5.5 / 5.8 Writing Quadratic Functions

ex. 1 Write a quadratic function in vertex form $y = a(x - h)^2 + k$

use CTS

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

$y - 16 = x^2 + 4x + 4$
$+4$
$y - 12 = (x+2)^2$
$y = (x+2)^2 + 12$

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.

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

x y
$y = a(x-p)(x-q)$
$8 = a(-4-2)(-4-(-2))$
$8 = a(-6)(-2)$
$8 = 12a \quad a = \frac{2}{3}$

ex. 3 **Write a quadratic function in standard form $y = ax^2 + bx + c$ that passes thru (-2, -1), (1, 11), and (2, 27).**

$y = ax^2 + bx + c$

$(-2,-1)\ -1 = 4a - 2b + c$ (1)

$(1,11)\ -11 = -a + -b + -c$ (2)

$(2,27)\ 27 = 4a + 2b + c$ (3)

(1) (2) $-12 = 3a - 3b$ $\div 3$

(2) (3) $16 = 3a + b$

$-4 = a - b$

$12 = 4a$

$3 = a$

$7 = b$

$c = 1$

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