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

Transformations:

if a is negative graph is flipped

If a is Greater than 1. Or less than -1, the graph is stretched.

If h is positive graph shifts to the left.

If k is positive graph shifts up.

if a is positive graph is not flipped

If a is a fraction between 1 and -1 the graph is squashed.

If h is negative graph shifts to the right.

If k is negative graph shifts down.

$y = -3(x+4)^2 - 8$

It if flipped.
It is stretched by a factor of 3.
It is shifted 4 to the left
It is shifted 8 down

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

1) Find the vertex: $(2, -4)$

2) Find the axis of symmetry: $x = 2$

3) Find the domain: $\{x \mid x \in \mathbb{R}\}$

4) Find the range: $\{y \mid y \geq -4, y \in \mathbb{R}\}$

5) Find the min/max: $y = -4$

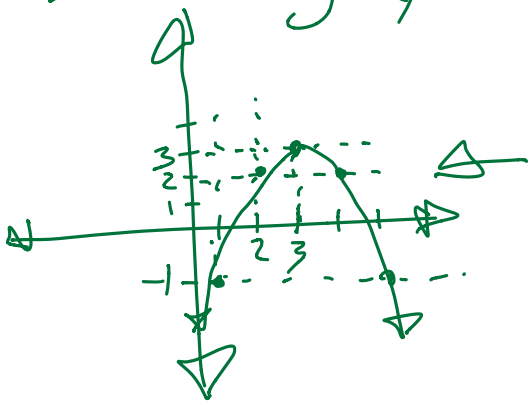
6) Graph it.

	x	y
+1	4	-2
+1	3	-3.5
	2	-4
-1	1	-3.5
-1	0	-2

$y = \frac{1}{2}((0)-2)^2 - 4$
$= 2 - 4$
$= -2$

$y = \frac{1}{2}((1)-2)^2 - 4$
$= \frac{1}{2}(1) - 4$
$= \frac{1}{2} - 4 = -3.5$

Use a vertex and a point on the graph to find a quadratic.



step 1: find the vertex

(3, 3)

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

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

$2 = a(2-3)^2 + 3$

$2 = a(-1)^2 + 3$

$2 = a(1) + 3$

$2 - 3 = a$

$a = -1$

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

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standard form = $y = ax^2 + bx + c$

$y = x^2 + 8x - 7$

complete the □

$y = (x^2 + 8x) - 7$

$y = (x^2 + 8x + 16) - 16 - 7$

$= (x+4)^2 - 23$

$\left(\frac{b}{2}\right)^2 = \left(\frac{8}{2}\right)^2 = 16$

$\pm\sqrt{16} = \pm 4$

$+4$

$y = 2x^2 + 16x - 7$

$= (2x^2 + 16x) - 7$

$= 2(x^2 + 8x) - 7$

$= 2(x^2 + 8x + 16 - 16) - 7$

$= 2[(x^2 + 8x + 16) - 16] - 7$

$= 2(x+4)^2 - 16(2) - 7$

$= 2(x+4)^2 - 39$

$\left(\frac{b}{2}\right)^2 = \left(\frac{8}{2}\right)^2 = 16$

Word problem

- throw ball
- lens/arc
- Revenue

Pg 157 #4

Pg 174 #5

Pg 193 # 3, 4, 6