) + 25$

Find the zero(s) of the function.

16. $f(x) = x^2 + 10x + 25$

17. $h(x) = 4x^2 - 64x + 252$

18. $h(x) = -x^2 - 75$

Find the square root of the number.

19. $\sqrt{-320}$

Find the values of x and y that satisfy the equation.

20. $2x - 35i = -6 - 7yi$

Perform the operation. Write the answer in standard form.

21. $4 + (5 + 19i) + 17i$

22. $(-9 + 9i)(-6 + i)$

23. The height y (in feet) of a dodgeball t seconds after it is thrown can be modeled by the function $y = -16t^2 + 64t + 5$. Write the function in vertex form. Then find the maximum height of the dodgeball.

24. A boy throws a ball into the air. The equation $h = -16t^2 + 33t + 4$ models the path of the ball, where h is the height (in feet) of the ball t seconds after it is thrown. How long is the ball in the air? Round your answer to the nearest tenth of a second.

Solve the system.

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

    $y = -2x^2 - 3x - 5$

26. $-x + y = -3$

    $3x^2 + 11x + y = 33$

27. $y = 3x^2 - 3x + 6$

    $4 - y = 2x^2 + 4x$

28. $y = x^2 + 2$

    $-10 = -x^2 - y$

Solve the inequality. Round decimal answers to the nearest hundredth.

29. $x^2 + 13x + 36 > 0$

30. $x^2 + 11x > -18$

31. $x^2 + 3x - 5 > 0$

32. $x^2 + 8x < 3$

33. Graph $y > -2(x - 2)^2 - 3$.

Graph the system of quadratic inequalities.

34. $y \geq -4x^2$

    $y < 2x^2 + 2$

35. $y \geq x^2 + 3x - 2$

    $y \geq x^2 - 3x + 2$

Algebra 2 - Chapter 3 Test Review
Answer Section

SHORT ANSWER

1. ANS:
   $x = -5$

   PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.1
   NAT: HSA-SSE.A.2
   KEY: solving quadratic equations by graphing | solving quadratic equations | quadratic equation in one variable
   NOT: Example 1

2. ANS:
   no real solution

   PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.1
   NAT: HSA-SSE.A.2
   KEY: solving quadratic equations by graphing | solving quadratic equations | quadratic equation in one variable
   NOT: Example 1

3. ANS:
   no real solution

   PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.1
   NAT: HSA-SSE.A.2 | HSA-REI.B.4b
   KEY: solving quadratic equations using square roots | solving quadratic equations | quadratic equation in one
   variable   NOT: Example 2

4. ANS:
   $x = -6 \pm \dfrac{\sqrt{21}}{3}$

   PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.1
   NAT: HSA-SSE.A.2 | HSA-REI.B.4b
   KEY: solving quadratic equations using square roots | solving quadratic equations | quadratic equation in one
   variable   NOT: Example 2

5. ANS:
   $y = 1$ and y = -9

   PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.1
   NAT: HSA-SSE.A.2 | HSA-REI.B.4b | HSF-IF.C.8a
   KEY: solving quadratic equations by factoring | solving quadratic equations | quadratic equation in one variable
   NOT: Example 3

6. ANS:
    $p = 0$ and $p = -4$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.1
    NAT: HSA-SSE.A.2 | HSA-REI.B.4b | HSF-IF.C.8a
    KEY: solving quadratic equations by factoring | solving quadratic equations | quadratic equation in one variable
    NOT: Example 3
7. ANS:
    $x = \pm 2i\sqrt{5}$

    PTS: 1   DIF: Level 2   REF: Algebra 2 Sec. 3.2
    NAT: HSN-CN.A.1 | HSN-CN.C.7 | HSA-REI.B.4b
    KEY: solving quadratic equations | complex solutions and zeros | quadratic equation
    NOT: Example 6
8. ANS:
    $x = 7 \pm \sqrt{21}$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.3
    NAT: HSA-REI.B.4b
    KEY: solving quadratic equations using square roots | quadratic equation | solving quadratic equations
    NOT: Example 1
9. ANS:
    $x = 10 \pm i\sqrt{3}$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.3
    NAT: HSA-REI.B.4b
    KEY: solving quadratic equations using square roots | quadratic equation | solving quadratic equations
    NOT: Example 1
10. ANS:
    $x = -3 \pm i\sqrt{19}$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.3
    NAT: HSN-CN.C.7 | HSA-REI.B.4b
    KEY: solving quadratic equations by completing the square | quadratic equation | solving quadratic equations
    NOT: Example 3
11. ANS:
    $x = -2 \pm \sqrt{7}$

    PTS: 1   DIF: Level 2   REF: Algebra 2 Sec. 3.3
    NAT: HSN-CN.C.7 | HSA-REI.B.4b
    KEY: solving quadratic equations by completing the square | quadratic equation | solving quadratic equations
    NOT: Example 4

12. ANS:

    $$x = \frac{9 \pm \sqrt{33}}{4}$$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.4
    NAT: HSA-REI.B.4b
    KEY: solving quadratic equations | quadratic equation | two real solutions | Quadratic Formula | solving quadratic equations using the Quadratic Formula   NOT: Example 1

13. ANS:
    $x = -3$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.4
    NAT: HSN-CN.C.7 | HSA-REI.B.4b
    KEY: solving quadratic equations | quadratic equation | one real solution | Quadratic Formula | solving quadratic equations using the Quadratic Formula   NOT: Example 2

14. ANS:
    $x = -1 \pm 6i$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.4
    NAT: HSN-CN.C.7 | HSA-REI.B.4b
    KEY: solving quadratic equations | quadratic equation | two imaginary solutions | Quadratic Formula | solving quadratic equations using the Quadratic Formula   NOT: Example 3

15. ANS:
    no solution

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.5
    NAT: HSA-CED.A.3 | HSA-REI.D.11
    KEY: solving quadratic equations by graphing | solving quadratic equations | quadratic equation
    NOT: Example 5

16. ANS:
    $x = -5$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.1
    NAT: HSA-SSE.A.2 | HSA-REI.B.4b | HSF-IF.C.8a
    KEY: finding zero(s) of quadratic functions | quadratic function |zero of a function | quadratic equation in one variable   NOT: Example 4

17. ANS:
    $x = 7$ and $x = 9$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.1
    NAT: HSA-SSE.A.2 | HSA-REI.B.4b | HSF-IF.C.8a
    KEY: finding zero(s) of quadratic functions | quadratic function |zero of a function | quadratic equation in one variable   NOT: Example 4

18. ANS:
$x = \pm 5i\sqrt{3}$

    PTS: 1   DIF: Level 2   REF: Algebra 2 Sec. 3.2
    NAT: HSN-CN.A.1 | HSN-CN.C.7 | HSA-REI.B.4b
    KEY: finding zero(s) of quadratic functions | complex solutions and zeros | quadratic function
    NOT: Example 7

19. ANS:
$8i\sqrt{5}$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.2
    NAT: HSN-CN.A.1   KEY: finding square roots of numbers
    NOT: Example 1

20. ANS:
$x = -3$ and $y = 5$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.2
    NAT: HSN-CN.A.1   KEY: complex number
    NOT: Example 2

21. ANS:
$9 + 36i$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.2
    NAT: HSN-CN.A.1 | HSN-CN.A.2   KEY: adding or subtracting complex numbers
    NOT: Example 3

22. ANS:
$45 - 63i$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.2
    NAT: HSN-CN.A.1 | HSN-CN.A.2   KEY: multiplying complex numbers
    NOT: Example 5

23. ANS:
$y = -16(t-2)^2 + 69;\ 69$ ft

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.3
    NAT: HSA-REI.B.4b | HSF-IF.C.8a   KEY: application | quadratic function | maximum value
    NOT: Example 6-1

24. ANS:
about 2.2 sec

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.4
    NAT: HSA-REI.B.4b   KEY: quadratic equation | application
    NOT: Example 6-1

25. ANS:
    no solution

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.5
    NAT: HSA-CED.A.3 | HSA-REI.C.7
    KEY: solving systems of nonlinear equations by graphing | system of nonlinear equations | solving systems of
    nonlinear equations | graph of a system of nonlinear equations
    NOT: Example 1

26. ANS:
    $(-6,-9)$ and $(2,-1)$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.5
    NAT: HSA-CED.A.3 | HSA-REI.C.7
    KEY: solving systems of nonlinear equations by substitution | system of nonlinear equations | solving systems
    of nonlinear equations   NOT: Example 2

27. ANS:
    $(2,12)$ and $(5,66)$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.5
    NAT: HSA-CED.A.3 | HSA-REI.C.7
    KEY: solving systems of nonlinear equations by elimination | system of nonlinear equations | solving systems
    of nonlinear equations   NOT: Example 3

28. ANS:
    $(-2,6)$ and $(2,6)$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.5
    NAT: HSA-CED.A.3 | HSA-REI.C.7
    KEY: solving systems of nonlinear equations by substitution | system of nonlinear equations | solving systems
    of nonlinear equations   NOT: Example 4

29. ANS:
    $x < -9$ or $x > -4$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.6
    NAT: HSA-CED.A.1 | HSA-CED.A.3   KEY: quadratic inequality in one variable
    NOT: Example 4

30. ANS:
    $x < -9$ or $x > -2$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.6
    NAT: HSA-CED.A.1 | HSA-CED.A.3   KEY: quadratic inequality in one variable
    NOT: Example 4

31. ANS:
    about $x < -4.19$ or $x > 1.19$
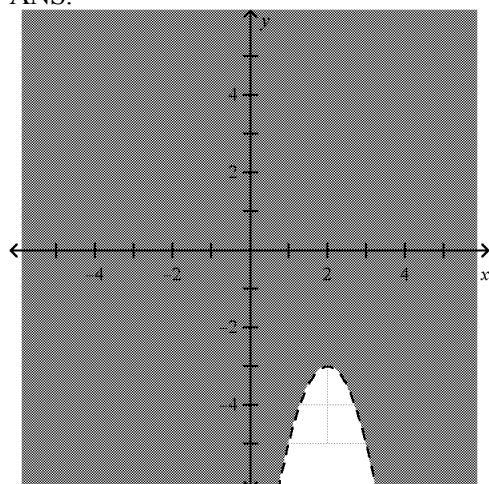
    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.6
    NAT: HSA-CED.A.1 | HSA-CED.A.3
    KEY: quadratic inequality in one variable | solving quadratic inequalities | graph of a quadratic inequality
    NOT: Example 5

32. ANS:
    about $-8.36 < x < 0.36$

    PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.6
    NAT: HSA-CED.A.1 | HSA-CED.A.3
    KEY: quadratic inequality in one variable | solving quadratic inequalities | graph of a quadratic inequality
    NOT: Example 5

33. ANS:

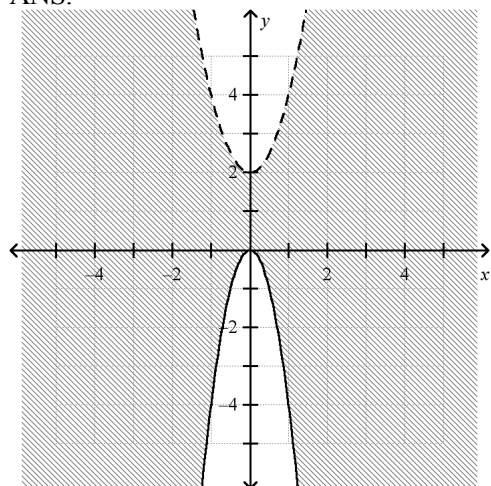   PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.6
    NAT: HSA-CED.A.1 | HSA-CED.A.3
    KEY: quadratic inequality in two variables | graphing quadratic inequalities in two variables | graph of a quadratic inequality   NOT: Example 1
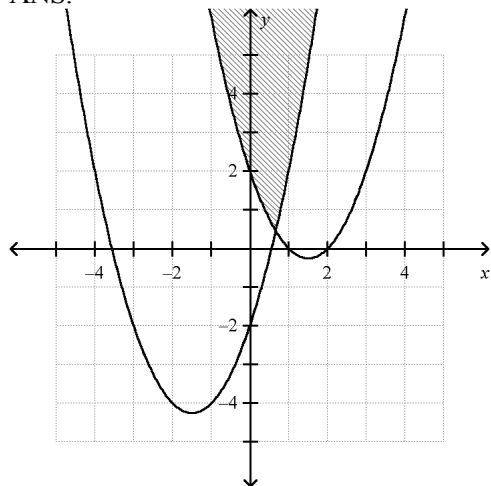
34. ANS:

PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.6
NAT: HSA-CED.A.1 | HSA-CED.A.3
KEY: graphing systems of quadratic inequalities | quadratic inequality in two variables | system of quadratic inequalities   NOT: Example 3

35. ANS:

PTS: 1   DIF: Level 1   REF: Algebra 2 Sec. 3.6
NAT: HSA-CED.A.1 | HSA-CED.A.3
KEY: graphing systems of quadratic inequalities | quadratic inequality in two variables | system of quadratic inequalities   NOT: Example 3