Name: _____

11.7.D2 – TRANSFORMATIONS OF QUADRATIC FUNCTIONS

Past due on: _____ Period: _____

Use a graphing calculator to determine the vertex AND zeros of each quadratic function. Then rewrite the function in vertex form AND factored form. *Refer to the 11.6 example "Writing an Equation of a Parabola Given Information about its Graph" in the Chapter 11 Summary.*

1. $f(x) = 3x^2 - 18x + 24$
   - VERTEX:
   - VERTEX FORM:
   - ZEROS:
   - FACTORED FORM:

2. $f(x) = -x^2 - 8x - 12$
   - VERTEX:
   - VERTEX FORM:
   - ZEROS:
   - FACTORED FORM:

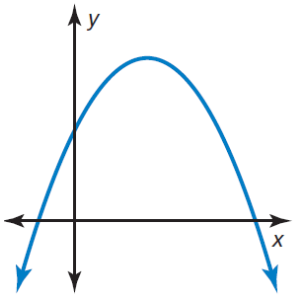
3. Which function could be represented by the graph? Explain your reasoning.

   a. $y = -(x + 1)(x - 5)$

   b. $y = 3(x + 1)(x - 5)$

   c. $y = \frac{1}{2}(x - 1)(x - 5)$

   d. $y = -2(x + 1)(x + 5)$



Match the function with its graph. Explain your reasoning. *Refer to ALL of the 11.7 examples in the Chapter 11 Summary.*

4. $g(x) = 2(x - 1)^2 - 2$

5. $g(x) = \frac{1}{2}(x + 1)^2 - 2$

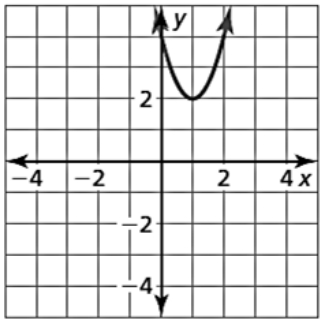
6. $g(x) = -2(x - 1)^2 + 2$

7. $g(x) = 2(x + 1)^2 + 2$

8. $g(x) = -2(x + 1)^2 - 2$

9. $g(x) = 2(x - 1)^2 + 2$

a.



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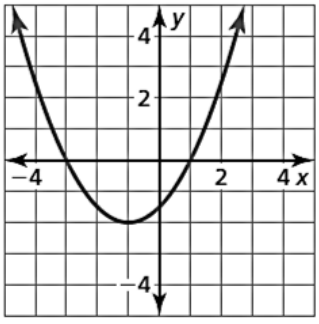

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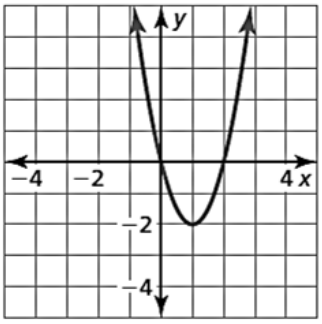

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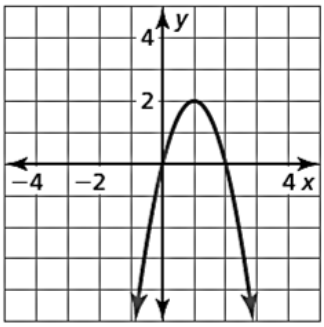
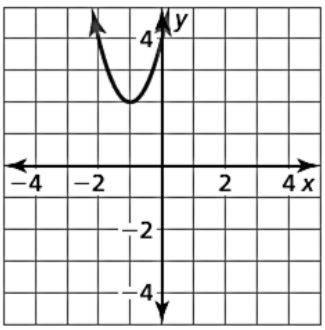


e.



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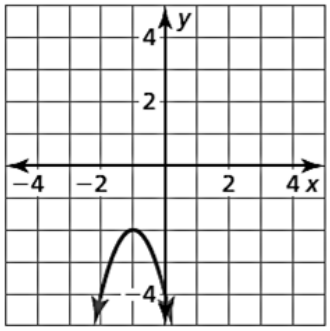


Determine the direction of opening, the x-intercepts, and the vertex of each quadratic function. *Refer to the 11.4 example "Determining x-Intercepts from Functions in Factored Form" AND the 11.5 example "Determining the Vertex of Quadratic Functions" in the Chapter 11 Summary.*

10. $y = 4(x - 3)(x + 5)$
    - DIRECTION OF OPENING
    - X-INTERCEPTS
    - VERTEX

11. $y = -1(x - 4)(x + 6)$
    - DIRECTION OF OPENING
    - X-INTERCEPTS
    - VERTEX

12. $y = 0.5(x - 6)(x + 4)$
    - DIRECTION OF OPENING
    - X-INTERCEPTS
    - VERTEX

13. $y = -2(x + 8)(x + 3)$
    - DIRECTION OF OPENING
    - X-INTERCEPTS
    - VERTEX

Describe the transformation(s) necessary to transform the graph of the function $f(x) = x^2$ into the graph of each function $f(x)$. *Refer to ALL of the 11.7 examples in the Chapter 11 Summary.*

14. $g(x) = x^2 + 7$

15. $g(x) = -x^2 - 4$

16. $g(x) = (x - 2)^2 + 8$

17. $g(x) = 4x^2 + 1$

18. $g(x) = \frac{2}{3}(x + 4)^2 - 9$

19. $g(x) = -(x - 6)^2 + 3$

Determine the axis of symmetry of each parabola. *Refer to the TWO 11.5 examples "Determining the Axis of Symmetry of Quadratic Functions" & "Determine the Axis of Symmetry Using Symmetric Points" in the Chapter 11 Summary.*

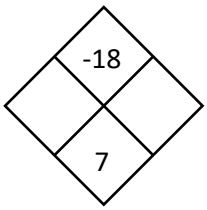
20. The x-intercepts of a parabola are $(4, 0)$ & $(12, 0)$.

21. Two symmetric points on a parabola are $(-3, 5)$ & $(7, 5)$.

22. Determine another point on the parabola that has an axis of symmetry of $x = 4$ if one point on the parabola is $(0, 2)$.

An X-box is a pattern for which the product of two numbers is placed on top, while the sum of the same two numbers is placed on the bottom. This pattern is demonstrated in the X-box below. Copy and complete each X-box pattern below.

23.



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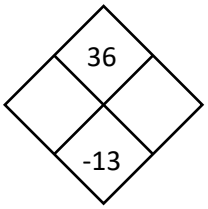

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