Expand and find the pattern:

$(x+3)^2$

$(x+3)(x+3)$

$x^2+3x+3x+9$

x^2+6x+9

$(3x-2)^2$

$(3x-2)(3x-2)$

$9x^2-6x-6x+4$

$9x^2-12x+4$

6.2 Graphing Cubics & Quadratics

Objective: I can determine from a graph whether a function is a quadratic, a cubic, or neither.

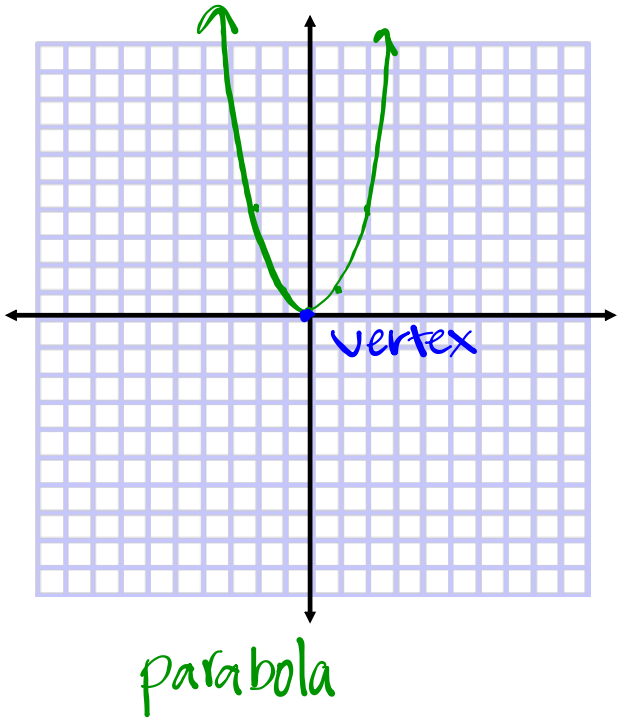
Objective: I can find the vertex of a quadratic function.

Objective: I can find the inflection point of a cubic function.

Objective: I can graph quadratic and cubic functions.

Objective: I can determine whether a graph is even, odd, or neither.

Quadratic



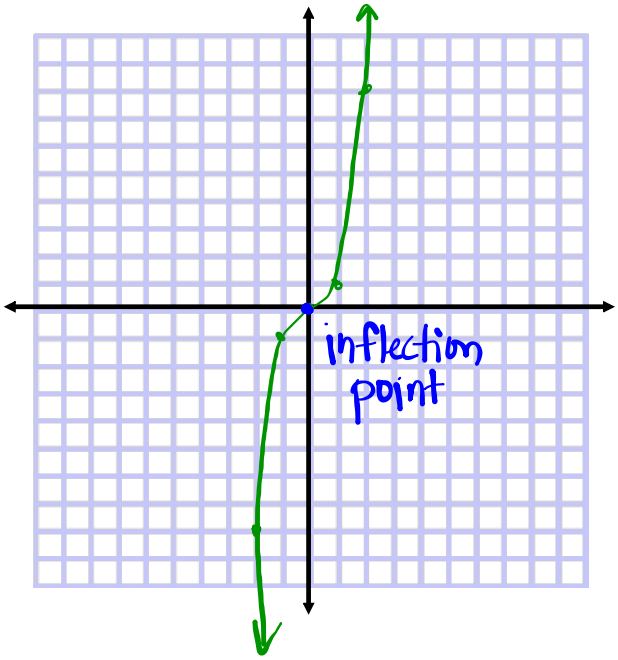
$$f(x) = x^2$$

X	Y
-2	4
-1	1
0	0
1	1
2	4

minimum

maximum

Cubic



$$f(x) = x^3$$

X	Y
-2	-8
-1	-1
0	0
1	1
2	8

no minimum

no maximum

Quadratic/cubic (cont.)

Graphing Form: $f(x) = a(x-h)^n + k$

(h, k) Quadratic: Vertex
Cubic: inflection point

What do you notice about the signs of (h,k)?

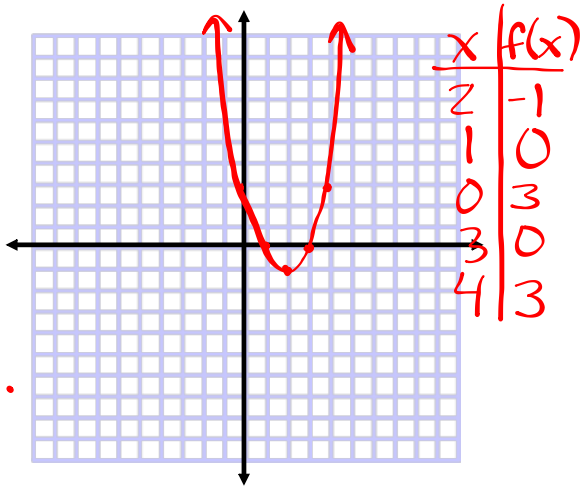
x's lie!

Find the vertex and graph.

$f(x) = (x-2)^2 - 1$

vertex: (2, -1)

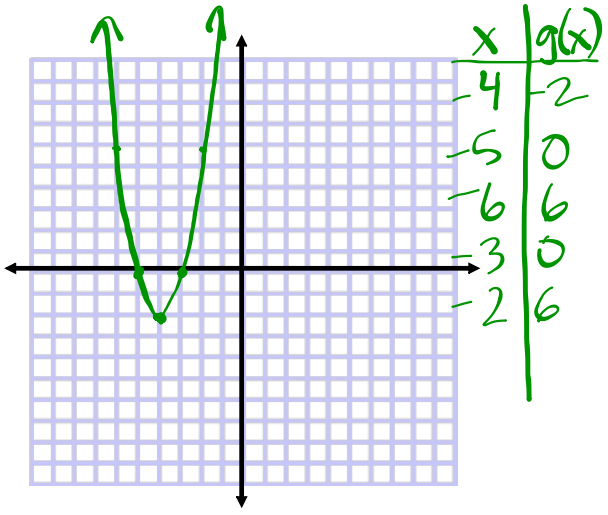
x	f(x)
2	-1
1	0
0	3
3	0
4	3



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

vertex: (-4, -2)

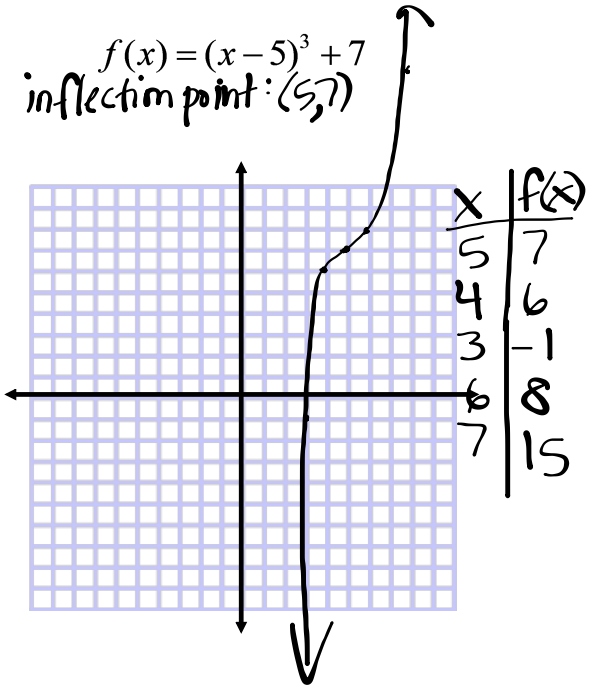
x	g(x)
-4	-2
-5	0
-6	6
-3	0
-2	6



Find the inflection point and graph:

$f(x) = (x-5)^3 + 7$

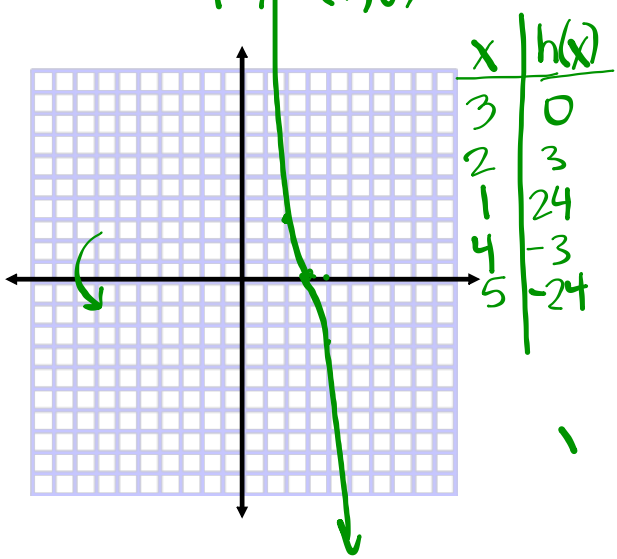
inflection point: (5,7)



x	f(x)
5	7
4	6
3	-1
6	8
7	15

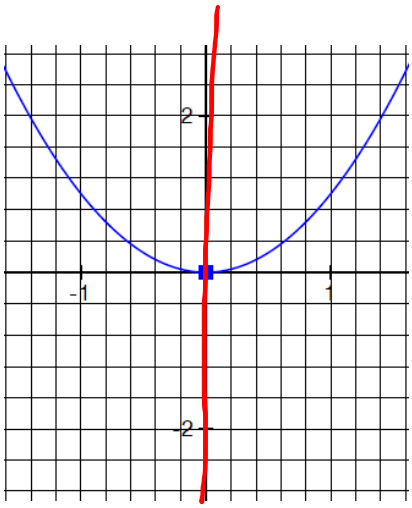
$h(x) = -3(x-3)^3 + 0$

inflection point: (3,0)

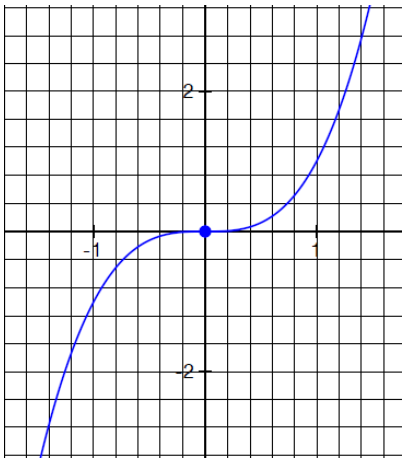


x	h(x)
3	0
2	3
1	24
4	-3
5	-24

Symmetry



Even: symmetric about y-axis



Odd: symmetric about origin

Even, Odd, or Neither?