Is each function linear, quadratic, or neither?
State the quadratic, linear, and constant terms.

1. $y = 3(x+4) = 3x+12$

Linear

Quad: none Lin: 3x Const: 12

2. $f(x) = (x+6)(x-5) = x^2+x-30$

Quadratic

Quad: x^2 Lin: x Const: -30

3. $g(x) = 2x(x^2 + 6x - 1) = 2x^3+12x^2-2x$

Neither

Quad: $12x^2$

Lin: $-2x$

Const: 0

You can now finish Hwk #11

Quadratic in Standard Form:

$y = ax^2 + bx + c$

- Affects if parabola opens Up or Down (min / max)
- Vertical Stretch or Shrink Factor

Affects Vertical Position. (C is the y-int)

Affects Horizontal Position.

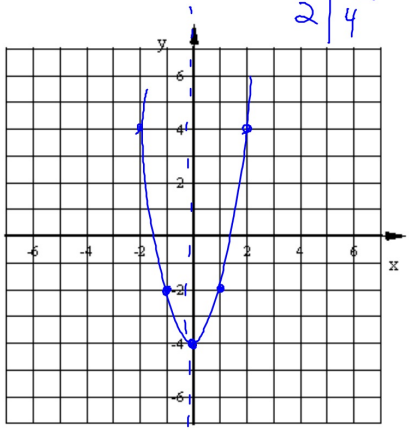
Graphing a quadratic of the form: $y = ax^2 + c$

- Since b=0, parabola hasn't shifted horizontally
- LOS is still: x=0 (y-axis)
- C is the y-intercept and also the Vertex (0,c)
- Use a table or the stretch/shrink factor (a) to find four more points.

Graph each parabola using five points.

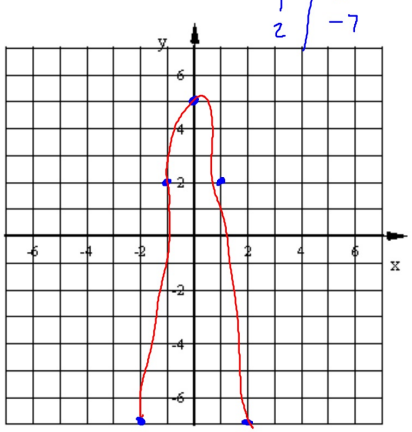
1. $y = 2x^2 - 4$

x	y
1	-2
2	4

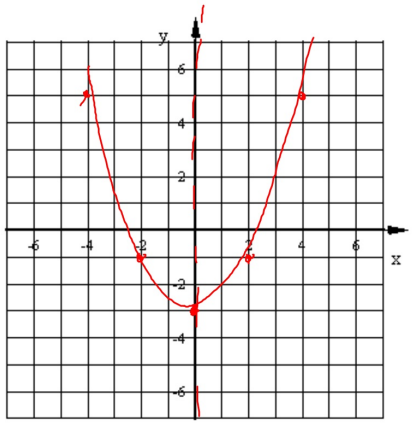


2. $y = -3x^2 + 5$

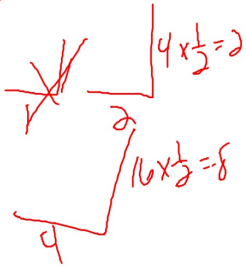
x	y
1	2
2	-7



Graph this parabola: $f(x) = \frac{1}{2}x^2 - 3$



x	y
2	-1
4	5



When b ≠ 0 there has been a horizontal translation so the LOS isn't x=0 anymore.

$y = ax^2 + bx + c$

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

$y = 2x^2 - 20x + 11$

LOS $x = \frac{20}{2(2)}$

$x = 5$

Vertex $(5, -39)$

Find the coordinates of the Vertex and the equation for the LOS.

1. $f(x) = x^2 - 6x + 10$

$\frac{6}{2} = 3 = LOS$

$(3, 1)$

2. $g(x) = -2x^2 - 12x - 1$

$\frac{b}{2a}$

$\frac{12}{-4}$

$-2(-3)^2 - 12(-3) - 1$

$-18 + 36 - 1$

$(-3, 17)$

LOS $x = -3$

$(-3, 17)$

3. $y = x^2 + 5x - 4$

$\frac{-5}{(2)1} = \frac{-5}{2} = LOS$

Vertex $= (-2.5, -10.25)$

$6.25 - 12.5 - 4 = -10.25$