


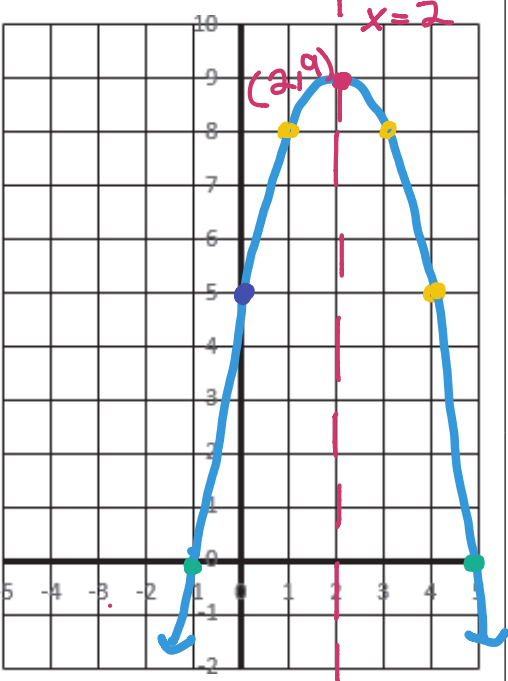


NAME: \_\_\_\_\_ PERIOD: \_\_\_\_\_ DATE: \_\_\_\_\_

# Homework Problem Set


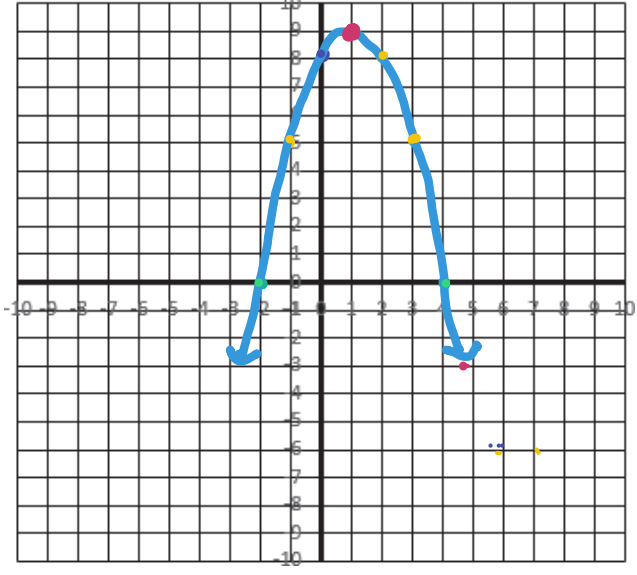


For each problem below, tell what information you can get from the form of the equation and then sketch a graph of the parabola.

1.

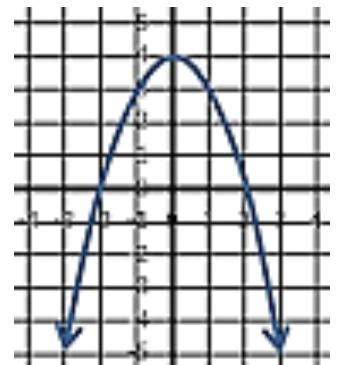
Form of the Equation	What can you easily find? Find it!	Sketch of the Parabola
Vertex: $y = x^2 - 16$	vertex $(0, -16)$ AOS: $x = 0$	
Standard: $y = x^2 - 16$	y-intercept $(0, -16)$	
Factored: $y = (x - 4)(x + 4)$	x-intercepts $x = 4, -4$	

Form of the Equation	What can you easily find? Find it!	Sketch of the Parabola
Vertex: $y = -(x - 2)^2 + 9$	Vertex $(2, 9)$  AOS: $x = 2$	
Standard: $y = -x^2 + 4x + 5$	y-intercept $(0, 5)$ 	
Factored: $y = -(x - 5)(x + 1)$	x-intercepts $x = 5, -1$ 	

3.

Form of the Equation	What can you easily find? Find it!	Sketch of the Parabola
Vertex: $y = -(x - 1)^2 + 9$	vertex (1, 9) A.O.S $x=1$ 	
Standard: $y = -x^2 + 2x + 8$	y-intercept (0, 8) 	
Factored: $y = -(x - 4)(x + 2)$	x-intercepts $x=4, -2$ 	

4. For the parabola graph at the right, determine the x-intercepts and vertex. Then write two equations using the information given.



x-intercepts: 2 and -2      Vertex: ( 0 , 4 )

Equations:  $y = -(x+2)(x-2)$        $y = -(x-0)^2 + 4$

5. Prove that the equations in Problem 4 are equivalent.

$$y = (x+2)(x-2)$$

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

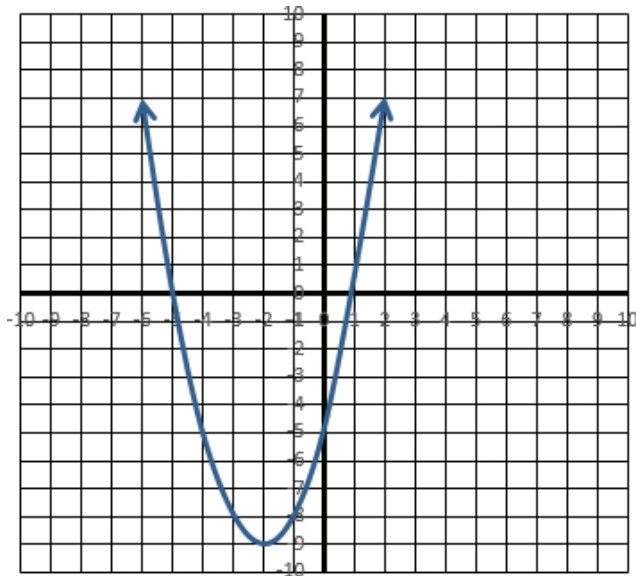
$$y = -x^2 + 4$$

$$y = -(x-0)^2 + 4$$

$$y = -(x-0)(x-0) + 4$$

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

6. For the parabola graph below, determine the x-intercepts and vertex. Then write two equations using the information given.



x-intercepts: -5 and 1

Vertex: (-2, -9)

Equations:  $y = (x+5)(x-1)$

$y = (x+2)^2 - 9$

7. Prove that the equations in Problem 6 are equivalent.

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

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

$$y = x^2 + 4x - 5$$

$$y = (x+2)^2 - 9$$

$$y = (x+2)(x+2) - 9$$

$$y = x^2 + 4x + 4 - 9$$

$$y = x^2 + 4x - 5$$

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## Spiral REVIEW—Multiplying Binomials

Multiply the following binomials. Write the answers in standard form, which in this case takes the form  $ax^2 + bx + c$ , where  $a$ ,  $b$ , and  $c$  are constants.

8.  $(x + 1)(x - 7)$

$x^2 - 6x - 7$

9.  $(x + 9)(x + 2)$

$x^2 + 11x + 18$

10.  $(x - 5)(x - 3)$

$x^2 - 8x + 15$

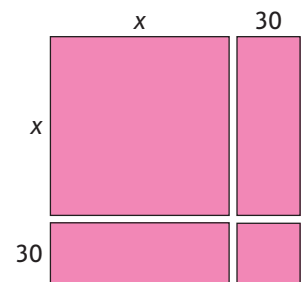
11.  $(x + 2)(x - 1)$

$x^2 + x - 2$

12. Describe any patterns you noticed in Problems 8–11.

- Coefficients for  $x^2$  are 1
- Constant term of resulting trinomial is product of two constants in binomial

13. The square parking lot at Gene Simon's Donut Palace is going to be enlarged so that there will be an additional 30 ft. of parking space in the front of the lot and an additional 30 ft. of parking space on the side of the lot, as shown in the figure below. Write an expression in terms of  $x$  that can be used to represent the area of the new parking lot. Explain how your solution is demonstrated in the area model.



$$\text{Area} = (x + 30)(x + 30)$$

$$\text{Area} = x^2 + 60x + 900$$

