# 8.4 Vertex Form

Standard Form: $y = ax^2 + bx + c$

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

opposite of #: x-coordinate of the vertex

y-coordinate of the vertex.

Ex1) $f(x) = -2(x-4)^2 + 5$

$a = -2$

vertex: (4, 5)

AOS: $x = 4$

y-int: plug in $x = 0$

$-2(0-4)^2 + 5$

$= -32 + 5 = -27$

y-int: (0, -27)

Domain: $\{x \mid x \in R\}$

Range: $\{y \mid y \leq 5\}$

Ex2) $f(x) = 2(x+4)^2 - 7$

opp  same

Vertex: $(-4, -7)$

AOS: $x = -4$

y-int: $2(0+4)^2 - 7 = 32 - 7 = 25$

$(0, 25)$

| x | y |
|---|---|
| -3 | $2(-3+4)^2 - 7 = -5$ |
| -2 | $2(-2+4)^2 - 7 = 1$ |