Identifying Features of a Graph

Relative Maximum any high pt.

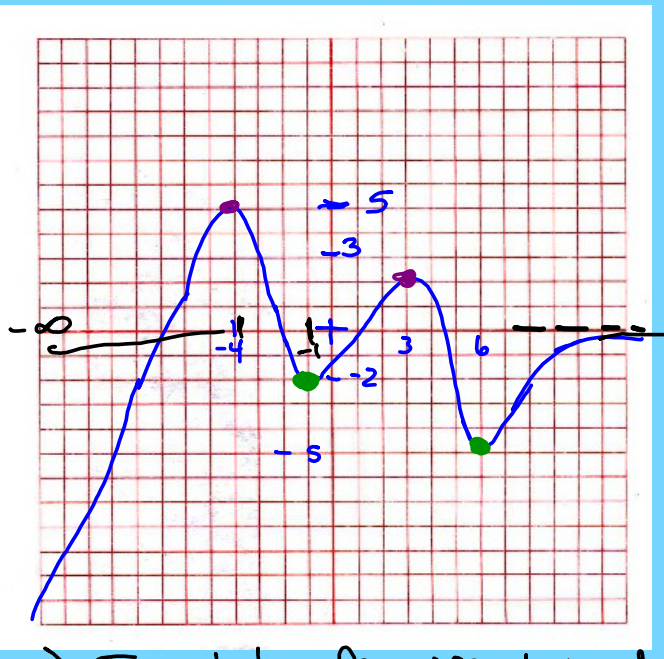
Relative Minimum any low pt.

Absolute Maximum (-4, 5)

Absolute Minimum None

Increasing = Rises from L to R

Decreasing = Falls from L to R



Inc. Intervals = use X-coord
$(-\infty, -4)$ $(-1, 3)$ $(6, \infty)$

Dec Intervals
$(-4, -1)$ $(3, 6)$

QUADRATICS

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

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

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

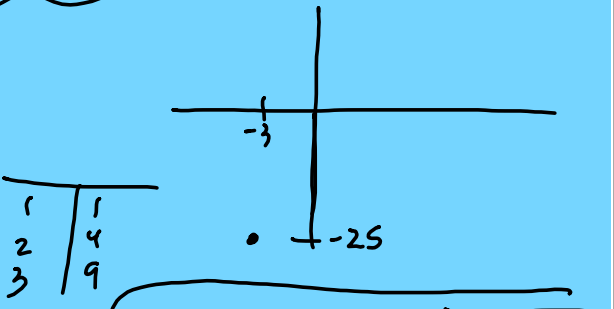
y = sub in x-coord.

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

$x = \frac{-6}{2(1)} = -3$

$y = 9 - 18 - 16 = -25$

$(-3, -25)$



1	1
2	4
3	9

x-int: Let $y = 0$

y-int: Let $x = 0$

0	0

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

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

$x = -8, 2$

$(-8, 0)$

$(2, 0)$

y-int: $y = 0 + 0 - 16$

$y = -16$

$(0, -16)$

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

Vertex: $(2, -5)$

Point: $(\underset{x}{4}, \underset{y}{7})$

Find the eq.

$y = ax^2 + bx + c$ $\quad y = a(x-h)^2 + k$

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

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

$7 = 4a - 5$

$\frac{12}{4} = \frac{4a}{4}$

$3 = a$

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

INVERSES

– Switch x & y variables in an equation
– Switch x & y-coord.

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

1) Switch x & y
2) Solve for y.

Find the equation of f^{-1}:

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

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

$x^2 = 4y-3$

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

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

Graphs reflect over $y=x$

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

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

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

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

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

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

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

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

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

$f \circ g = x$

$g \circ f = x$

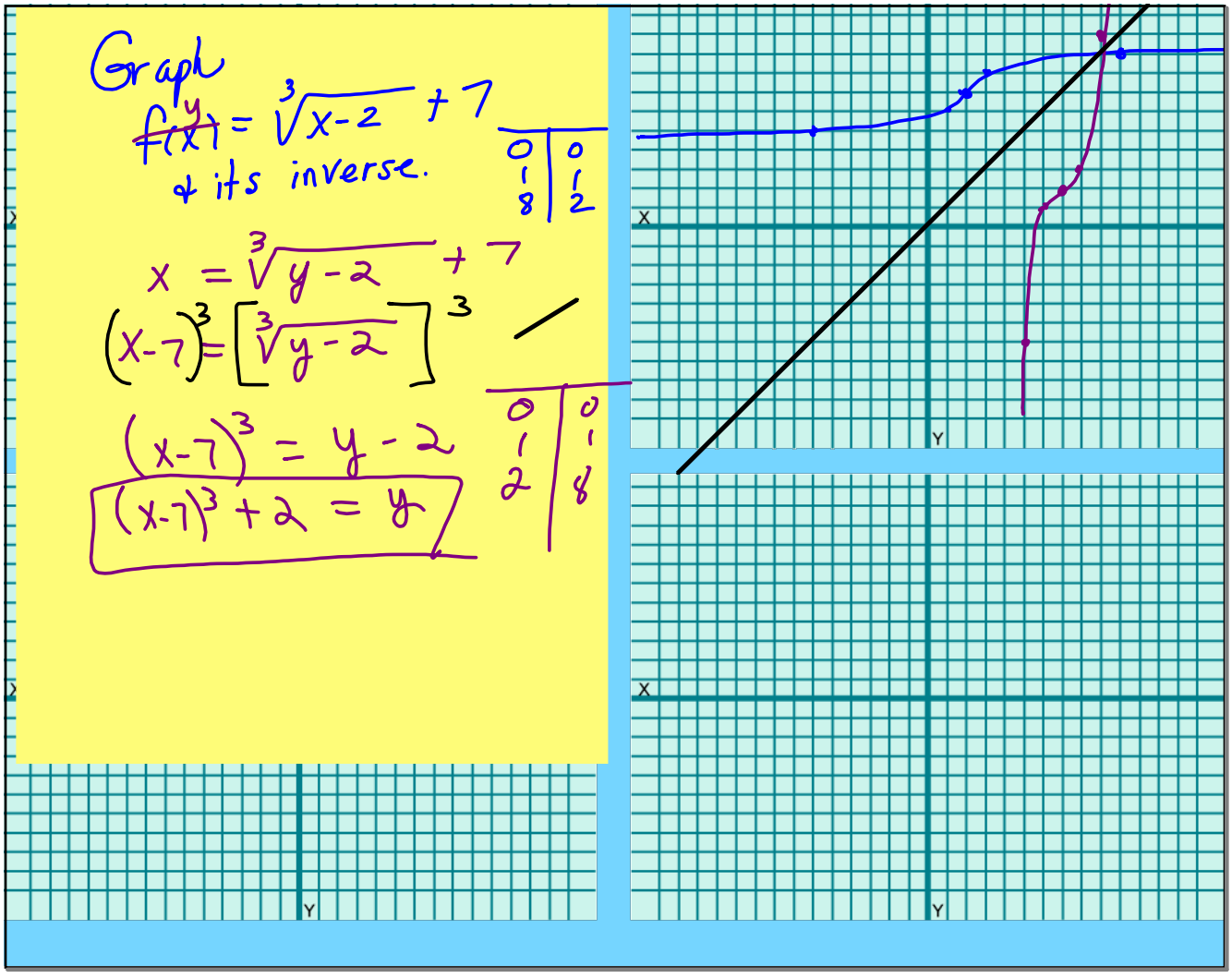
Are f + g inverse functions?

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

$$= \frac{3x}{3}$$

$$= x$$

Yes, f + g are inverses.


Graph
~~f(x)~~ y = ∛(x-2) + 7
& its inverse.
0 | 0
1 | 1
8 | 2
x = ∛(y-2) + 7
(x-7)³ = [∛(y-2)]³
(x-7)³ = y-2
(x-7)³ + 2 = y
0 | 0
1 | 1
2 | 8
X
Y
X
Y
X
Y