S-A2 Algebra 2 Session 17 8/1

-2^2 $(-2)^2 = (-2)(-2) = +4$

$-2^2 = -(2)^2 = -(2)(2) = -4$

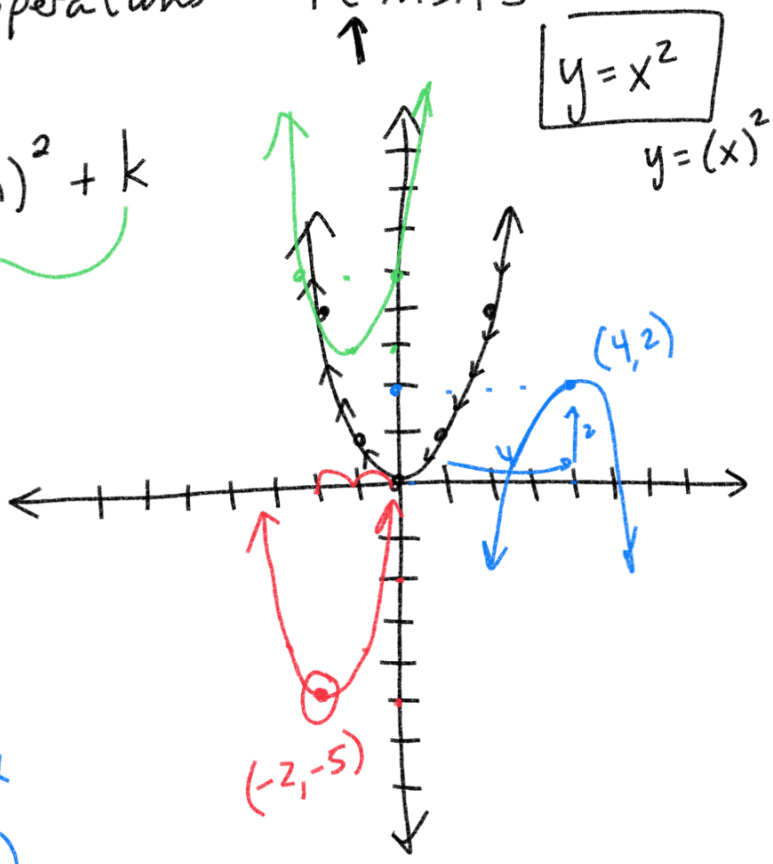
$(-1)(2)^2$ order of operations PEMDAS

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

vertex: (h, k)

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

opposite 2 Left — vertex $(-2,-5)$ — vertical down 5



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

flip down — 4 right — up 2 — vertex $(4,2)$

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

slope — 1 left — up 3 — vertex $(-1,3)$

Standard form

$y = ax^2 + bx + c$

$y = x^2 - 8x - 65$

$a = 1 \quad b = -8 \quad c = -65$

$y = x^2 - 8x - 65$

$y = (4)^2 - 8(4) - 65$

$16 - 32 - 65$

$-16 - 65 = -81$

standard form → vertex form

vertex (h, k)

$h = \frac{-b}{2a}$

also axis of symmetry

$\frac{-(-8)}{2(1)} = \frac{8}{2} =$

$h = \boxed{4}$

vertex (h, k)

$(4, -81)$

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

$\boxed{y = (x-4)^2 - 81}$

$y = x^2 - 12x - 45$

$ax^2 + bx + c$

$a = 1 \quad b = -12 \quad c = -45$

Standard form → vertex form

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

$h = \frac{-b}{2a}$

$h = \frac{-(-12)}{2(1)} = \frac{12}{2} = 6$

axis of symmetry

$x = 6$

$y = x^2 - 12x - 45$

$(6)^2 - 12(6) - 45$

$36 - 72 - 45$

$-36 - 45 = -81$

vertex: $(6, -81)$

(h, k)

vertex form

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

$y = (x-6)^2 - 81$

$y = x^2 + 4x$

standard form → vertex form

$a = 1 \quad b = 4 \quad c = 0$

$h = \frac{-b}{2a}$

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

h is axis of symmetry

vertex

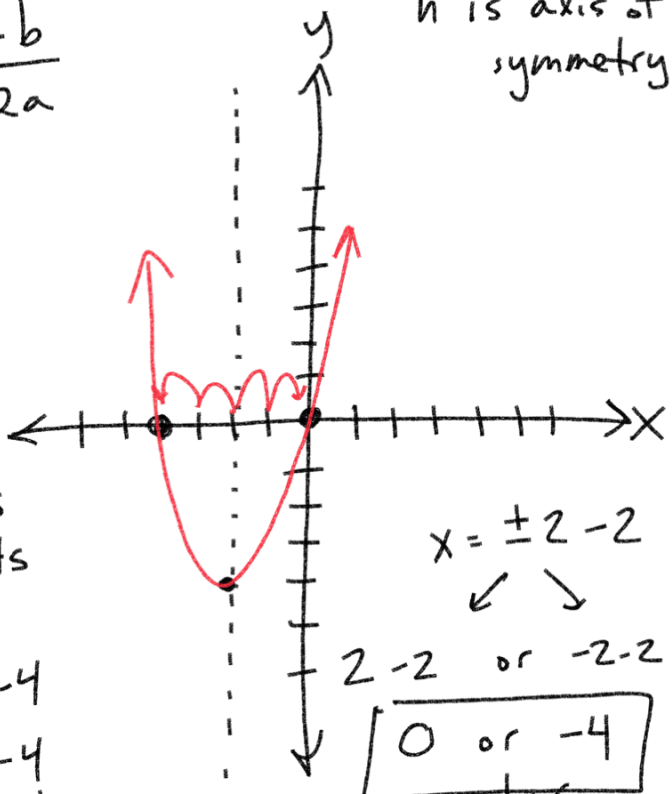
(h, k)

$(-2, -4)$

$x = -2$

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

$4 - 8 = -4$



Zeros/Roots

x-intercepts

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

$y = 0$

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

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

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

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

$+4 \qquad +4$

$\sqrt{4} = \sqrt{(x+2)^2}$

$\pm 2 = x + 2$

$-2 \quad -2$

$x = \pm 2 - 2$

$2 - 2 \quad \text{or} \quad -2 - 2$

$0 \text{ or } -4$

roots/zeros

Find the roots/zeros unFOILing

$y = x^2 + \square x - 6$

⊖ different signs
⊕ same signs

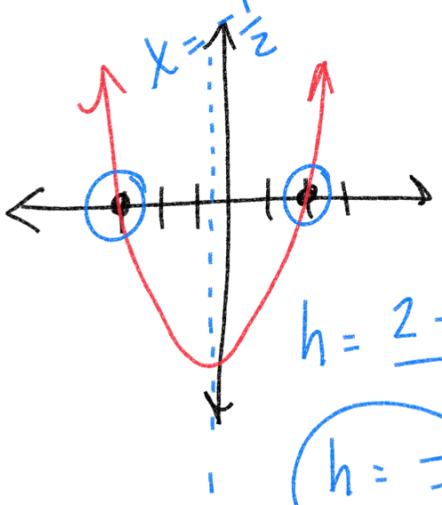
$y = 0$

$-2 + 3 = 1$

$-3 + 2 = -1$

$-2 * 3 = -6$

$y = x^2 + x - 6$ = $y = (x-2)(x+3)$



vertex?

h =

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

$h = \frac{-1}{2}$

$y = 0$

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

$x - 2 = 0$
$+2 \quad +2$
$x = 2$

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

$a = 1$

$y = x^2 - 2x - 24$

difference is 2

$-6 + 4 = -2$

$-6 * 4 = -24$

$y = (x-6)(x+4)$

$0 = (x-6)(x+4)$

$x - 6 = 0$
$+6 \quad +6$
$x = 6$

$x + 4 = 0$
$-4 \quad -4$
$x = -4$

axis of symmetry

$h = \frac{6+(-4)}{2}$

$\frac{2}{2} = 1$