



- \_\_\_\_\_ 5. Identify the maximum or minimum value and the domain and range of the graph of the function  $y = 2(x + 2)^2 - 3$ .
- minimum value: 3  
domain: all real numbers  $\geq 3$   
range: all real numbers
  - maximum value:  $-3$   
domain: all real numbers  $\leq -3$   
range: all real numbers
  - maximum value: 3  
domain: all real numbers  
range: all real numbers  $\leq 3$
  - minimum value:  $-3$   
domain: all real numbers  
range: all real numbers  $\geq -3$
- \_\_\_\_\_ 6. Identify the vertex and the axis of symmetry of the graph of the function  $y = 2(x + 2)^2 - 4$ .
- vertex:  $(-2, 4)$ ;  
axis of symmetry:  $x = -2$
  - vertex:  $(2, -4)$ ;  
axis of symmetry:  $x = 2$
  - vertex:  $(-2, -4)$ ;  
axis of symmetry:  $x = -2$
  - vertex:  $(2, 4)$ ;  
axis of symmetry:  $x = 2$

**What are the vertex and the axis of symmetry of the equation?**

- \_\_\_\_\_ 7.  $y = -2x^2 + 8x - 20$
- |   |  |
|---|--|
| a. vertex: $(-2, 12)$<br>axis of symmetry: $y = -2$ | c. vertex: $(-2, -12)$<br>axis of symmetry: $x = -2$ |
| b. vertex: $(2, -12)$<br>axis of symmetry: $x = 2$  | d. vertex: $(2, -12)$<br>axis of symmetry: $x = -12$ |

**What is the expression in factored form?**

- \_\_\_\_\_ 8.  $x^2 - 6x + 8$
- |                     |                     |
|---------------------|---------------------|
| a. $(x + 4)(x + 2)$ | c. $(x - 4)(x + 2)$ |
| b. $(x - 2)(x - 4)$ | d. $(x - 2)(x + 4)$ |

**What is the expression in factored form?**

- \_\_\_\_\_ 9.  $9x^2 - 12x + 4$
- |                        |                 |
|------------------------|-----------------|
| a. $(-3x - 2)^2$       | c. $(3x - 2)^2$ |
| b. $(-3x + 2)(3x - 2)$ | d. $(3x + 2)^2$ |



What is the solution of each equation?

\_\_\_\_\_ 18.  $3x^2 = 21$

a.  $\sqrt{7}$

b.  $\sqrt{7}, -\sqrt{7}$

c.  $\frac{-\sqrt{21}}{3}, \frac{\sqrt{21}}{3}$

d.  $-\sqrt{7}, \sqrt{21}$

What value completes the square for the expression?

\_\_\_\_\_ 19.  $x^2 - 18x$

a. 9

b. -9

c. 81

d. -81

Use the Quadratic Formula to solve the equation.

\_\_\_\_\_ 20.  $-x^2 + 6x - 5 = 0$

a. -5, -1

b. 1, 5

c. -5, 11

d. 2, 10

\_\_\_\_\_ 21.  $2x^2 + x - 4 = 0$

a.  $-\frac{1}{2} \pm \frac{\sqrt{33}}{4}$

b.  $-4 \pm \frac{\sqrt{66}}{4}$

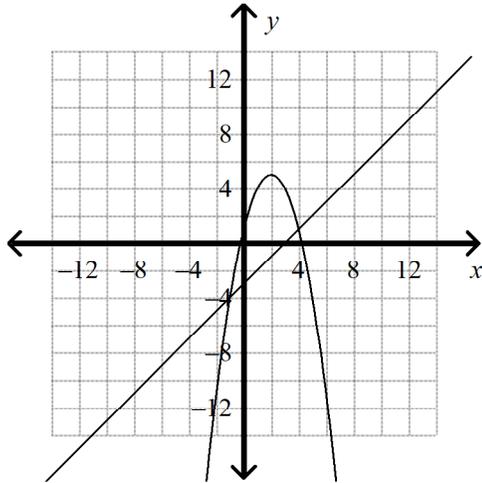
c.  $-\frac{1}{4} \pm \frac{\sqrt{33}}{4}$

d.  $-\frac{1}{2} \pm \frac{\sqrt{33}}{2}$

Use graphing to find the solutions to the system of equations.

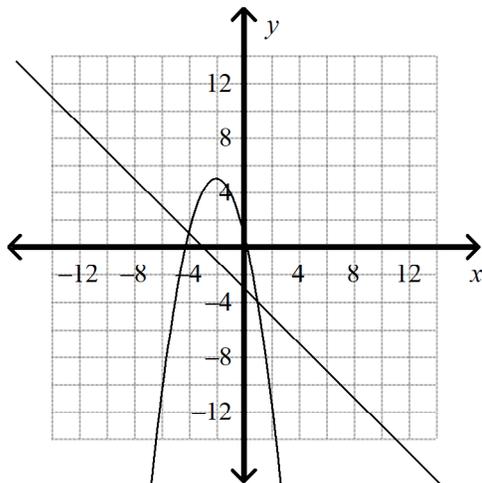
22. 
$$\begin{cases} y = -x^2 - 4x + 1 \\ y = -x - 3 \end{cases}$$

a.



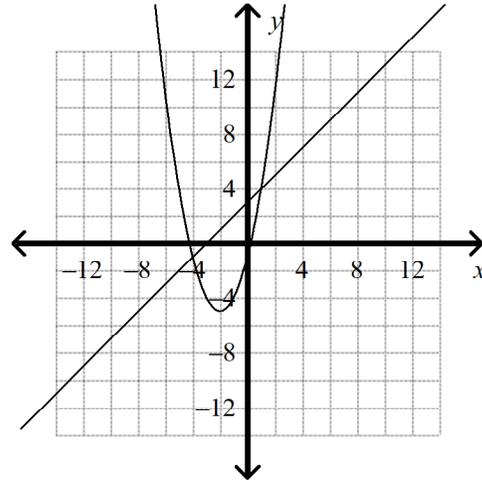
- (4, 1)
- (-1, -4)

b.



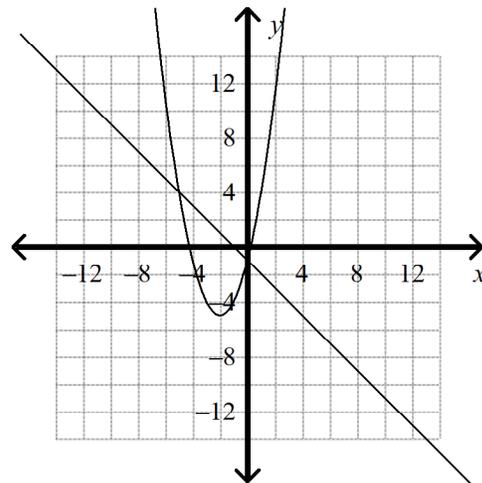
- (-4, 1)
- (1, -4)

c.



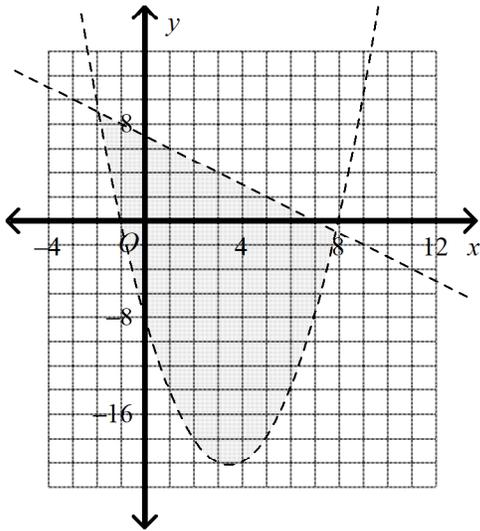
- (1, 4)
- (-4, -1)

d.



- (1, 4)
- (-4, -1)

\_\_\_\_ 23. Which system of inequalities is graphed below?



- a. 
$$\begin{cases} y > x^2 + 7x - 8 \\ y < x + 7 \end{cases}$$
- b. 
$$\begin{cases} y < x^2 + 7x - 8 \\ y > x + 7 \end{cases}$$
- c. 
$$\begin{cases} y > x^2 - 7x - 8 \\ y < -x + 7 \end{cases}$$
- d. 
$$\begin{cases} y < x^2 - 7x - 8 \\ y > -x + 7 \end{cases}$$

\_\_\_\_ 24. What is the solution of  $5x^2 + 6x - 23 = -6x - 9$ ? Use a linear-quadratic system and the intersection feature of a graphing calculator to solve.

- a.  $x \approx -4.00$  and  $x \approx 1.60$
- b.  $x \approx -1.67$  and  $x \approx 1.67$
- c.  $x \approx -3.26$  and  $x \approx 0.86$
- d.  $x \approx -0.86$  and  $x \approx 3.26$

## Alg 2 Topic 2 Practice Answer Section

1. ANS: C                   PTS: 1                   DIF: L2  
REF: 2-1 Vertex Form of a Quadratic Function  
OBJ: 2-1.1 Create quadratic functions in vertex form to represent relationships between variables as shown in their graphs.           NAT: HSA.CED.A.1| HSF.IF.B.4| HSF.IF.B.6| HSF.IF.C.7| HSF.BF.B.3  
TOP: 2-1 Example 4 Write an Equation of a Parabola Given the Graph  
KEY: parabola | equation of a parabola | vertex form
2. ANS: C                   PTS: 1                   DIF: L3  
REF: 2-1 Vertex Form of a Quadratic Function  
OBJ: 2-1.1 Create quadratic functions in vertex form to represent relationships between variables as shown in their graphs.           NAT: HSA.CED.A.1| HSF.IF.B.4| HSF.IF.B.6| HSF.IF.C.7| HSF.BF.B.3  
TOP: 2-1 Example 3 Write an Equation of a Parabola  
KEY: parabola | vertex form | quadratic function | equation
3. ANS: C                   PTS: 1                   DIF: L3  
REF: 2-1 Vertex Form of a Quadratic Function  
OBJ: 2-1.1 Create quadratic functions in vertex form to represent relationships between variables as shown in their graphs.           NAT: HSA.CED.A.1| HSF.IF.B.4| HSF.IF.B.6| HSF.IF.C.7| HSF.BF.B.3  
TOP: 2-1 Example 5 Write an Equation of a Transformed Function  
KEY: parabola | equation of a parabola | transformation
4. ANS: C                   PTS: 1                   DIF: L3  
REF: 2-1 Vertex Form of a Quadratic Function  
OBJ: 2-1.2 Graph functions on coordinate axes using their key features.  
NAT: HSA.CED.A.1| HSF.IF.B.4| HSF.IF.B.6| HSF.IF.C.7| HSF.BF.B.3  
TOP: 2-1 Example 1 Transform a Quadratic Function  
KEY: parabola | vertex of a parabola | y-intercept
5. ANS: D                   PTS: 1                   DIF: L3  
REF: 2-1 Vertex Form of a Quadratic Function  
OBJ: 2-1.3 Interpret key features of the graph of a quadratic function.  
NAT: HSA.CED.A.1| HSF.IF.B.4| HSF.IF.B.6| HSF.IF.C.7| HSF.BF.B.3  
TOP: 2-1 Example 2 Determine Key Features of a Quadratic Function  
KEY: parabola | vertex form | minimum value | maximum value
6. ANS: C                   PTS: 1                   DIF: L3  
REF: 2-1 Vertex Form of a Quadratic Function  
OBJ: 2-1.3 Interpret key features of the graph of a quadratic function.  
NAT: HSA.CED.A.1| HSF.IF.B.4| HSF.IF.B.6| HSF.IF.C.7| HSF.BF.B.3  
TOP: 2-1 Example 2 Determine Key Features of a Quadratic Function  
KEY: parabola | vertex form | vertex of a parabola | axis of symmetry
7. ANS: B                   PTS: 1                   DIF: L3  
REF: 2-2 Standard Form of a Quadratic Function  
OBJ: 2-2.2 Identify key features of quadratic functions and graph a quadratic function written in standard form.  
NAT: HSA.CED.A.2| HSF.IF.B.4| HSF.IF.B.6| HSF.IF.C.7| HSF.IF.C.8| HSF.IF.C.9| HSF.BF.A.1  
TOP: 2-2 Example 1 Find the Vertex of a Quadratic Function in Standard Form  
KEY: standard form | vertex of a parabola | axis of symmetry

8. ANS: B PTS: 1 DIF: L2  
 REF: 2-3 Factored Form of a Quadratic Function  
 OBJ: 2-3.1 Write a quadratic equation in factored form and use it to identify the zeros of the function it defines. NAT: HSA.SSE.A.2  
 TOP: 2-3 Example 1 Factor a Quadratic Expression KEY: factoring | quadratic expression
9. ANS: C PTS: 1 DIF: L3  
 REF: 2-3 Factored Form of a Quadratic Function  
 OBJ: 2-3.1 Write a quadratic equation in factored form and use it to identify the zeros of the function it defines. NAT: HSA.SSE.A.2  
 TOP: 2-3 Example 1 Factor a Quadratic Expression KEY: factoring | perfect square trinomial
10. ANS: C PTS: 1 DIF: L2  
 REF: 2-3 Factored Form of a Quadratic Function  
 OBJ: 2-3.1 Write a quadratic equation in factored form and use it to identify the zeros of the function it defines. NAT: HSA.SSE.A.2  
 TOP: 2-3 Example 1 Factor a Quadratic Expression KEY: difference of two squares | factoring
11. ANS: A PTS: 1 DIF: L3  
 REF: 2-3 Factored Form of a Quadratic Function  
 OBJ: 2-3.1 Write a quadratic equation in factored form and use it to identify the zeros of the function it defines. NAT: HSA.SSE.A.2  
 TOP: 2-3 Example 6 Write the Equation of a Parabola in Factored Form  
 KEY: factoring | factored form
12. ANS: C PTS: 1 DIF: L2  
 REF: 2-3 Factored Form of a Quadratic Function  
 OBJ: 2-3.2 Determine the intervals over which a quadratic function is positive or negative.  
 NAT: HSA.SSE.A.2 TOP: 2-3 Example 5 Determine Positive or Negative Intervals  
 KEY: intervals
13. ANS: A PTS: 1 DIF: L3  
 REF: 2-4 Complex Numbers and Operations  
 OBJ: 2-4.1 Add, subtract, and multiply complex numbers using the properties of operations and the relation  $i^2 = -1$ . NAT: HSN.CN.A.1| HSN.CN.A.2| HSN.CN.C.7| HSN.CN.C.8  
 TOP: 2-4 Example 2 Add and Subtract Complex Numbers KEY: complex number
14. ANS: B PTS: 1 DIF: L3  
 REF: 2-4 Complex Numbers and Operations  
 OBJ: 2-4.1 Add, subtract, and multiply complex numbers using the properties of operations and the relation  $i^2 = -1$ . NAT: HSN.CN.A.1| HSN.CN.A.2| HSN.CN.C.7| HSN.CN.C.8  
 TOP: 2-4 Example 3 Multiply Complex Numbers KEY: complex number
15. ANS: C PTS: 1 DIF: L2  
 REF: 2-4 Complex Numbers and Operations  
 OBJ: 2-4.1 Add, subtract, and multiply complex numbers using the properties of operations and the relation  $i^2 = -1$ . NAT: HSN.CN.A.1| HSN.CN.A.2| HSN.CN.C.7| HSN.CN.C.8  
 TOP: 2-4 Example 4 Simplify a Quotient with Complex Numbers  
 KEY: complex number | complex conjugates

16. ANS: C                   PTS: 1                   DIF: L2  
 REF: 2-4 Complex Numbers and Operations  
 OBJ: 2-4.2 Use complex numbers to represent numbers that are not on the real number line.  
 NAT: HSN.CN.A.1| HSN.CN.A.2| HSN.CN.C.7| HSN.CN.C.8  
 TOP: 2-4 Example 6 Solve a Quadratic Equation With Complex Solutions  
 KEY: complex conjugates
17. ANS: B                   PTS: 1                   DIF: L2  
 REF: 2-4 Complex Numbers and Operations  
 OBJ: 2-4.2 Use complex numbers to represent numbers that are not on the real number line.  
 NAT: HSN.CN.A.1| HSN.CN.A.2| HSN.CN.C.7| HSN.CN.C.8  
 TOP: 2-4 Example 1 Solve a Quadratic Equation Using Square Roots  
 KEY: imaginary number | imaginary unit
18. ANS: B                   PTS: 1                   DIF: L2                   REF: 2-5 Completing the Square  
 OBJ: 2-5.1 Transform a quadratic equation into the form  $(x - p)^2 = q$  by completing the square.  
 NAT: HSA.REI.B.4.b  
 TOP: 2-5 Example 1 Use Square Roots to Solve Quadratic Equations
19. ANS: C                   PTS: 1                   DIF: L2                   REF: 2-5 Completing the Square  
 OBJ: 2-5.1 Transform a quadratic equation into the form  $(x - p)^2 = q$  by completing the square.  
 NAT: HSA.REI.B.4.b  
 TOP: 2-5 Example 2 Understand the Process of Completing the Square  
 KEY: completing the square
20. ANS: B                   PTS: 1                   DIF: L2                   REF: 2-6 The Quadratic Formula  
 OBJ: 2-6.1 Use the Quadratic Formula to solve quadratic equations that have complex solutions.  
 NAT: HSA.REI.B.4.b                   TOP: 2-6 Example 1 Solve Quadratic Equations  
 KEY: Quadratic Formula
21. ANS: C                   PTS: 1                   DIF: L3                   REF: 2-6 The Quadratic Formula  
 OBJ: 2-6.1 Use the Quadratic Formula to solve quadratic equations that have complex solutions.  
 NAT: HSA.REI.B.4.b                   TOP: 2-6 Example 1 Solve Quadratic Equations  
 KEY: Quadratic Formula
22. ANS: B                   PTS: 1                   DIF: L2                   REF: 2-7 Linear-Quadratic Systems  
 OBJ: 2-7.2 Solve a linear-quadratic system using graphing and explain why the points of intersection are the solutions.  
 NAT: HSA.CED.A.3| HSA.REI.C.7  
 TOP: 2-7 Example 1 Determine the Number of Solutions
23. ANS: C                   PTS: 1                   DIF: L3                   REF: 2-7 Linear-Quadratic Systems  
 OBJ: 2-7.2 Solve a linear-quadratic system using graphing and explain why the points of intersection are the solutions.  
 NAT: HSA.CED.A.3| HSA.REI.C.7  
 TOP: 2-7 Example 4 Solve a Linear-Quadratic System of Inequalities  
 KEY: linear-quadratic system of inequalities
24. ANS: C                   PTS: 1                   DIF: L3                   REF: 2-7 Linear-Quadratic Systems  
 OBJ: 2-7.2 Solve a linear-quadratic system using graphing and explain why the points of intersection are the solutions.  
 NAT: HSA.CED.A.3| HSA.REI.C.7  
 TOP: 2-7 Example 5 Using a System to Solve an Equation  
 KEY: linear-quadratic system | graphing calculator | intersection