



# Algebra 2

## Topic 4 // Graphing Quadratics B

N: Key

D:

P: 1 2 3 4 5 6

Standards: 10.0

Holt: 5-3 Graphing and Factoring p. 333

1) Answer the following questions for this quadratic:

$$y = x^2 + 6x - 7$$

- a) Does it open up or down? **up**
- b) Vertex  **$(-3, -16)$**
- c) Y-Intercept  **$(0, -7)$**
- d) X-Intercepts (or Roots or Zeroes)  **$x = -7; x = 1$**
- e) Axis of Symmetry  **$x = -3$**
- f) Graph

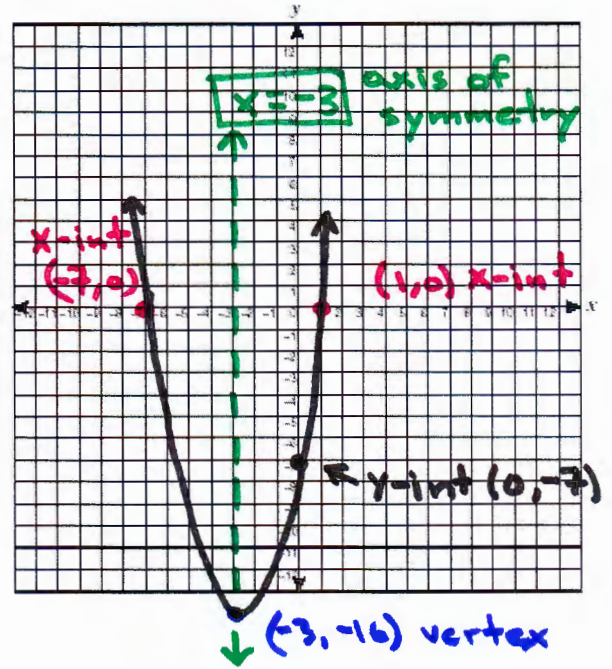
(b)  $x = \frac{-b}{2a} = \frac{-6}{2(1)} = \frac{-6}{2} = -3$

$y = (-3)^2 + 6(-3) - 7$   
 $= 9 - 18 - 7 = -16$

**$(-3, -16)$**

(c)  $x^2 + 6x - 7 = 0$

|  |  |   |
|--|--|---|
| $\begin{array}{r} x^2 + 6x - 7 \\ \underline{1 \quad \times \quad +7} \\ \phantom{x^2} + 7x - 7 \\ \phantom{x^2} \phantom{+ 7x} - 7 \\ \phantom{x^2} \phantom{+ 7x} \phantom{- 7} 0 \end{array}$ | $\begin{array}{r} x + 7 = 0 \\ \phantom{x} - 7 \\ \hline x = -7 \end{array}$ | $\begin{array}{r} x - 1 = 0 \\ \phantom{x} + 1 \\ \hline x = 1 \end{array}$ |
| <b><math>(x+7)(x-1) = 0</math></b>   | <b><math>x = -7</math></b>   | <b><math>x = 1</math></b>   |



2) Answer the following questions for this quadratic:

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

- a) Does it open up or down? **up**
- b) Vertex  **$(-1, -4)$**
- c) Y-Intercept  **$(0, -3)$**
- d) X-Intercepts (or Roots or Zeroes)  **$x = -3, x = 1$**
- e) Axis of Symmetry  **$x = -1$**
- f) Graph

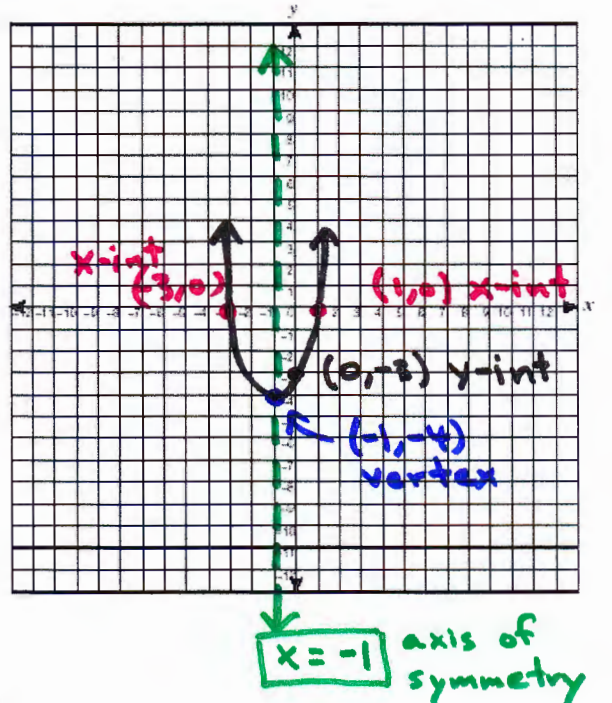
(b)  $x = \frac{-b}{2a} = \frac{-2}{2(1)} = \frac{-2}{2} = -1$

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

**$(-1, -4)$**

(d)  $x^2 + 2x - 3 = 0$

|   |  |   |
|---|--|---|
| $\begin{array}{r} x^2 + 2x - 3 \\ \underline{1 \quad \times \quad 3} \\ \phantom{x^2} + 3x - 3 \\ \phantom{x^2} \phantom{+ 3x} - 3 \\ \phantom{x^2} \phantom{+ 3x} \phantom{- 3} 0 \end{array}$ | $\begin{array}{r} x + 3 = 0 \\ \phantom{x} - 3 \\ \hline x = -3 \end{array}$ | $\begin{array}{r} x - 1 = 0 \\ \phantom{x} + 1 \\ \hline x = 1 \end{array}$ |
| <b><math>(x+3)(x-1) = 0</math></b>  | <b><math>x = -3</math></b>   | <b><math>x = 1</math></b>   |



3) Answer the following questions for this quadratic:  $\rightarrow a = -1 \quad b = 6 \quad c = -9$

$$y = -x^2 + 6x - 9$$

- a) Does it open up or down? **down**
- b) Vertex **(3, 0)**
- c) Y-Intercept **(0, -9)**
- d) X-Intercepts (or Roots or Zeroes) **x = 3**
- e) Axis of Symmetry **x = 3**
- f) Graph

(b)  $x = \frac{-b}{2a} = \frac{-6}{2(-1)} = \frac{-6}{-2} = 3$

$$y = -(3)^2 + 6(3) - 9 = -9 + 18 - 9 = 0$$

**(3, 0)**

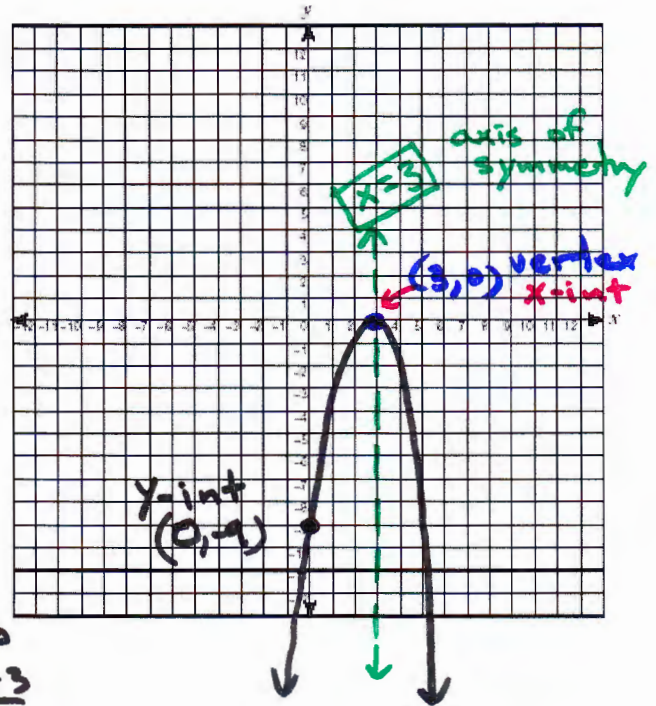
(d)  $-x^2 + 6x - 9 = 0$

$$\begin{array}{r} -1 \quad 3 \\ \times \quad \times \\ 1 \quad -3 \\ \hline (-x+3)(x-3) = 0 \end{array}$$

$-x+3=0 \quad x-3=0$

$$\begin{array}{r} -x+3=0 \\ -3 \quad -3 \\ \hline -x = -3 \\ -1 \quad -1 \\ \hline x = 3 \end{array}$$

**x = 3**



4) Answer the following questions for this quadratic:  $\rightarrow a = 1 \quad b = -8 \quad c = -9$

$$y = x^2 - 8x - 9$$

- a) Does it open up or down? **up**
- b) Vertex **(4, -25)**
- c) Y-Intercept **(0, -9)**
- d) X-Intercepts (or Roots or Zeroes) **x = 9, x = -1**
- e) Axis of Symmetry **x = 4**
- f) Graph

(b)  $x = \frac{-b}{2a} = \frac{-(-8)}{2(1)} = \frac{8}{2} = 4$

$$y = (4)^2 - 8(4) - 9 = 16 - 32 - 9 = -25$$

**(4, -25)**

(d)  $x^2 - 8x - 9 = 0$

$$\begin{array}{r} 1 \quad -9 \\ \times \quad \times \\ 1 \quad 1 \\ \hline (x-9)(x+1) = 0 \end{array}$$

$x-9=0 \quad x+1=0$

$$\begin{array}{r} x-9=0 \\ +9 \quad +9 \\ \hline x = 9 \end{array}$$

**x = 9**

$$\begin{array}{r} x+1=0 \\ -1 \quad -1 \\ \hline x = -1 \end{array}$$

**x = -1**

