Math 11U **Introduction to Functions Test** **Name:** Mr Hagen

$\frac{\quad}{13}K$ $\frac{\quad}{18}T$ $\frac{\quad}{16}C$

1. What is a function? ___1K

A function has a one to one relationship with the x and y values. Every x (input) produces only one y-value (output) - only one answer for every x.

2. State whether each is a function or just a relation. Justify your answer. ___ 8K

a) {(0,3), (5,3), (2,7), (1,8), (6,4), (3,3)}

A function because every x produces one y.

b) $y^2 = 2x - 6$

relation because y^2 produces two values.

$y = \pm\sqrt{2x-6}$

$y = \pm\sqrt{2(3)-6}$

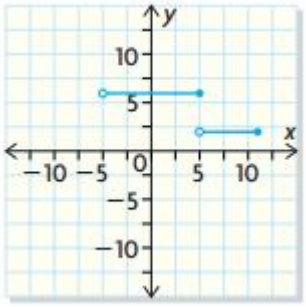
$y = \pm\sqrt{6}$

$y = \pm 2$

c) {(1,5), (2,3), (4,7), (6,2), (2,5), (3,3)}

Not a function because x=2 has two options

d)



Function because it passes the VLT

3. Let $f(x) = 3x + 5$ and $g(x) = -2x^2 - 3x + 8$. ___4K

a) Evaluate $f(2)$

$f(2) = 3(2) + 5$

$f(2) = 11$

b) Find x so that $f(x) = -7$

$-7 = 3x + 5$

$-12 = 3x$

$-4 = x$

$\therefore f(-4) = -7$

c) Evaluate $g(-3)$

$g(-3) = -2(-3)^2 - 3(-3) + 8$

$= -2(9) + 9 + 8$

$= -18 + 9 + 8$

$= -1$

d) Evaluate $f(2) - g(-3)$

$= 11 - (-1)$

$= 11 + 1$

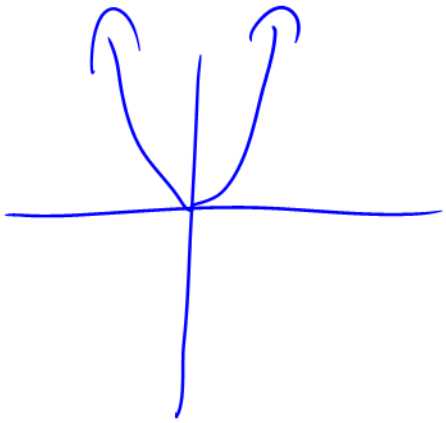
$= 12$

4. We looked at five functions this unit. One is a linear function, $f(x) = x$. For the other four functions, give their name, their function (equation), table of values and sketch. **Note: a sketch is a simple drawing without numbers which should only take 20 seconds to draw** ____16C

① Quadratic Function

$f(x) = x^2$

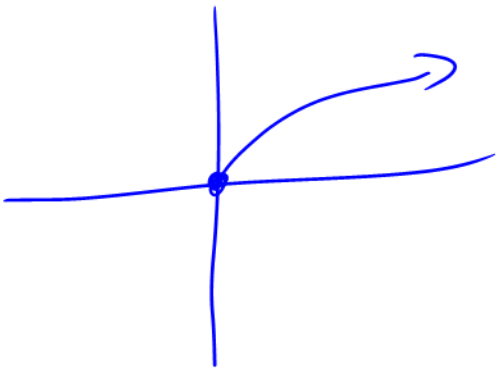
x	y
-2	4
-1	1
0	0
1	1
2	4



② Square Root Function

$f(x) = \sqrt{x}$

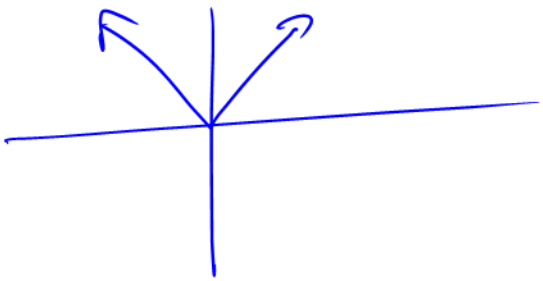
x	y
0	0
1	1
4	2
9	3
16	4



③ Absolute Value Function

$f(x) = |x|$

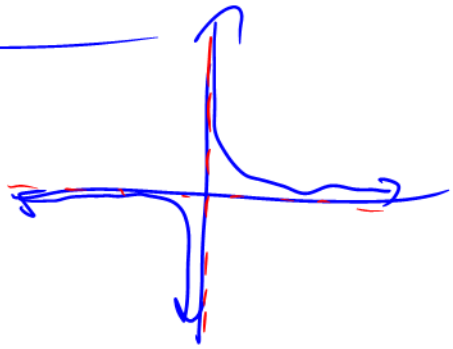
x	y
-2	2
-1	1
0	0
1	1
2	2



④ Reciprocal Function

$f(x) = \frac{1}{x}$

x	y
-2	-1/2
-1	-1
-1/2	-2
0	0
1/2	2
1	1
2	1/2



5. Determine the domain and range for each function below: ___6T

a) $f(x)=\frac{-1}{2}(x+4)^2+6$

D: $\{x \in \mathbb{R}\}$

R: $\{f(x) \in \mathbb{R} \mid f(x) \leq 6\}$

b) $g(x)=2\sqrt{2(x+4)}-3$

D: $\{x \in \mathbb{R} \mid x \geq -4\}$

R: $\{g(x) \in \mathbb{R} \mid g(x) \geq -3\}$

c) $h(x)=\frac{4}{3x-12}+2$ $\rightsquigarrow 3(x-4)$ not equal

D: $\{x \in \mathbb{R} \mid x \neq 4\}$

R: $\{h(x) \in \mathbb{R} \mid h(x) \neq 2\}$

#5

6. Graph *f(x)* and *g(x)* (from above) by using transformations on the same set of axes. Organize your answers and label which graph is which function. [T:12]

f(x)

① V. Str of $-\frac{1}{2}$
② H. Shift of -4
③ V. Shift of $+6$

x	y
-2	4
-1	1
0	0
1	1
2	4

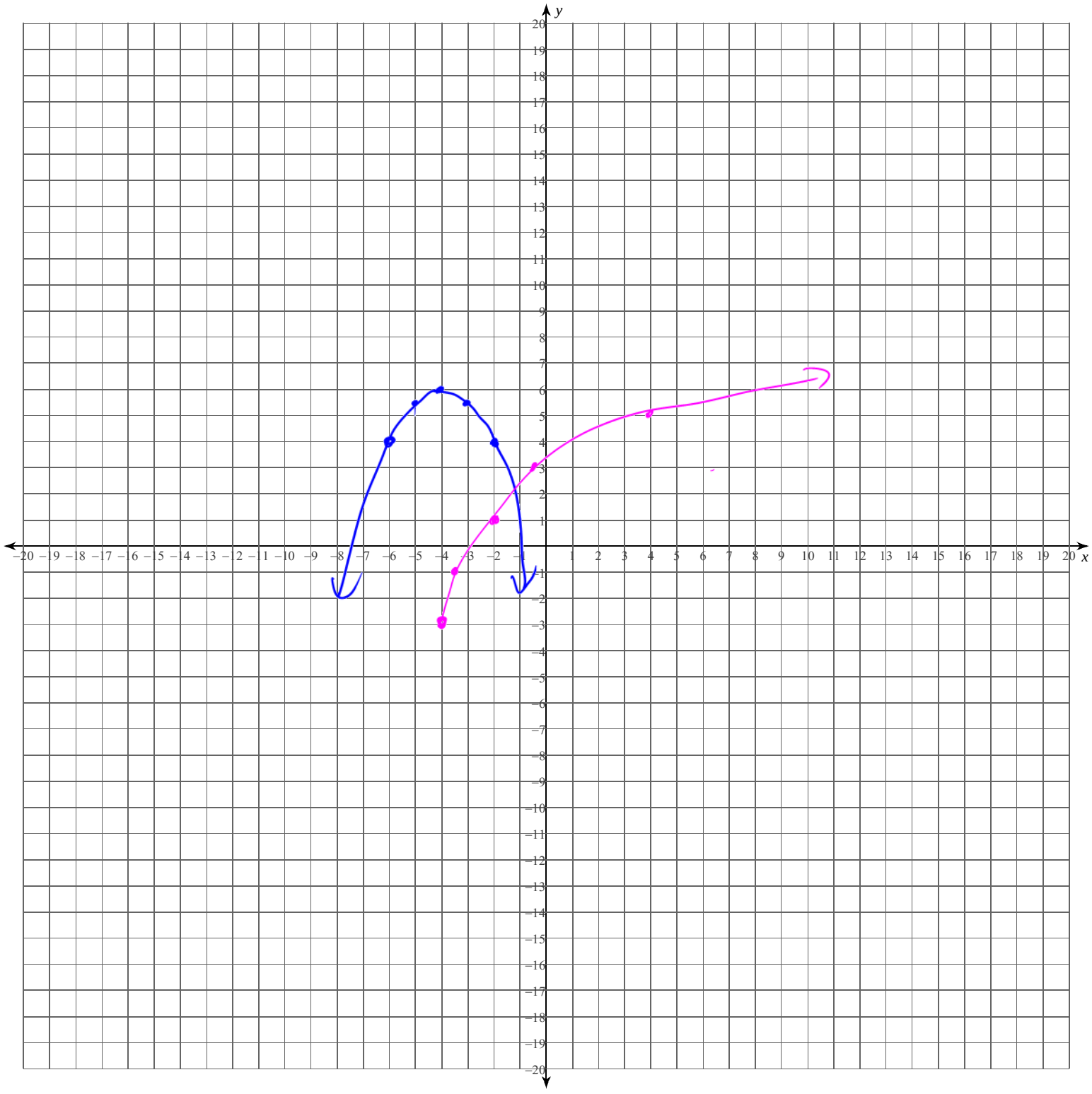
$x-4$	$-\frac{1}{2}y+6$
-6	4
-5	5.5
-4	6
-3	5.5
-2	4

g(x)

① V. Str of 2
② H. Str of $\frac{1}{2}$ or $\div 2$
③ H. Sh of -4
④ V. Sh of -3

x	y
0	0
1	1
4	2
9	3
16	4

$\frac{1}{2}x-4$	$2y-3$
-4	-3
-3.5	-1
-2	1
0.5	3
4	5


y
x