Quiz 6-1:

1. $(7x^2 + 6x - 5) - (2x^2 - 3x - 4)$

$7x^2 + 6x - 5 - 2x^2 + 3x + 4$

$5x^2 + 9x - 1$

1pt   1pt   1pt

2. $(3x + 9)(4x - 2)$

$12x^2 - 6x + 36x - 18$

$12x^2 + 30x - 18$

3. $(5x - 2)^2$

$(5x-2)(5x-2)$

$25x^2 - 10x - 10x + 4$

$25x^2 - 20x + 4$

/9

6.2 Graphing Cubics & Quadratics X^2
X^3

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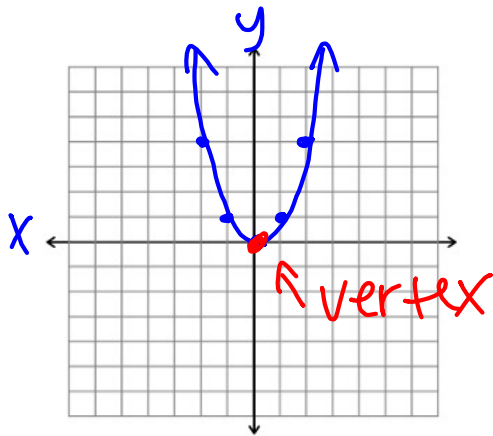
Objective: I can find the vertex of a quadratic function.

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

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

$$y = x^2 \qquad -2 \cdot -2$$

X	Y
(-2, | 4)	$y = (-2)^2$
-1	1	$y = (-1)^2$
0	0	$y = (0)^2$
1	1	$y = (1)^2$
2	4	$y = (2)^2$

vertex

vertex

Cubic

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

$$-2 \cdot -2 \cdot -2$$
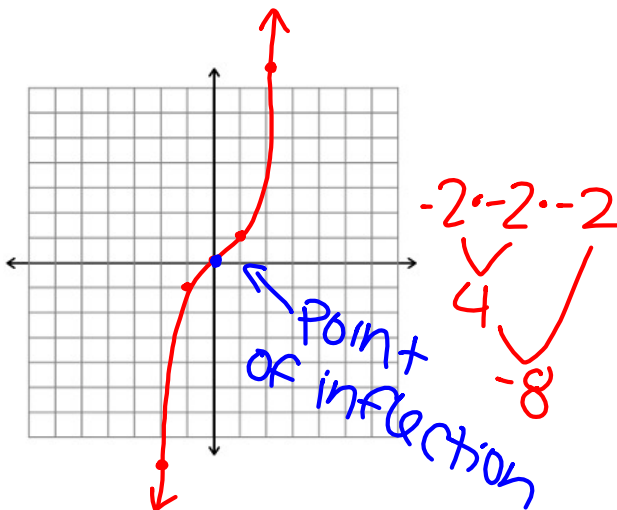
Point of inflection

X	Y
-2	-8	$y = (-2)^3$
-1	-1	$y = (-1)^3$
0	0	
1	1	$y = (1)^3$
2	8	$y = (2)^3$

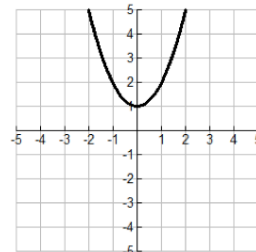inflection point

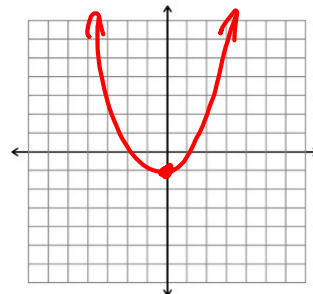# TASK! Look for patterns!
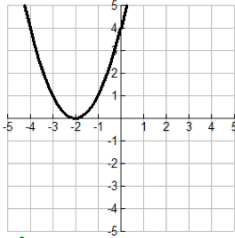
$f(x) = x^2 + 2$

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

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

↑ 2

↓ 2
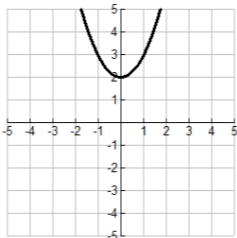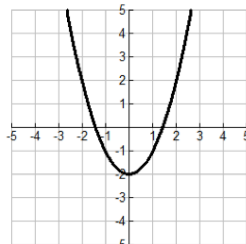
↑ 1

$f(x) = x^2 \pm \#$

up & down

f(x) = x² - 1

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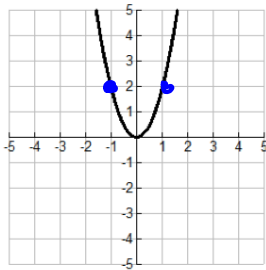
$f(x) = (x - 2)^2$

$f(x) = (x + 1)^2$
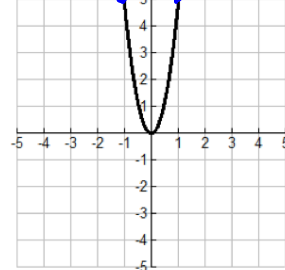
left 2
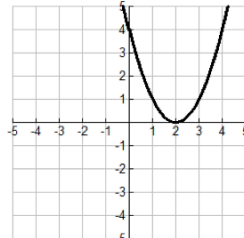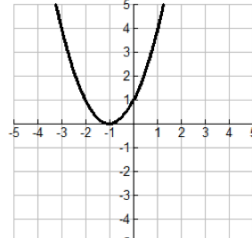
right 2

left 1

$$f(x) = (x \pm \#)^2$$
left to right
X's LIE!

f(x) = (x - 1)²
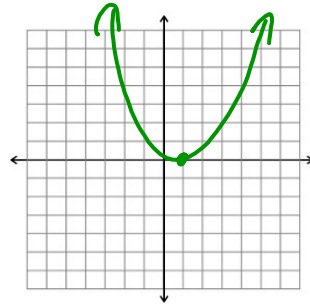
$f(x) = 2x^2$

$f(x) = 3x^2$

$f(x) = 5x^2$

$$f(x) = \# x^2$$
Slope

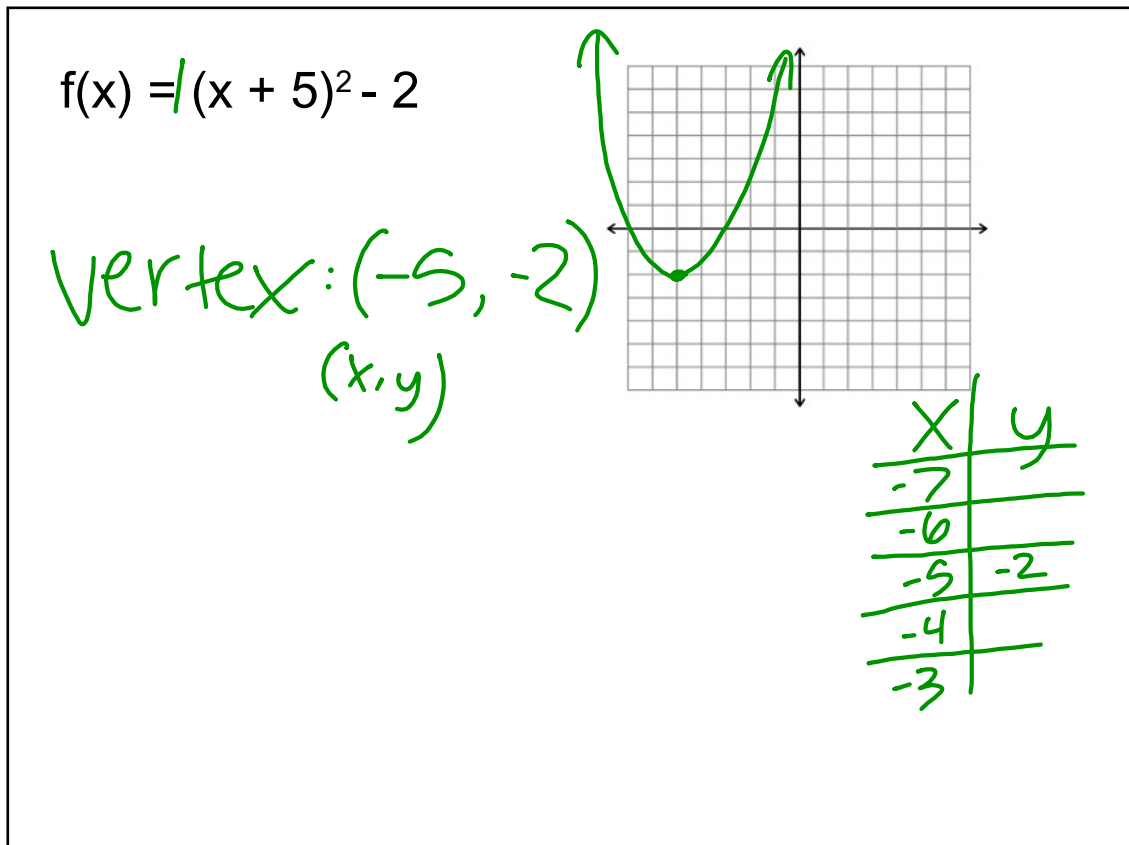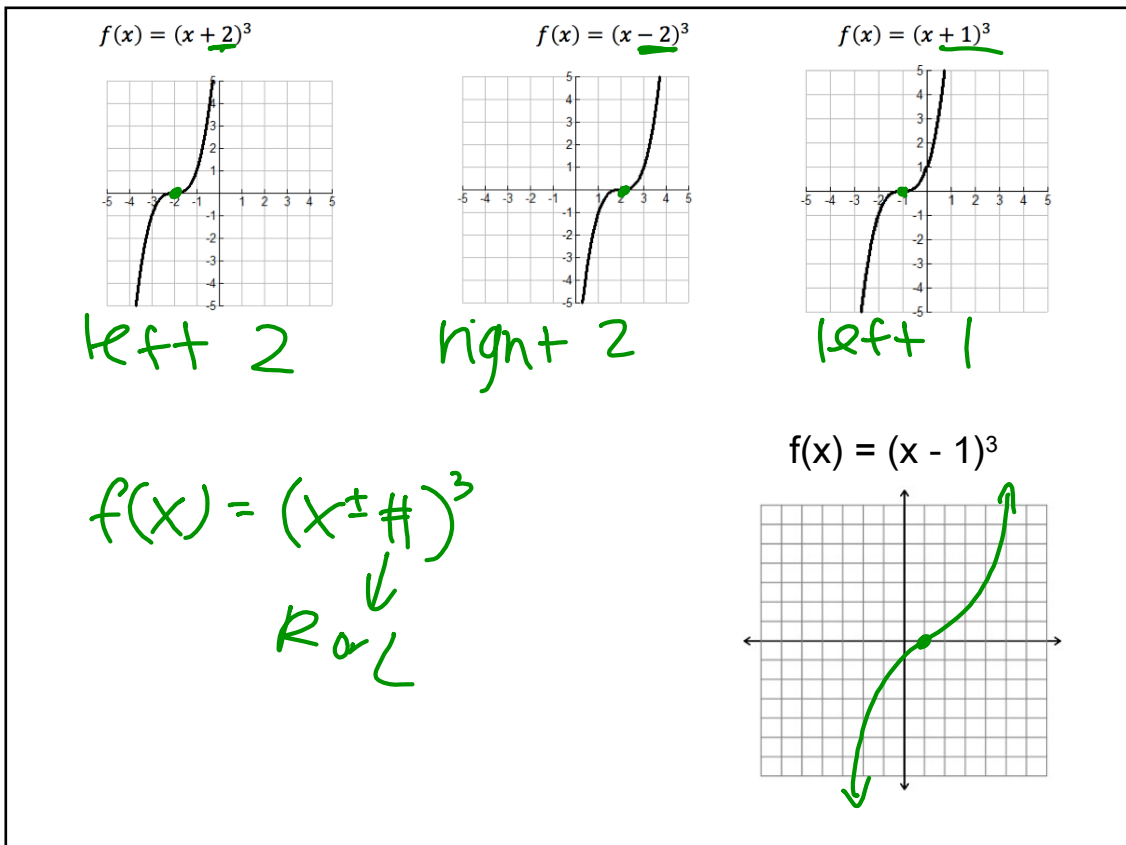(1, 7)   x = 1
7·1²
7·1 = 7

f(x) = 7x²

$f(x) = \underline{-2}x^2$

$f(x) = -3x^2$

$f(x) = -\#x^2$

$flips \leftarrow$
$down$

$f(x) = -5x^2$

$-5(1)^2$
$-5 \cdot 1 = -5$

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

$Vertex: (-5, -2)$

(x, y)

X	y
-7	
-6	
-5	-2
-4	
-3	

$f(x) = x^3 + 2$

$f(x) = x^3 - 2$

$f(x) = x^3 + 1$

Point of inflection

Inflection

up 2   **Point**

$f(x) = x^3 \pm \#$ **up or down**

f(x) = x³ - 1

$f(x) = (x + 2)^3$

$f(x) = (x - 2)^3$

$f(x) = (x + 1)^3$

left 2   **right 2**   **left 1**

$f(x) = (x \pm \#)^3$

R or L

f(x) = (x - 1)³

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

$f(x) = 7x^3$

$f(x) = \#X^3$
↓
Steepness

$7(-1)^3$
$7 \cdot -1 = -7$

$f(x) = -2x^3$ $f(x) = -3x^3$

$f(x) = -X^3$
↙
flip

$f(x) = -5x^3$
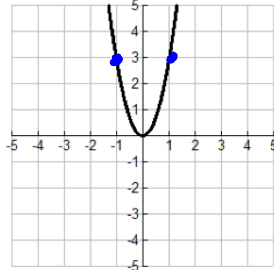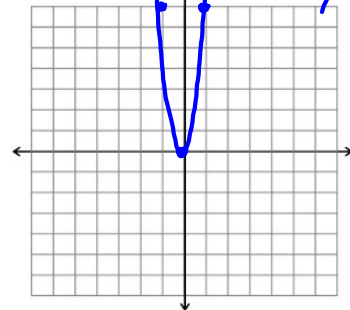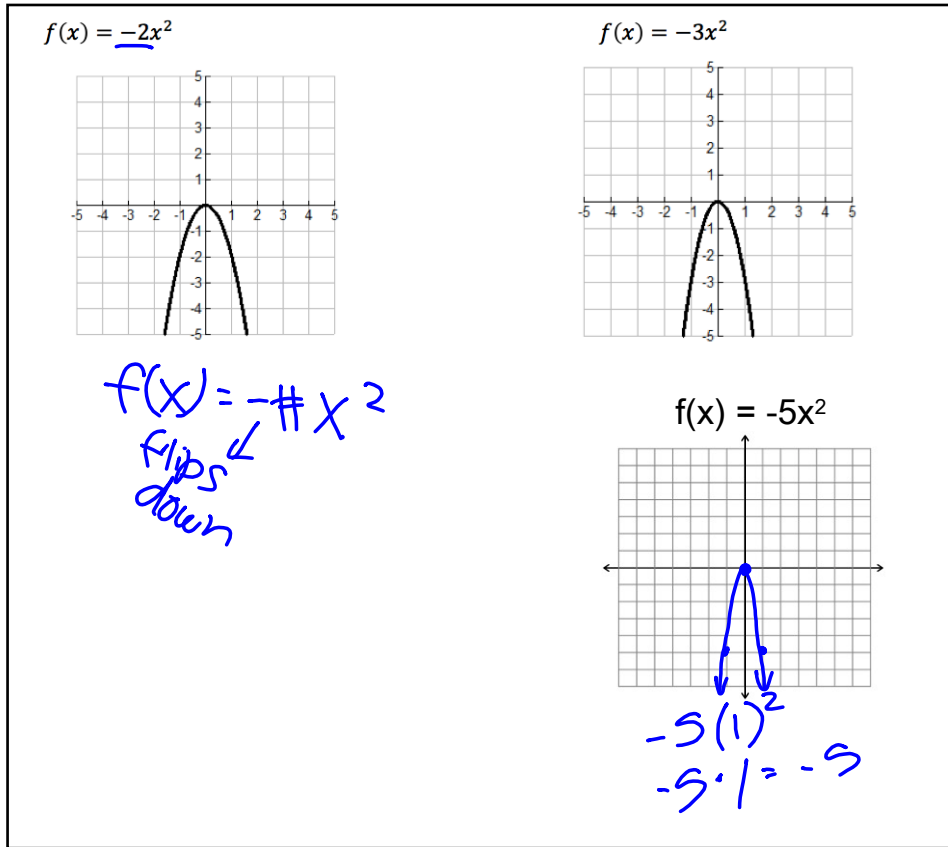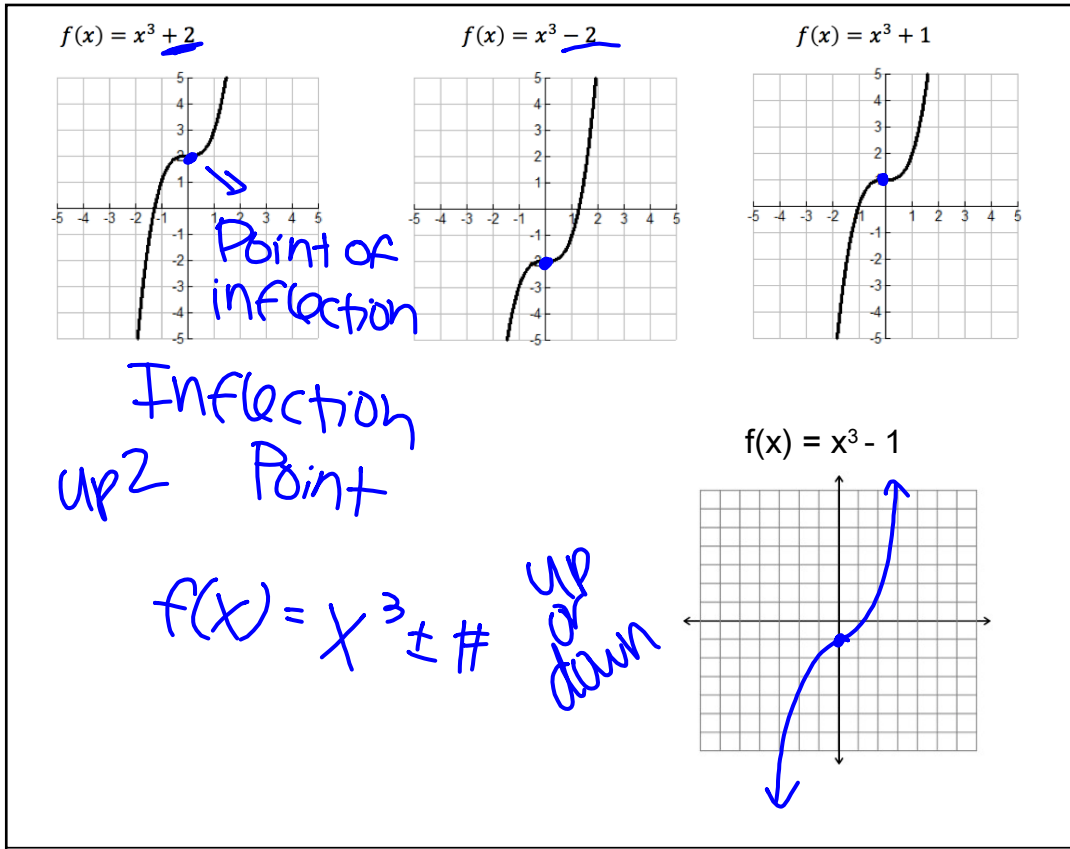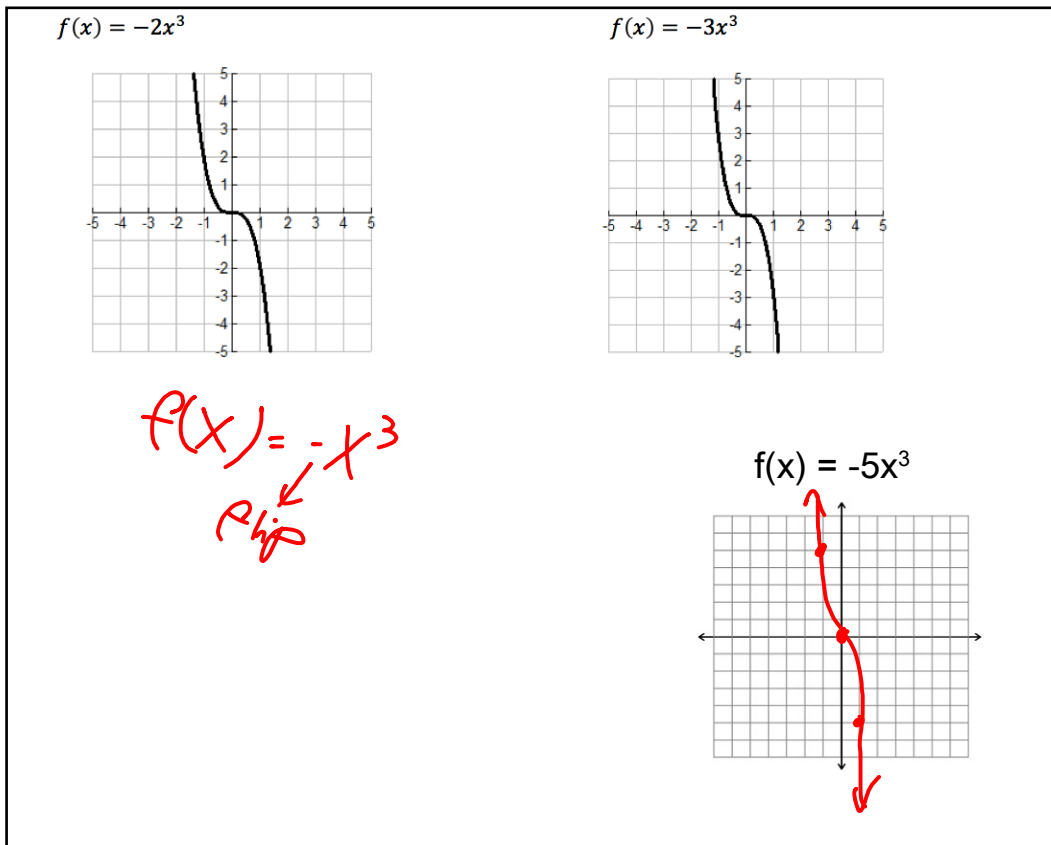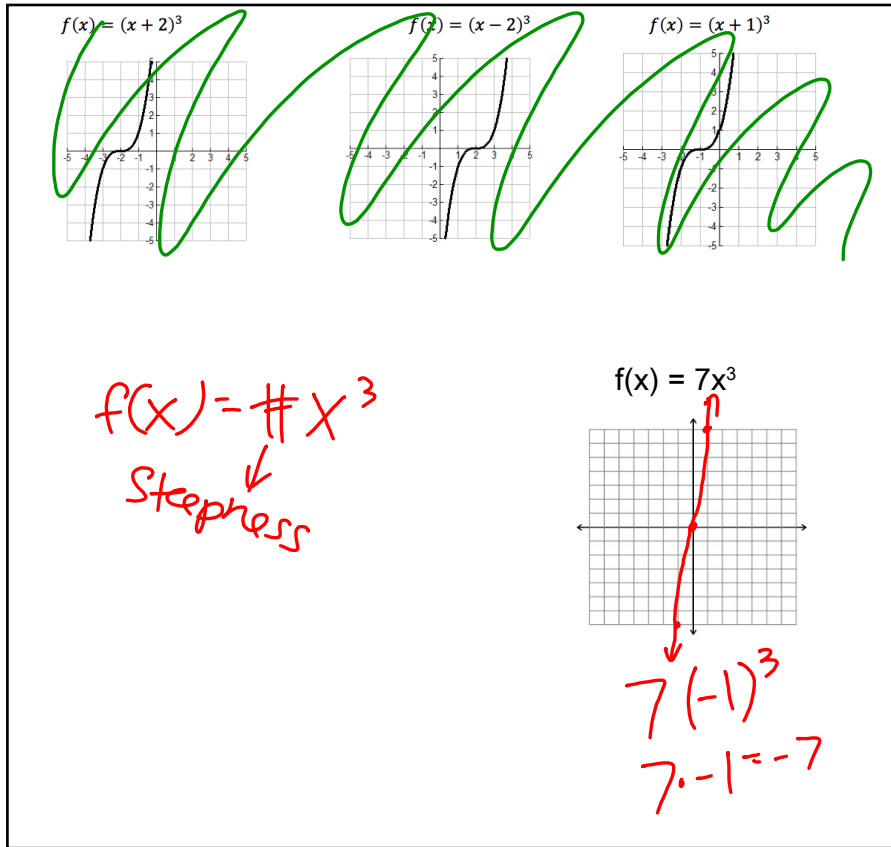
$f(x) = (x + 5)^3 - 2$

POI : (-5, -2)

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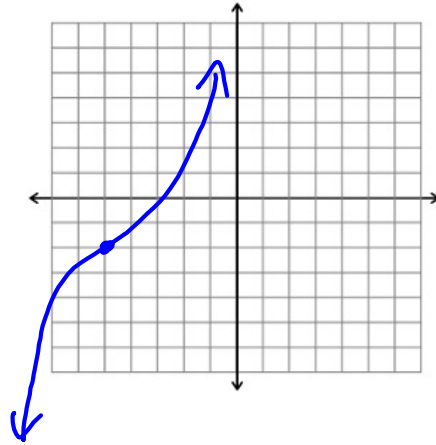
Graphing Form: $f(x) = a(x - h)^n + k$

Steepness/ Flip

L or R

U or D

(h, k)   Quadratic: Vertex   x-value   y-value
         Cubic: inflection point
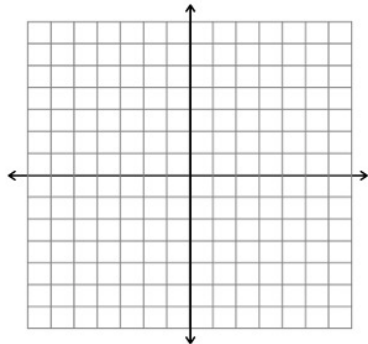
What do you notice about the signs of (h,k)?

x's lie!

Find the vertex of the graph:
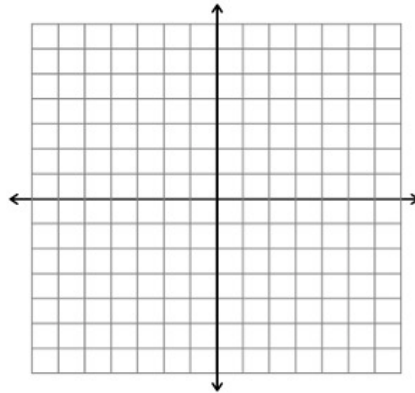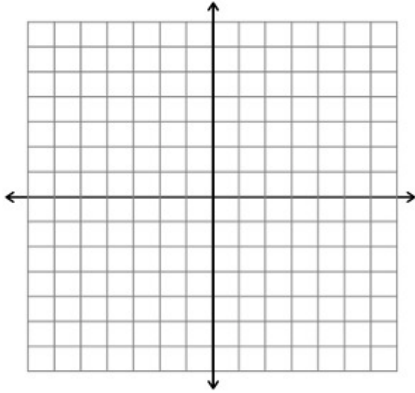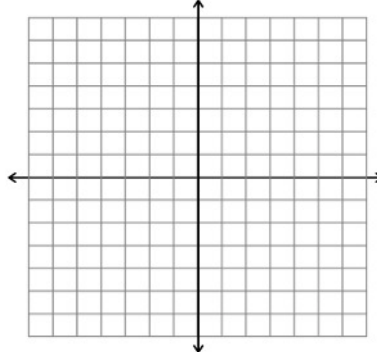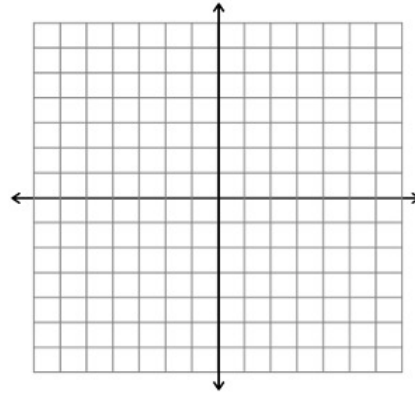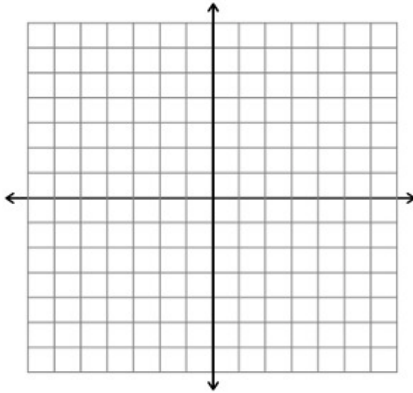
Find the vertex and graph-(find 5 points!)
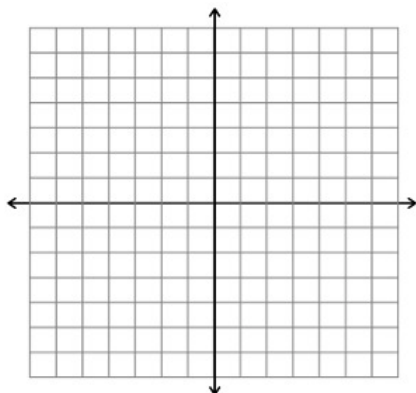
$$f(x) = (x-2)^2 - 1$$

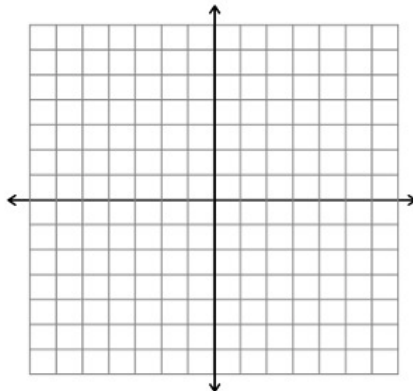$$g(x) = 2(x+4)^2 - 2$$

Find the inflection point of the graph:

Find the inflection point and graph (find 5 points!):
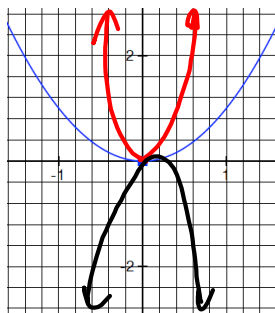
$f(x) = (x-5)^3 + 7$

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

Symmetry

Even: symmetric
about y-axis

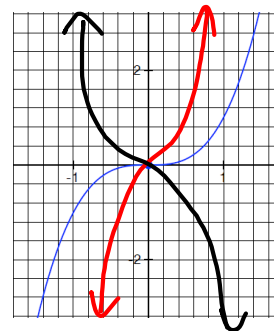(vertical fold)

Odd: symmetric
about origin

(2 folds)

Symmetry

Even: symmetric
about y-axis

Odd: symmetric
about origin

Even, Odd, or Neither?