Algebra 2 Honors Unit 3 Practice Packet 2022

Date	Day	Class Meeting Information	Assignment (due the next class meeting)
10/10/2022 10/11/2022	Monday Tuesday	3.1 Factor and Solve Quadratics	**Factor and Solve Quadratics** HW: 3.1 Practice
10/12/2022 10/13/2022	Wednesday Thursday	3.2 Solve by Square Rooting	**3.2 Solve By Square Rooting** HW: 3.2 Practice
10/14/2022 10/17/2022	Friday Monday	3.3 Graphs of Quadratics	**3.3 Intro to Graphing Quadratics** HW: 3.3 Practice
10/18/2022 10/19/2022	Tuesday Wednesday	3.4 Completing the Square	**3.4 Completing the Square** HW: 3.4 Practice
10/20/2022 10/21/2022	Thursday Friday	3.5 Standard Form	**3.5 Standard Form** HW: 3.5 Practice
10/24/2022 10/25/2022	Monday Tuesday	3.6 Modeling Quadratics	**3.6 Modeling Quadratics** HW: 3.6 Practice
10/26/2022 10/27/2022	Wednesday Thursday	Quadratics Unit Review	**Chapter 3 Practice Test** HW: 3 Practice Test
10/31/2022 11/01/2022	Monday Tuesday	Quadratics Unit Test Begin Polynomials	**Chapter 3 Test** HW: 4.0 Practice

- Be prepared for daily quizzes
- All worksheets, notes, and video links are on the math dept website: www.washoeschools.net/DRHSmath
- Students who complete every assignment for the semester are eligible for a 2% grade bonus. Students with no late assignments also get a pizza party!
- Show the original problem, all work, and solutions on your own paper!

3.1 Practice Problems

For #1 – 16, factor each expression completely.

1) $b^2 + 3b - 40$
2) $x^2 - 16$
3) $c^2 + 8c + 16$
4) $m^2 - 16h^8$
5) $k^2 + 81$
6) $2x^2 + 5x + 3$
7) $16g^2 + 8g + 1$
8) $4r^2 - 25$
9) $32y^2 - 2b^2$
10) $-12y^2 + 36y - 27$
11) $2x^3 - 7x^2 + 3x$
12) $4x^2 - 36$
13) $x^4 - 81$

For #14 – 26, solve each equation.

14) $x^2 - 11x + 30 = 0$
15) $r^2 + 2r = 80$
16) $x^2 = 35 - 2x$
17) $m^2 = 7m$
18) $11q^2 - 44 = 0$
19) $6r^2 - 6r + 3 = 8 + r$
20) $4x^2 - 20x + 25 = 0$
21) $14s^2 = 21s$
22) $2x^2 - 8x - 4 = 3x - x^2$
23) $12x^2 + 17x = -6$
24) $9x^2 + 6x + 1 = 0$
25) $2x^2 - 5x = 3$
26) $36x^2 = 100$

3.2 Practice Problems

For # 1 – 7, solve each equation. If needed, use imaginary #s. Leave all answers in radical form, except for #7 (use decimals rounded to the nearest tenth.)

1. $x^2 + 5x - 2 = 0$
2. $2x^2 - 3x + 2 = 0$
3. $x^2 + 5x - 4 = 0$
4. $2x^2 + 2x = 4x - 1$
5. $-2x^2 + 3x + 2 = -2x - 1$
6. $\frac{1}{2}x^2 - 3x + 2 = 3x - 1$
7. $3.8x^2 = 4.7x - 2.1$

For #8 – 11: Vertical Motion Three objects are launched from the top of a 220 foot platform. The first object is launched upward at 25 feet per second. The second object is dropped. The third object is launched downward at 15 feet per second.

8) Write a height model for the first object.
9) Write a height model for the second object.
10) Write a height model for the third object.
11) How many seconds until each object hits the ground?

For #12 – 17, solve each equation. Leave all answers in radical form.

12) $x^2 - 324 = 0$ 13) $x^2 - 19 = 0$ 14) $\frac{1}{2}x^2 + 3 = 12$ 15) $4(x + 5)^2 = 64$

16) $3(x - 3)^2 + 2 = 26$ 17) $\frac{1}{3}(x+4)^2 - 1 = 5$

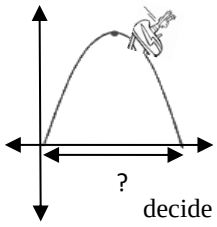
continued

18) A rectangular garden has an area of 84 yd^2. The length of the garden is $x + 7$, and the width is $x + 2$. Find the value of x and the dimensions of the garden.

19) A water balloon is tossed from a window 64 feet above the sidewalk. How long does it take for the water balloon to hit the sidewalk if the equation of the water balloon's path is $h = -16t^2 + 64$, where h is the height in feet, and t is the time in seconds?

20) The area of a square rug is 36 m^2. If each side is represented by $2x$, then find the perimeter of the rug.

21) A hill on a roller coaster can be modeled by the equation $y = -3x^2 + 90x$, where x is the horizontal distance and y is the height, in yards. The hill starts and stops at the two zeros of the function. What is the horizontal distance between the start and stop of the hill?



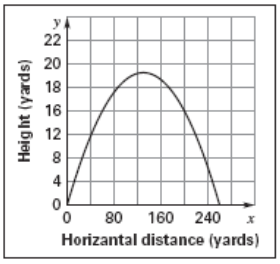
22) You have made a rectangular quilt that is 5 ft by 4 ft. You have 10 square feet of fabric left, and so you decide to make a decorative border of uniform width. What should the width of the quilt's border be?

3.3 Practice Problems

For # 1 – 4, Graph the function. Label the vertex and axis of symmetry and state the domain and range in interval notation.

1) $y = 2(x + 1)^2 + 1$ 2) $y = -3(x - 2)^2 + 2$ 3) $y = -(x + 4)^2 + 14$ 4) $f(x) = -\frac{1}{2}(x + 2)^2 - 1$

5) The flight of a particular golf shot can be modeled by the function $y = -0.001(x - 133)^2 + 19.6$, where x is the horizontal distance (in yards) from the impact point and y is the height (in yards). The graph is shown. How many yards away from the impact point does the golf ball land? What is the maximum height in yards of the golf shot?



6) Given the function, $f(x) = -(x - 4)^2 - 3$, state whether the parabola opens up or down and the maximum or minimum value.

A. Down, Maximum, -3 B. Down, Maximum, 4 C. Up, Maximum, 4 D. Up, Minimum, -3

7) What are the solutions to the quadratic equation, $3x^2 + 7x + 11 = 5x + 7$?

A. $x = \frac{-2 \pm 2i\sqrt{11}}{3}$ B. $x = \frac{-1 \pm 2i\sqrt{11}}{3}$ C. $x = \frac{-1 \pm i\sqrt{11}}{3}$ D. $x = \frac{\pm i\sqrt{11}}{3}$

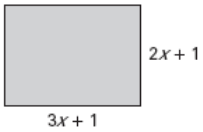
8) Graph $y = -x^2$ over the domain (-2, 1] ∪ [2, 4) 9) Graph $y = x^2 + 4$ over the domain [-1, 2] ∪ (3, 4)

3.3 continued on the next page…

3.3 continued…

10) A rollercoaster's path is modeled by the equation $y = -4(x - 95)^2 + 110$, where x is the horizontal distance and y is the change in height, in yards, from the start of the rollercoaster. What is the maximum height reached by the rollercoaster?

11) The area of the rectangle shown is 22 in^2. Find the value of x.



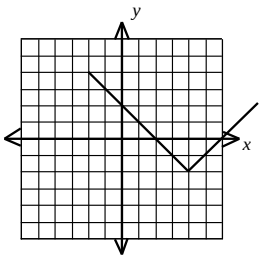
12) Multiple choice: Simplify: $\sqrt{-25} \cdot \sqrt{-36}$ A. $30i$ B. -30 C. 30 D. 900

13) Solve the system of equations, state the solution for b. $\begin{cases} -3a = 36 \\ 10a + 3c = 9 \\ 2b + 5c = 23 \end{cases}$ A) 96 B) 43 C) -12 D) -96

For #14 – 19, graph each quadratic. Label the vertex, axis of symmetry, and x-intercepts. State the domain and range in interval notation.

14) $y = (x + 2)(x - 4)$ 15) $y = (x + 4)(x + 3)$ 16) $y = (x + 4)(x + 2)$

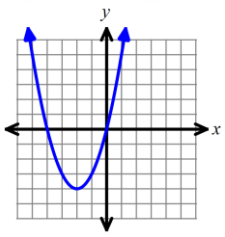
17) $y = -(x - 3)(x + 1)$ 18) $y = 3(x - 1)(x - 4)$ 19) $y = -3x(x + 7)$



20) Translate the graph up 2 and left 6 . What is the function for the graph obtained after the translation?

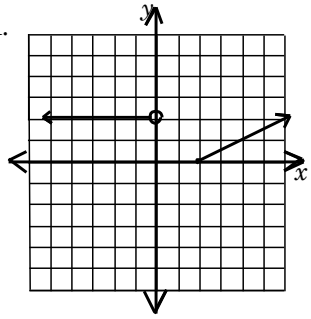
A. $f(x) = |x - 2|$
B. $f(x) = |x| - 2$
C. $f(x) = |x + 2|$
D. $f(x) = |x| + 2$

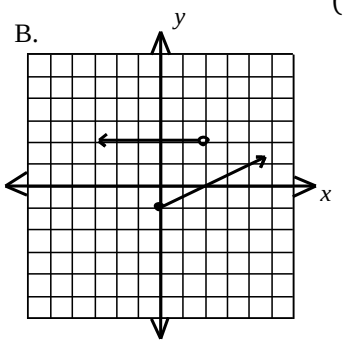
21) Compare the two functions represented below. Determine which of the following statements is true.

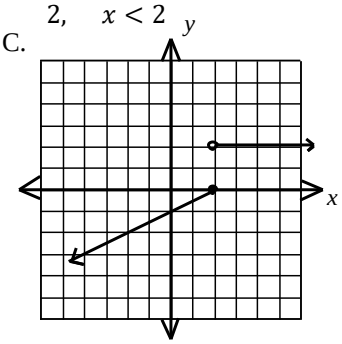
Function $f(x)$	Function $g(x)$
	$g(x) = (x - 6)^2 - 4$

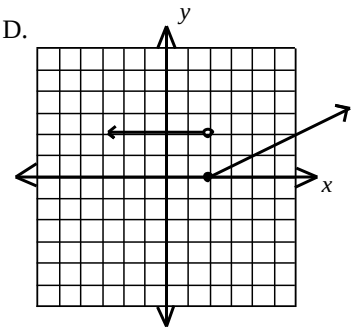
A. The functions have the same vertex.
B. The minimum value of $f(x)$ is the same as the minimum value of $g(x)$.
C. The functions have the same axis of symmetry.
D. The minimum value of $f(x)$ is less than the minimum value of $g(x)$.

22) What graph represents the piecewise function? $f(x) = \begin{cases} \frac{1}{2}x - 1, & x \geq 2 \\ 2, & x < 2 \end{cases}$

A.


B.


C.


D.


23) Graph $y > -2x^2 + 3$ 24) Graph $y \leq \frac{1}{3}(x + 5)^2$

3.4 Practice Problems

For # 1 – 8, write the quadratic function in vertex form. Then identify the vertex.

1) $y = x^2 + 14x + 11$ 2) $y = x^2 - 8x + 10$ 3) $f(x) = 2x^2 + 4x - 5$ 4) $y = 3x^2 - 9x + 18$

5) $y = x^2 + 12x + 6$ 6) $f(x) = x^2 - 4x + 15$ 7) $y = -2x^2 + 6x - 3$ 8) $y = -4x^2 - 8x - 3$

For #9- 12, graph each quadratic function. Identify the vertex, axis of symmetry, *y*-intercept, and *x*-intercepts, if any, and state the domain and range in interval notation.

9) $y = x^2 + 2x - 3$ 10) $y = x^2 - 6x + 5$ 11) $y = 2x^2 + 8x + 3$ 12) $y = -2x^2 + 4x + 3$

13) Given the function, $f(x) = x^2 + 2x + 7$, state whether the parabola opens up or down and the maximum or minimum value.

A. Up, Maximum value = 7 B. Up, Minimum value = 6
C. Down, Minimum value = 7 D. Down, Maximum value = 6

For #14-16, state the value of *k* when each function is written in vertex form $f(x) = a(x-h)^2 + k$.

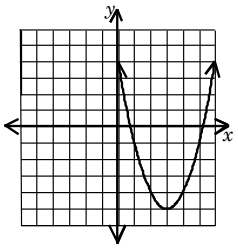
14) $y = x^2 + 3x - 4$ 15) $y = -2x^2 + 6x + 7$ 16) $y = 3x^2 - 12x - 2$

17) Simplify: $3i^{27}\sqrt{-6}\sqrt{2}$

18) Simplify: $(3 - 7i)^2$

A. $-40 + 0i$ B. $-40 - 42i$ C. $58 + 0i$ D. $58 - 42i$

19) Which equation is represented by the graph?



A. $y = (x - 3)^2 - 5$
B. $y = 2(x - 3)^2 - 5$
C. $y = 2(x + 3)^2 - 5$
D. $y = -(x + 3)^2 - 5$

20) Given $f(x) = -0.1x^2 + 0.3x + 0.7$, state whether the parabola opens up or down and the maximum or minimum value.

3.5 Practice Problems

For #1 – 5, graph each function. Label the vertex, axis of symmetry and state the domain and range in interval notation.

1) $y = -4x^2 - 1$ 2) $f(x) = x^2 + 2x$ 3) $y = 2x^2 + 4x - 3$ 4) $y = 2x^2 - 5x + 3$ 5) $g(x) = -6x^2 - 4x + 1$

6) In a track and field event contest, a contestant had a throw in the shot put that can be modeled by $y = -0.02x(x - 55.4)$. How long was the throw, if x is the shot put's horizontal distance (in feet), and y is the vertical distance (in feet)? What was the maximum height of the shot put?

7) An amusement park has a bungee swing that customers can pay to ride. The path of the swing is modeled by $f(x) = 0.035(x + 5)(x - 240)$, where x is the horizontal distance from the start of the swing, and $f(x)$ is the vertical distance reached by the swing, both in feet. Find the horizontal length of the motion of the swing for one movement, and find the minimum height reached by the swing.

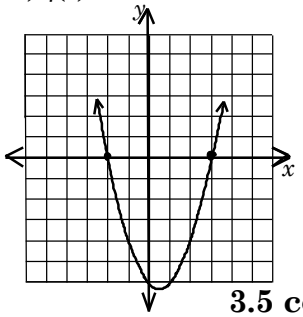
8) An soccer ball is kicked from the ground with an initial velocity of 32 feet per second. After how many seconds does the soccer ball hit the ground, and what is the maximum height reached?

9) A water balloon is launched upward from an initial height (h_0) of 15 feet with an initial velocity (v_0) of 50 feet per second. The height of the water balloon can be modeled by the equation $h = -16t^2 + v_0t + h_0$ where t is time in seconds and h is the height above the ground. Find the time it takes the water balloon to hit the ground level. (Round your answers to the nearest hundredth).

For #10 – 13, find the zeros (x-intercepts) of each quadratic function, if possible. Use exact answers (fractions, no decimals), and only include real solutions.

10) $y = 3x^2 + 2x$ 11) $y = 12x^2 + 8x - 15$ 12) $f(x) = 5x^2 - 25x + 30$ 13) $y = 4x^2 + 1$

14) Which function is represented by the graph to the right?



A. $f(x) = (x - 2)(x + 3)$
B. $f(x) = (x - 2)(x - 3)$
C. $f(x) = (x + 2)(x - 3)$
D. $f(x) = (x + 2)(x + 3)$

15) Graph $f(x) = x(x - 4)$ over the domain $[0, 3) \cup [4, 5)$

3.5 continued on the next page…

16) Compare the axis of symmetry and the minimum values for the two functions below.

$$h(x) = 2(x+3)(x-7)$$
$$j(x) = x^2 - 4x - 21$$

Determine which of the following statements is correct.

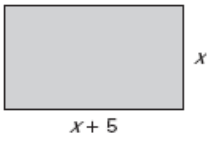
A. The functions $h(x)$ and $j(x)$ have the same axis of symmetry, but the minimum value of $h(x)$is less than the minimum value of $j(x)$.

B. The functions $h(x)$ and $j(x)$ have the same axis of symmetry, but the minimum value of $h(x)$is greater than the minimum value of $j(x)$.

C. The functions $h(x)$ and $j(x)$ do not have the same axis of symmetry, and the minimum value of $h(x)$is less than the minimum value of $j(x)$.

D. The functions $h(x)$ and $j(x)$ do not have the same axis of symmetry, and the minimum value of $h(x)$is greater than the minimum value of $j(x)$.

17) Find the perimeter of the rectangle shown if the area is 84 in^2.



18) Simplify: $(4-5i)(4+5i)$

A. -9 B. 41 C. $16+25i$ D. $16-25i$

Unit 3 Extra Practice (do all work on your own paper):

For #1 – 3: Graph each function. Include the vertex, *x*-intercepts, *y*-intercept, axis of symmetry, domain, range, and max/min.

1) $f(x) = -2(x-3)^2 + 32$ 2) $y = \frac{1}{2}(x-3)(x+1)$ 3) $y = x^2 - 11x + 28$

4. An object is launched from a 384 foot tall platform with an initial velocity of 32 feet per second. After how many seconds will the object reach its maximum height? What is the maximum height? When will it hit the ground?

5. Find the *x*-intercepts of the function, $y = 2x^2 - 4x + 10$. Give an exact answer.

6. Write the equation for a quadratic function with a vertex at (3, -2) passing through the point (1, 6). Write your answer in vertex form.

7. A hill on a roller coaster can be modeled by the equation $y = -3x^2 + 90x$, where *x* is the horizontal distance and *y* is the height, in yards. The hill starts and stops at the two zeros of the function. What is the horizontal distance between the start and stop of the hill?

8. Write the function in vertex form: $f(x) = 4x^2 - 12x + 5$.

9. Find the *x*-intercepts of the function: $y = 3x^2 + 11x - 20$.

10. A quadratic function has *x*-intercepts at 3 and -2 and passes through the point (0, 5). Write the function in standard form.

3.6 Practice

For #1 – 4, write a quadratic function in vertex form whose graph has the give vertex and passes through the given point.

1) vertex: (0, 0); point: (2, 4) 2) vertex: (–4, –2); point: (–3, –1) 3) vertex: (3, –2); point: (7, 6)
4) vertex: (4, –5); point: (1, 13)

For # 5 – 8, write a quadratic function in intercept form whose graph has the given *x*-intercepts and passes through the given point.

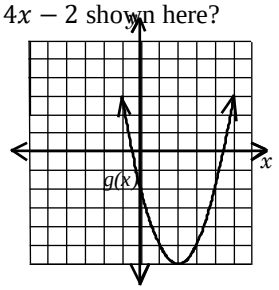
5) *x*-intercepts: 2, 3; point: (4, 2) 6) *x*-intercepts: 0, 4; point: (-1, 20) 7) *x*-int:–3,–2; point: (–4, –6)
8) *x*-intercepts: 4, 6; point: (5, –2)

9) Write the equation of the parabola opening upward with x-intercepts 0 and 4 and a compression factor of ½ in standard form, intercept form, and vertex form.

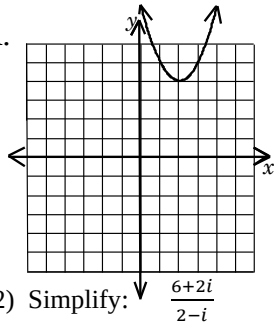
3.6 Practice Continued on next page….

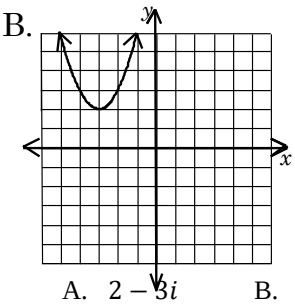
10) Which description explains how the graph of $f(x) = x^2 - 4x + 4$ is related to the graph of $g(x) = x^2 - 4x - 2$ shown here?

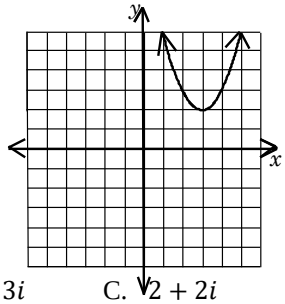
A. $f(x)$ is vertically stretched to make $g(x)$
B. $f(x)$ is translated down 6 units to make $g(x)$
C. $f(x)$ is translated 6 units to the left to make $g(x)$
D. $f(x)$ is compressed vertically to make $g(x)$

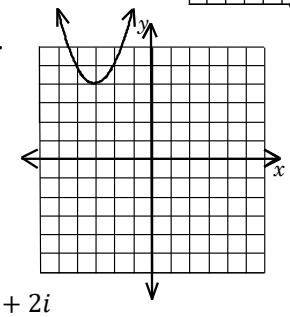


11) Translate $y = x^2 - 4x + 6$ five (5) units to the left. What is the graph obtained after the translation?

A. 

B. 

C. 

D. 

12) Simplify: $\frac{6+2i}{2-i}$ A. $2 - 3i$ B. $2 + 3i$ C. $2 + 2i$ D. $3 + 2i$

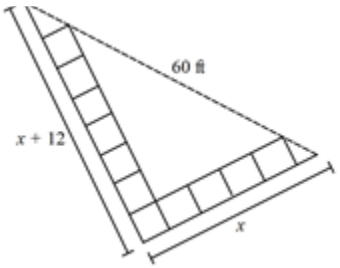
13) Which of following functions represent the parabola opening upwards with a compression factor of $\frac{1}{4}$ and *x*-intercepts $(-4, 0)$ and $(6, 0)$?

Option I: $y = \frac{1}{4}(x + 4)(x - 6)$ Option II: $y = \frac{1}{4}x^2 + \frac{5}{2}x - 6$

Option III: $y = 4(x - 4)^2 + 6$ Option IV: $y = \frac{1}{4}x^2 - \frac{1}{2}x - 6$

Option V: $y = \frac{1}{4}(x - 1)^2 - \frac{25}{4}$

14) Given the diagram below, approximate to the nearest foot how many feet of walking distance a person saves by cutting across the lawn instead of walking on the sidewalk.



A. 60 *feet* B. 48 *feet* C. 36 *feet* D. 24 *feet*

15) Which of the following is the quadratic equation for a parabola with a vertex of $(-8, 2)$ going through the point $(-13, 12)$?

A. $y = -\frac{10}{441}(x + 8)^2 + 2$ C. $y = \frac{2}{5}(x + 8)^2 + 2$

B. $y = -\frac{2}{5}(x - 8)^2 + 2$ D. $y = \frac{10}{441}(x - 8)^2 + 2$

16) A parabola has *x*-intercepts at -3 and 7and goes through the point $(-5, 6)$. What other point is on the parabola?

A. $(-8, 42)$ B. $(-1, 22)$ C. $(8, 44)$ D. $(11, 14)$

17) Write a system of equations that could be solved to write the quadratic function in standard form for the parabola passing through the points $(1, 4), (3, -2)$, and $(-2, 17)$?

Algebra 2 Honors Unit 3 Practice Packet 2022

Unit 3 Practice Test

For #1 – 6, graph each function. Find the vertex, axis of symmetry, *x*-intercepts (if any), and *y*-intercepts. State the domain and range in interval notation.

1) $g(x) = x^2 - 2x - 3$ 2) $y = 2(x + 3)^2 + 1$ 3) $y = 4(x + 2)(x + 4)$

4) $y = \frac{1}{3}(x - 3)^2 - 3$ 5) $f(x) = -2x^2 + 9x - 4$ 6) $h(x) = -x(x - 6)$

For #7 – 9, does the function have a maximum or a minimum? Then find that value.

7) $y = -(x - 4)^2 + 5$ 8) $y = 3x(x - 3)$ 9) $y = x^2 - 4x + 9$

10) A quadratic function has a vertex at (-2, -2), and passes through (7, -1). Write the equation for this quadratic in vertex form.

11) A object is launched from the top of a 110 foot building at an initial velocity of 32 feet per second. What is the maximum height reached by the object? After how many seconds will the object hit the ground? At what time does the object reach the maximum height?

12) A rectangle has a width of $x + 2$ and a length of $2x - 1$, with an area of 42 in^2. Find the perimeter of the rectangle.

13) A soccer ball lying on the ground is kicked into the air, and the path of its motion can be modeled by the equation $y = -0.52x(x - 34)$, where x is the horizontal distance in meters and y is the vertical distance in meters. What is the total horizontal distance travelled by the soccer ball when it hits the ground?

14) Find the values of h and k when the function, $y = -3x^2 + 12x - 7$, is written in vertex form, $y = a(x - h)^2 + k$.

15) Find the x-intercepts of the function $g(x) = 9x^2 - 13x + 4$.

16) Solve the equation: $3x^2 - 8x + 11 = 0$. If needed, leave your answers in radical form.

17) A quadratic has x-intercepts at -8 and 5, and passes through the point (7, -9). Write the equation of the quadratic in intercept form.

18) Patty's Frisbee throw can be modeled by $y = -0.02(x + 6)(x - 52.4)$. How long was the throw, if x is the Frisbee's horizontal distance (in feet), and y is the vertical distance (in feet)? What was the maximum height of the Frisbee?

19) Write the following quadratic in vertex form: $y = x^2 - 4x + 7$.

20) Write the following quadratic in vertex form: $y = -3x^2 + 6x - 5$.

21) Write the equation of the parabola opening downward with a compression factor of 1/2 and x-intercepts of -4 and 6 in standard form, intercept form and vertex form.

22) Write a system of equations that could be solved to write the quadratic function in standard form for the parabola passing through the points $(-1, 14)$, $(4, 29)$, and $(2, 5)$. Set up—do not solve.

23) Graph $f(x) = (x + 3)^2 + 1$ over the domain (-5, -3] ∪ (-2 , 0]

24) Graph y = - x(x + 6) over the domain [-7,-5) ∪ (-1, 2]

25) Graph $y > .25(x + 2)^2 + 3$

For #26-28, simplify the expression.

26) $(3i)(-i + 3)(2i - 4)$ 27) $(2i + 6)^2$ 28) $\frac{2\sqrt{5}}{3-\sqrt{5}}$

Algebra 2 Honors Unit 3 Practice Packet 2022

ANSWERS

3.1 Answers

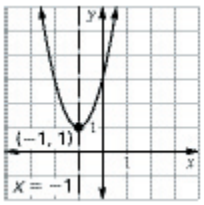
1) $(b + 8)(b - 5)$ 2) $(x + 4)(x - 4)$ 3) $(c + 4)^2$ 4) $(m + 4h^4)(m - 4h^4)$
5) $(k + 9i)(k - 9i)$ 6) $(2x + 3)(x + 1)$ 7) $(4g + 1)^2$ 8) $(2r + 5)(2r - 5)$
9) $2(4y + b)(4y - b)$ 10) $-3(2y - 3)^2$ 11) $x(2x - 1)(x - 3)$ 12) $4(x + 3)(x - 3)$
13)(x-3)(x+3)(x-3i)(x+3i)

14) 5, 6 15) -10, 8 16) -7, 5 17) 0, 7
18) ± 2 19) $-\frac{1}{2}, \frac{5}{3}$ 20) $\frac{5}{2}$ 21) $0, \frac{3}{2}$
22) $-\frac{1}{3}, 4$ 23) -2/3, -3/4 24) $-\frac{1}{3}$ 25) $3, -\frac{1}{2}$
26) $\pm\frac{5}{3}$

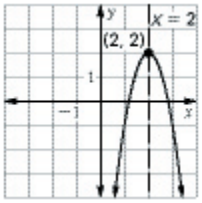
3.2 Answers

1) $-\frac{5 \pm \sqrt{33}}{2}$ 2) $\frac{3 \pm i\sqrt{7}}{4}$ 3) $\frac{-5 \pm \sqrt{41}}{2}$ 4) $\frac{1 \pm i}{2}$ 5) $-\frac{1}{2}, 3$
6) $6 \pm \sqrt{30}$ 7) $0.62 \pm 0.41i$ 8) $h = -16t^2 + 25t + 220$ 9) $h = -16t^2 + 220$
10) $h = -16t^2 - 15t + 220$ 11) 1st object: 4.57 sec; 2nd object: 3.71 sec; 3rd object: 3.27 sec
12) ± 18 13) $\pm\sqrt{19}$ 14) $\pm 3\sqrt{2}$ 15) –9, –1
16) $3 \pm 2\sqrt{2}$ 17) $-4 \pm 3\sqrt{2}$ 18) $x = 5$; dimensions 12 yd by 7 yd
19) 2 seconds 20) $24m$ 21) 30 yards 22) ½ foot (or 6 inches)

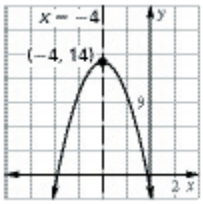
3.3 Answers

1) 

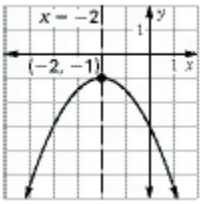
D: (-∞, +∞)
R: [1, +∞)

2) 

D: (-∞, +∞)
R: (-∞, 2]

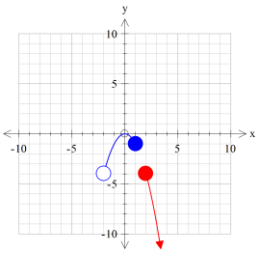
3) 

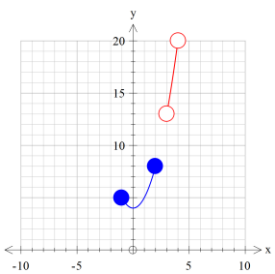
D: (-∞, +∞)
R: (-∞, 14]

4) 

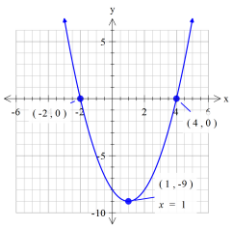
D: (-∞, +∞)
R: (-∞, -1]

5) 273 yds; 19.6 yds max height 6) A 7) C

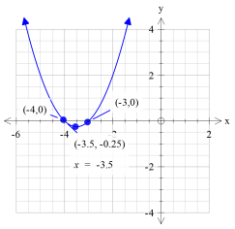
8) 

9) 

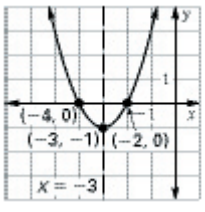
10) 110 yards 11) 1.5 12) B 13) D

14) 

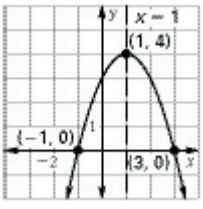
D: (-∞, +∞)
R: [-9, +∞)

15) 

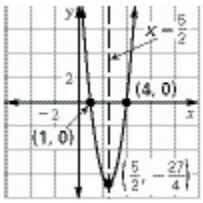
D: (-∞, +∞)
R: [-.25, +∞)

16) 

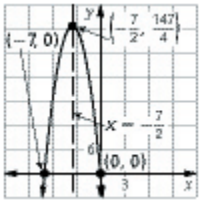
D: (-∞, +∞)
R: [-1, +∞)

17) 

D: (-∞, +∞)
R: (-∞, 4]

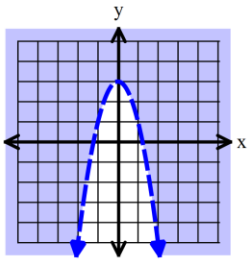
18) 

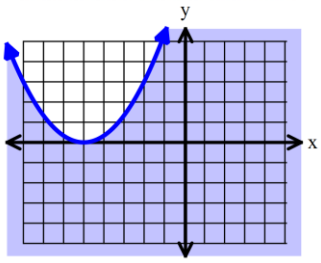
D: (-∞, +∞)
R: $[-\frac{27}{4}, +\infty)$

19) 

D: (-∞, +∞)
R: $(-\infty, \frac{147}{4}]$

20) C 21) B 22) D

23) 

24) 

3.4 Answers

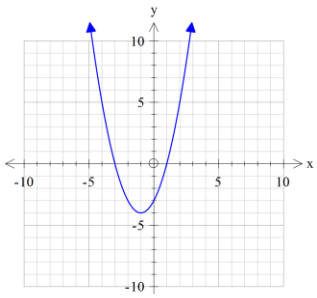
1) $y = (x + 7)^2 - 38$; (–7, –38) 2) $y = (x - 4)^2 - 6$; (4, –6) 3) $f(x) = 2(x + 1)^2 - 7$; (–1, –7)

4) $y = 3\left(x - \frac{3}{2}\right)^2 + \frac{45}{4}$; $\left(\frac{3}{2}, \frac{45}{4}\right)$ 5) $y = (x + 6)^2 - 30$; (–6, –30) 6) $f(x) = (x - 2)^2 + 11$; (2, 11)

7) $y = -2\left(x - \frac{3}{2}\right)^2 + \frac{3}{2}$; $\left(\frac{3}{2}, \frac{3}{2}\right)$ 8) $y = -4(x + 1)^2 + 1$; $(-1, 1)$

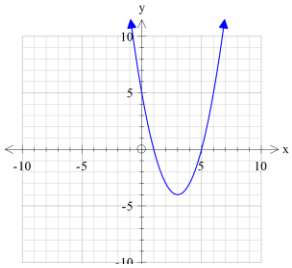
9)

Vertex: (-1, -4)
Axis: $x = -1$
y-int: (0, -3)
x-int: (-3,0) and (1, 0)



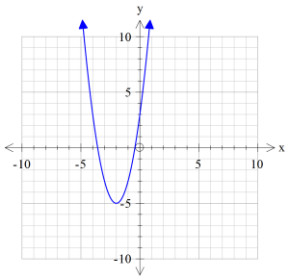
10)

Vertex: (3, -4)
Axis: $x = 3$
y-int: (0, 5)
x-int: (1,0) and (5, 0)



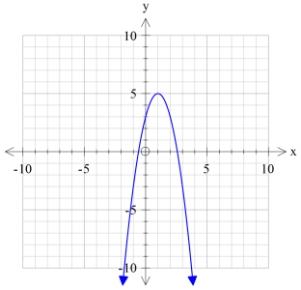
11)

Vertex (-2, -5)
Axis: $x = -2$
y-int: (0, 3)
x-int: (-0.4, 0) and (-3.6, 0)
D: $(-\infty, \infty)$
R: $\{-5, \infty)$



12)

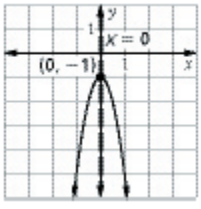
Vertex: (1, 5)
Axis: $x = 1$
y-int: (0, 3)
x-int: (-.6,0) and (2.6, 0)



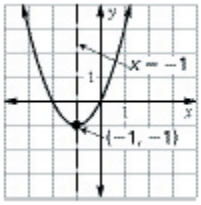
13) B 14) -25/4 15) 23/2 16) -14 17) $6\sqrt{3}$ 18) B 19) A

20) opens down, maximum value of $\frac{37}{40}$

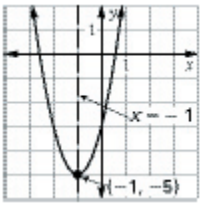
3.5 Answers

1) 

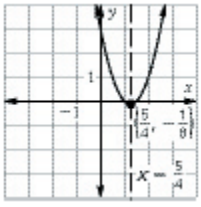
D: (-∞, +∞)
R: (-∞, -1]

2) 

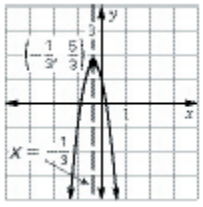
D: (-∞, +∞)
R: [-1, +∞)

3) 

D: (-∞, +∞)
R: [-5, +∞)

4) 

D: (-∞, +∞)
R: [-1/8, +∞)

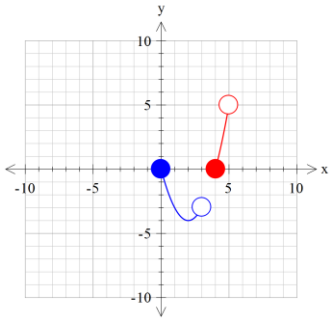
5) 

D: (-∞, +∞)
R: (-∞, 5/3]

6) length: 55.4 feet; max: 15.34 feet

7) length: 245 feet; min: -525.2 feet

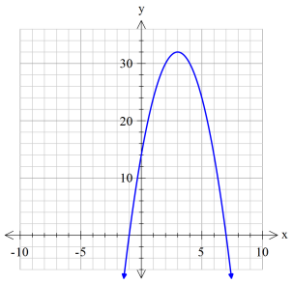
8) time: 2 seconds; max: 16 feet 9) t = 3.40 sec 10) $-\frac{2}{3}, 0$ 11) $-\frac{3}{2}, \frac{5}{6}$ 12) 2, 3

13) none 14) C 15) 

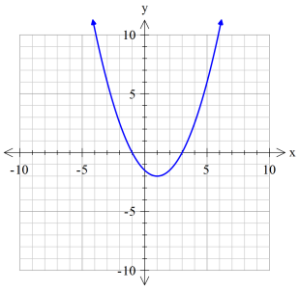
16) A 17) 38 inches 18) B

Unit 3 Extra Practice Answers:

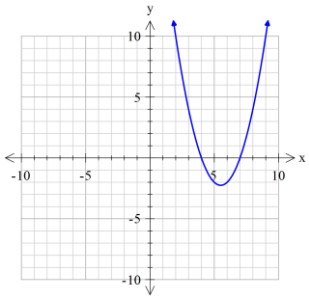
1. Vertex: (3, 32), x-int: (7, 0), (-1, 0)
y-int: (0, 14), AS: x = 3, D: All reals
range: $(-\infty, 32]$, max at 32



2. Vertex: (1, -2), x-int: (3, 0), (-1, 0)
y-int: (0, -1.5), AS: x = 1, D: All reals
range: $[-2, \infty)$, min at -2



3. Vertex: (5.5, -2.25), x-int: (7, 0), (4, 0)
y-int: (0, 28), AS: x = 5.5, D: All reals
range: $[-2.25, \infty)$, min at -2.25



4. at max after 1 second, max is 400 feet, hits ground after 6 seconds

5. $1 \pm 2i$

6. $y = 2(x-3)^2 - 2$

7. 30 yards

8. $f(x) = 4\left(x - \frac{3}{2}\right)^2 - 4$

9. $x = \frac{4}{3}, -5$

10. $y = -\frac{5}{6}x^2 + \frac{5}{6}x + 5$

3.6 Answers

1) $y = x^2$ 2) $y = (x + 4)^2 - 2$ 3) $y = ½ (x - 3)^2 - 2$ 4) $y = 2(x - 4)^2 - 5$ 5) $y = (x - 3)(x - 2)$

6) $y = 4x(x - 4)$ 7) $y = -3(x + 2)(x + 3)$ 8) $y = 2(x - 4)(x - 6)$

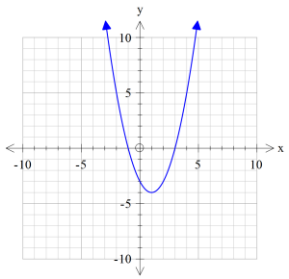
9) Standard Form: $y = \frac{1}{2}x^2 - 2x$; Intercept Form: $y = \frac{1}{2}x(x-4)$; Vertex Form: $y = \frac{1}{2}(x-2)^2 - 2$

10) B 11) B 12) C 13) A 14) D 15) C 16) D

17) $\begin{cases} a + b + c = 4 \\ 9a + 3b + c = -2 \\ 4a - 2b + c = 17 \end{cases}$

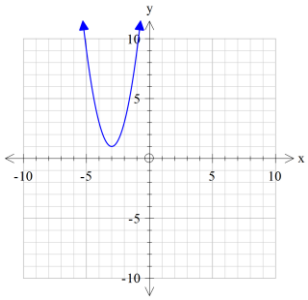
Unit 3 Practice Test Answers

1)



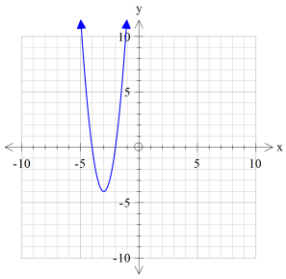
Vertex: (1, -4)
Axis of sym: $x = 1$
x-int at -1 and 3
y-int at -3
D: $(-\infty, +\infty)$
R: $[-4, +\infty)$

2)



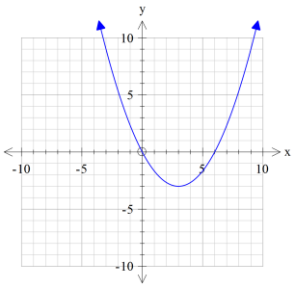
Vertex: (-3, 1)
Axis of sym: $x = -3$
x-int : none
y-int at 19
D: $(-\infty, +\infty)$
R: $[1, +\infty)$

3)



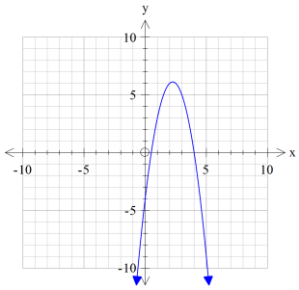
Vertex: (-3, -4)
Axis of sym: $x = -3$
x-int at -2 and -4
y-int at 32

4)



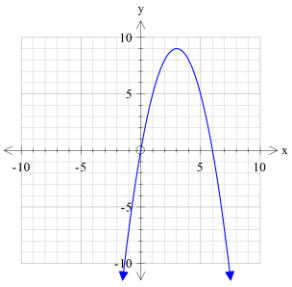
Vertex: (3, -3)
Axis of sym: $x = 3$
x-int at 0 and 6
y-int at 0

5)



Vertex: (9/4, 49/8)
Axis of sym: $x = 9/4$
x-int at 1/2 and 4
y-int at -4

6)



Vertex: (3, 9)
Axis of sym: $x = 3$
x-int at 0 and 6
y-int at 0

7) max at 5 8) min at –6.75 9) min at 5

10) $y = \frac{1}{81}(x+2)^2 - 2$ 11) max of 126 feet; after 3.8 seconds to ground; 1 sec to max 12) 26 inches 13) 34 m

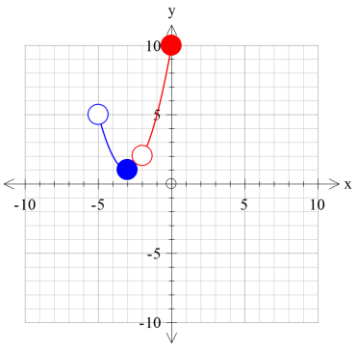
14) h = 2, k = 5 15) (1,0) and (4/9, 0) 16) $\frac{4 \pm i\sqrt{17}}{3}$ 17) $y = -\frac{3}{10}(x+8)(x-5)$

18) 52.4 ft and 17.1 feet 19) $y = (x-2)^2 + 3$ 20) $y = -3(x-1)^2 - 2$

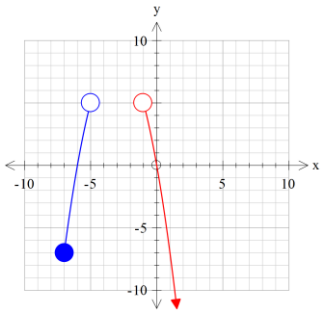
21) Standard form: $y = -\frac{1}{2}x^2 + x + 12$; Intercept form: $y = -\frac{1}{2}(x+4)(x-6)$; Vertex form: $y = -\frac{1}{2}(x-1)^2 + \frac{25}{2}$

22) $\begin{cases} 14 = a - b + c \\ 29 = 16a + 4b + c \\ 5 = 4a + 2b + c \end{cases}$

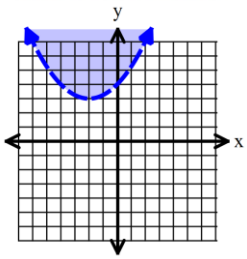
23)



24)



25)



26) $-30 - 30i$ 27) $32 + 24i$ 28) $\frac{3\sqrt{5}+5}{2}$