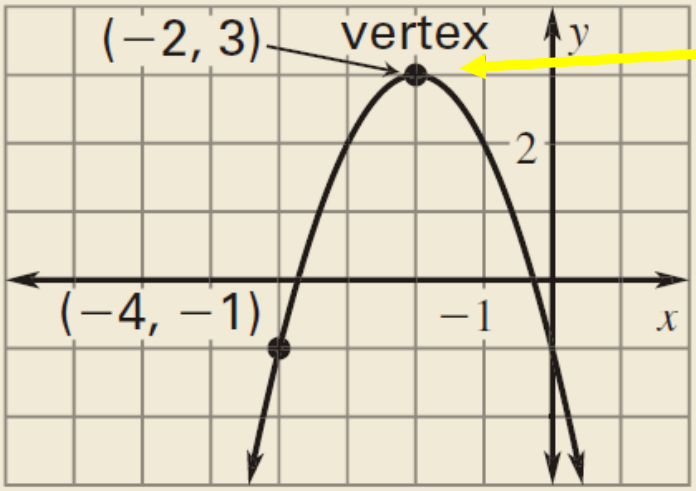
60-61 Writing Quadratic Functions

Write a quadratic function for the parabola shown.



Since the vertex is shown, use vertex form.

$y = a(x - h)^2 + k$

$y = a(x - -2)^2 + 3$

$y = a(x + 2)^2 + 3$

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

$-1 = a(-2)^2 + 3$

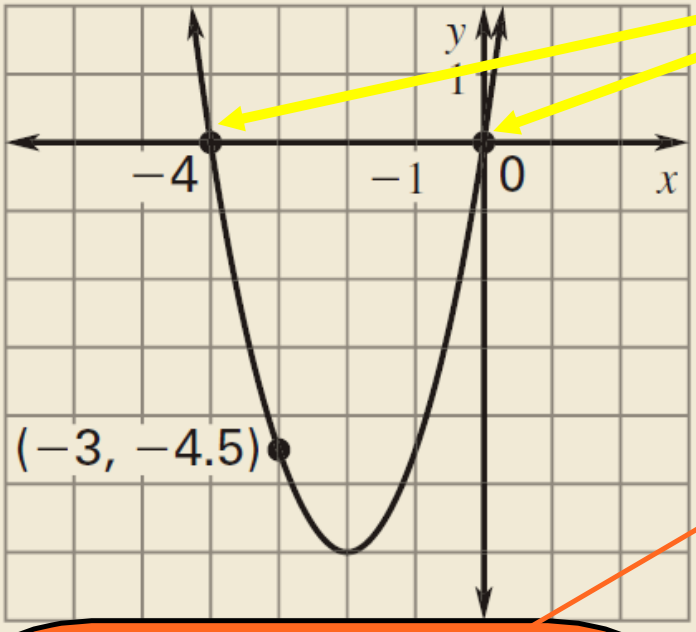
$-1 = 4a + 3$

$-4 = 4a$

$-1 = a$

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

Write a quadratic function for the parabola shown.



Since the intercepts are shown, use intercept form.

$y = a(x - p)(x - q)$

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

$y = a(x)(x + 4)$

$-4.5 = a(-3)(-3 + 4)$

$-4.5 = a(-3)(1)$

$-4.5 = -3a$

$1.5 = a$

$y = 1.5x(x + 4)$

Write a quadratic function in standard form for the parabola that passes through the points (-2 , 30) (1 , 6) and (4 , 36).

$y = ax^2 + bx + c$

$30 = a(-2)^2 + b(-2) + c$

$30 = 4a - 2b + c$

$y = ax^2 + bx + c$

$6 = a(1)^2 + b(1) + c$

$6 = a + b + c$

$y = ax^2 + bx + c$

$36 = a(4)^2 + b(4) + c$

$36 = 16a + 4b + c$

$30 = 4a - 2b + c$

$6 = a + b + c$

$36 = 16a + 4b + c$

$30 = 4a - 2b + c$

$6 = a + b + c$

$36 = 16a + 4b + c$

$$4a - 2b + c = 30$$
$$a + b + c = 6$$
$$16a + 4b + c = 36$$

$$\begin{bmatrix} 4 & -2 & 1 \\ 1 & 1 & 1 \\ 16 & 4 & 1 \end{bmatrix} \cdot \begin{bmatrix} a \\ b \\ c \end{bmatrix} = \begin{bmatrix} 30 \\ 6 \\ 36 \end{bmatrix}$$

$$A \cdot X = B$$

$$\cancel{A^{-1} \cdot A} \cdot X = A^{-1} \cdot B$$

$$X = A^{-1} \cdot B = \begin{bmatrix} 3 \\ -5 \\ 8 \end{bmatrix}$$

$$y = ax^2 + bx + c$$

$$y = 3x^2 - 5x + 8$$

"Quadratic Applications" worksheet due Tuesday, Dec 11

CHAPTER 4 TEST ON THURSDAY, DECEMBER 13