5.5 / 5.8 Writing Quadratic Functions

ex. 1

Write a quadratic function in vertex form

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

a) if $y = x^2 + 4x + 16$

$4 + y - 16 = x^2 + 4x + 4$

$y - 12 = (x+2)^2$

$y = (x+2)^2 + 12$

b) if $y = -2x^2 + 4x + 5$

$y - 5 = -2(x^2 - 2x + 1)$

$+2$

$y - 7 = -2(x-1)^2$

$y = -2(x-1)^2 + 7$

ex. 2

Write a quadratic function in intercept form $y = a(x - p)(x - q)$ if the x-intercepts are 2 and -2 and (-4, 8) is on the graph.

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

$8 = a(-4-2)(-4-(-2))$

$8 = a(-6)(-2)$

$\frac{8}{12} = a = \frac{2}{3}$

$y = \frac{2}{3}(x-2)(x+2)$

ex. 3

Write a quadratic function in standard form $y = ax^2 + bx + c$ that passes thru (-2, -1), (1, 11), and (2, 27).

x, y

$y = ax^2 + bx + c$

$y = 3x^2 + 7x + 1$

-1 ① $(-1 = 4a - 2b + c)$

② $11 = a + b + c$

③ $27 = 4a + 2b + c$

$+1$ ② $(4 = a + c)$

③ $13 = 4a + c$

$9 = 3a$ $\quad b = 7$

$3 = a$ $\quad c = 1$

(-1)

① $1 = -4a + 2b - c$

③ $27 = 4a + 2b + c$

$28 = 4b$