Functions Review

Fxn-

The vertical line test **is used to determine whether a graph is a fxn.**

DOMAIN- set of all x-values

RANGE- set of all y-values

6 BASIC CURVES – attach graph paper

FXN NOTATION- f(x) – "f of x"

Ex. $f(x) = 2x^2 - 4$ $\quad g(x) = \frac{1}{x+2}$ $\quad h(x) = -x - 1$

Find: f(3) f(x – 3) h(f(x)) g(f(-5))

$$f(3) = 2(3)^2 - 4$$
$$= 2(9) - 4$$
$$= 18 - 4$$
$$= 14$$

$$f(x-3) = 2(x-3)^2 - 4$$
$$= 2(x^2 - 6x + 9) - 4$$
$$= 2x^2 - 12x + 18 - 4$$
$$= 2x^2 - 12x + 14$$

$$h(f(x)) = -(2x^2 - 4) - 1$$
$$= -2x^2 + 4 - 1$$
$$= -2x^2 + 3$$

$$f(-5) = 2(-5)^2 - 4$$
$$= 2(25) - 4$$
$$= 50 - 4$$
$$= 46$$

$$g(46) = \frac{1}{46+2}$$
$$= \frac{1}{48}$$

For each, describe the transformation and give the mapping notation.

a) $y = (x - 3)^2 + 4$

$(x,y) \Rightarrow (x+3, y+4)$

right 3
up 4

b) $y = \sqrt{-x+3} - 1$

$\hookrightarrow y = \sqrt{-(x-3)} - 1$

$(x,y) \Rightarrow (-x+3, y-1)$

reflect y-axis
right 3
down 1

c) $y = -x^3 + 4$

$(x,y) \Rightarrow (x, -y+4)$

reflect x-axis
up 4

d) $y = -\sqrt{x+4} - 1$

$(x,y) \Rightarrow (x-4, -y-1)$

reflect x-axis
left 4
down 1

e) $y = \frac{1}{x-2} + 5$

$(x,y) \Rightarrow (x+2, y+5)$

right 2
up 5

f) $y = 2|x+3| - 2$

$(x,y) \Rightarrow (x-3, 2y-2)$

left 3
VS x2
down 2

g) $y = (\frac{1}{2}x - 2)^2$

$\hookrightarrow y = \left(\frac{1}{2}(x-4)\right)^2$

$(x,y) \Rightarrow (2x+4, y)$

HS x2
right 4

h) $y = |-2x + 6| + 4$

$y = |-2(x-3)| + 4$

$(x,y) \Rightarrow (-\frac{1}{2}x+3, y+4)$

HS x $\frac{1}{2}$
reflect y-axis
right 3
up 4

INVERSE Functions and Equations

An inverse is a reflection in the line $y=x$ **.**

EX Graph the inverse of $y = 2|x - 4| + 5$

$(x,y) \rightarrow (x+4, 2y+5)$

x	y
-3	3
-2	2
-1	1
0	0
1	1
2	2
3	3

BASIC

→

x	y
1	11
2	9
3	7
4	5
5	7
6	9
7	11

IMAGE

→

x	y
11	1
9	2
7	3
5	4
7	5
9	6
11	7

INVERSE

When determining the inverse equation, we _____

Switch x & y **.**

Ex Find the inverse equation of each.

a) $y = \frac{7-x}{4}$ **b)** $y = \frac{9}{x} + 2$ **c)** $y = (x + 7)^2$ **d)** $f(x) = 6 - 5x^2$

a) $\boxed{\text{INV}}$ $x = \frac{7-y}{4}$

$4x = 7 - y$

$y = 7 - 4x$

b) $\boxed{\text{INV}}$ $x = \frac{9}{y} + 2$

$x - 2 = \frac{9}{y}$

$y = \frac{9}{x-2}$

c) $\boxed{\text{INV}}$ $x = (y+7)^2$

$\pm\sqrt{x} = y + 7$

$-7 \pm \sqrt{x} = y$

d) $\boxed{\text{INV}}$ $x = 6 - 5y^2$

$x - 6 = -5y^2$

$-x + 6 = 5y^2$

$\frac{-x+6}{5} = y^2$

$\pm\sqrt{\frac{-x+6}{5}} = y$