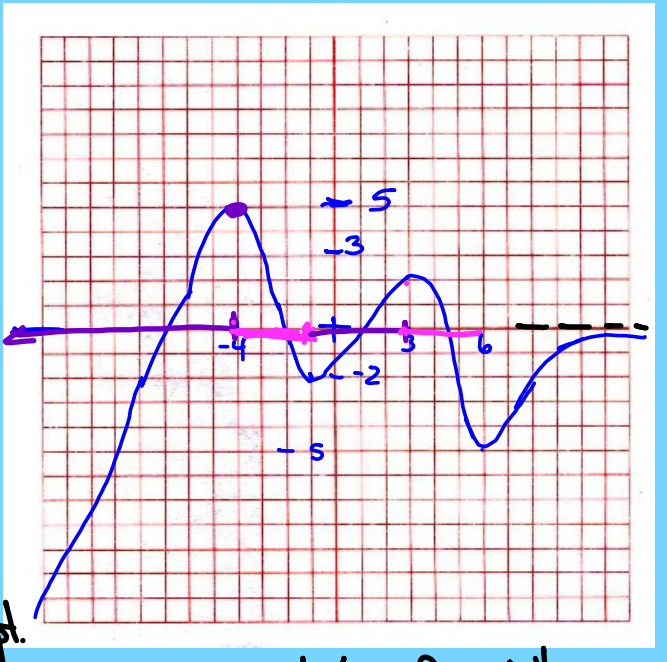
Identifying Features of a Graph

Relative Maximum – any high point (peak)
(-4,5) (3,2)

Relative Minimum – any valley
(-1,-2) (6,-5)

Absolute Maximum – the highest point on graph
(-4,5)

Absolute Minimum – the lowest pt.
None



Interval notation using x-coord.

Increasing Intervals – where the graph rises
(-∞,-4) (-1,3) (6,∞)

Decreasing Intervals – where the graph falls
(-4,-1) (3,6)

L to R

QUADRATICS

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

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

Vertex: $x = \frac{-b}{2a}$ $y =$ sub in x-coord

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$y = x^2 + 6x - 16$

Vertex: $x = \frac{-b}{2a} = \frac{-6}{2(1)} = -3$

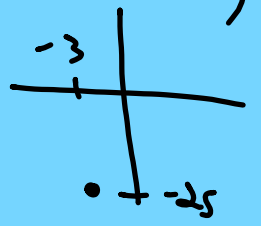
$y = (-3)^2 + 6(-3) - 16$

$= 9 - 18 - 16$

$= -25$

Vertex: $(-3, -25)$

0	6
1	1
2	4
3	9



x-int, 2

x-intercepts:
Let $y=0$

y-intercepts
Let $x=0$

0	0

y-int:
$y = 0^2 + 6(0) - 16$
$y = -16$
$(0, -16)$

$y = x^2 + 6x - 16$

$0 = x^2 + 6x - 16$

$0 = (x+8)(x-2)$

$x = -8, 2$

x-int: $(-8, 0)(2, 0)$

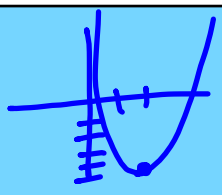
Homework 1) $f(x) = -9 - 12x - 3x^2$

$y = -3x^2 - 12x - 9$

Vertex: $(2, -5)$

Point: $(4, 7)$ (x, y)

Find the eq. of parabola



$y = ax^2 + bx + c$

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

$y = a(x-2)^2 - 5$

$7 = a(4-2)^2 - 5$

$7 = a \cdot 4 - 5$

$7 = 4a - 5$

$12 = 4a$

$3 = a$

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

INVERSES – switch x- + y-coordinates

If $f=\{(x,y)\}$, then $f^{-1}=\{(y,x)\}$

Find f^{-1} eq.

1) Switch x's + y
2) Solve for y

Find the equation of f^{-1}:

$f(x)=\sqrt{4x-3}$

$(x)^2=(\sqrt{4y-3})^2$

$x^2=4y-3$

$\frac{x^2+3}{4}=\frac{4y}{4}$

$\frac{x^2+3}{4}=f^{-1}$

$f(x)=\frac{3x+7}{4x-5}$

$(4y-5)x=\frac{3y+7}{4y-5}(4y-5)$

$4xy-5x=3y+7$

$4xy-3y=5x+7$

$y(4x-3)=5x+7$

$y=\frac{5x+7}{4x-3}$

$f^{-1}=\frac{5x+7}{4x-3}$

$f(x) = \frac{x+6}{3}$ $g(x) = 3x-6$

Are f & g inverse functions?

If $f \circ g$ or $g \circ f = x$, then f & g are inverses.

$f \circ g = \frac{3x-6+6}{3}$

$= x$

Yes, f & g are inverses.

Graph $f(x) = \sqrt[3]{x-2} + 7$ & its inverse.

Right 2 up 7

0	0
1	1
8	2

$x = \sqrt[3]{y-2} + 7$

$(x-7)^3 = \left(\sqrt[3]{y-2}\right)^3$

$(x-7)^3 = y-2$

$(x-7)^3 + 2 = y$

Right 2 up

0	0
1	1
2	8