Quadratic Functions
$f(x) = ax^2 + bx + c$

Opens up if $a > 0$

Opens down if $a < 0$

The y-intercept is c so the point

(0 , c) is on the parabola.

Standard Form

Intercept Form

Vertex Form

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

Step 1: Find axis of symmetry A.O.S.

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

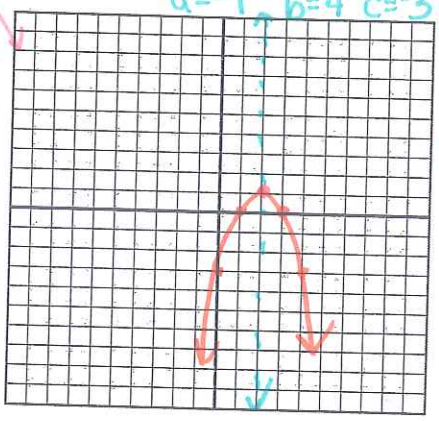
Step 2: Find vertex $\left(\frac{-b}{2a}, \text{plug in } x\right)$

∩ or ∪

Step 3: Make a table & graph

Graph $y = -x^2 + 4x - 3$.

$a=-1$ $b=4$ $c=-3$



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

$x = 2$

② $(2, 1)$

$-(2)^2 + 4(2) - 3$

x	0	1	2	3	4
y	-3	0	1	0	-3

Standard Form

Intercept Form

Vertex Form

Intercept Form: $y = a(x-p)(x-q)$

Step 1: Identify the x-int

$(p, 0)$ $(q, 0)$

Step 2: Find vertex

$x = \frac{p+q}{2}$ ($\frac{p+q}{2}$, plug in x)

Step 3: Draw parabola through vertex & x-int.

Graph $y = 2x^2 + 4x - 6$

Factor: $2(x^2+2x-3)$

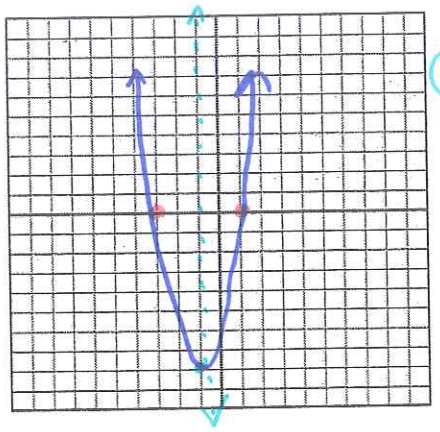
$2(x+3)(x-1)$

① $(-3, 0)$ $(1, 0)$

② $\frac{-3+1}{2} = -1$

$(-1, -8)$

A.O.S. $x = -1$



x					
y					

Intercept Form

Vertex Form

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

Step 1: Identify the constants

a: h: k:

Step 2: Identify the vertex

(h, k)

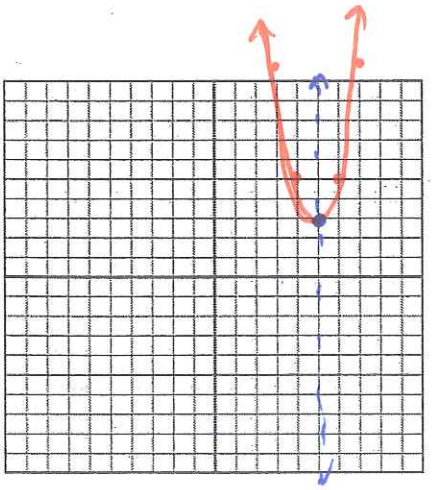
Step 3: Make a table

Step 4: Graph

Graph $y = 2(x-5)^2 + 3$

① a: 2 h: 5 k: 3

② (5, 3) A.O.S. x=5



x	3	4	5	6	7
y	11	5	3	5	11