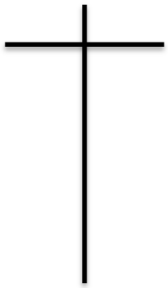
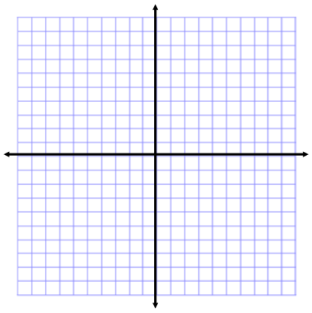
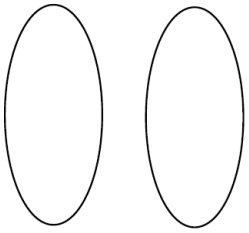
Name_____ Video #5 Notes A2 Summer- Functions/transformations

A **function** is a relation for which each input has exactly ONE output. If any input has more than one output, the relation is NOT a function.

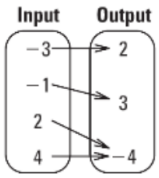
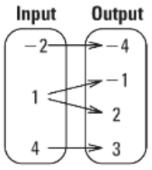
- **Discrete** functions consist of separate points that are not connected
- **Continuous** functions consist of a graph that is unbroken and has an infinite amount of coordinates.

A relation can be represented in the following ways:

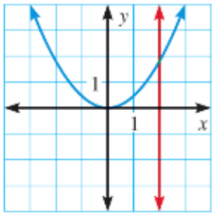
Ordered Pairs	Table	Graph	Mapping Diagram
(−2,2) (−2,−2) (0,1) (3,1)			

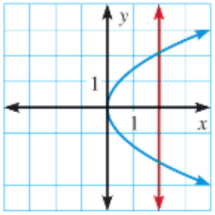
Domain: the set of input values (all x-coordinates)	**Range**: the set of output values (all y-coordinates)
Ex. What is the domain of relation above?	Ex. What is the range of the relation above?

Tell whether the relation is a function.

1.	2.	3. $\{(0,-5)\ (2,1)\ (3,1)\ (5,-2)\}$
		

Vertical Line Test: a relation is also a function if and only if no vertical line intersects the graph at more than one point.

Function 

Not a function 

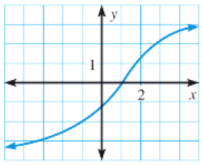
Notation for Domain and Range:

Inequality notation and Interval notation are methods for writing down a set of numbers.

Inequality Notation	Interval Notation	Types of Brackets
$x > 5$		**Exclusive (round bracket):** The value is *excluded* from the set of numbers *Infinity symbols always use round brackets **Inclusive (square bracket):** The value is *included* with the set of numbers ***Union Symbol:** $\cup$
$x \geq 5$		
$x < 7$		
$x \leq 7$		
$4 < x \leq 9$		
$6 \leq x < 8$		
$3 < x < 12$		
$x < 5$ or $x \geq 8$		

Identify the domain and range. Tell whether the relation is a function. If it is a function, identify if it's discrete or continuous.

4.



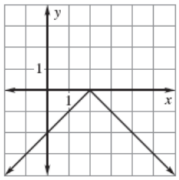
Domain: _____

Range: _____

Function: Yes No

Discrete Continuous

5.



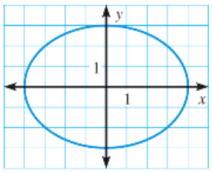
Domain: _____

Range: _____

Function: Yes No

Discrete Continuous

6.



Domain: _____

Range: _____

Function: Yes No

Discrete Continuous

7. Tell whether or not the relation is a function: (2, 3), (-2, -2), (3, -4), (-3, 4), (-2,1) Why/ Why not?

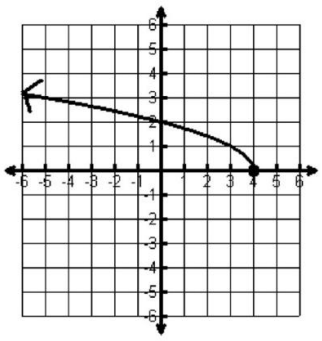
Identify if the following

8. A)

Function:

Domain:

Range:

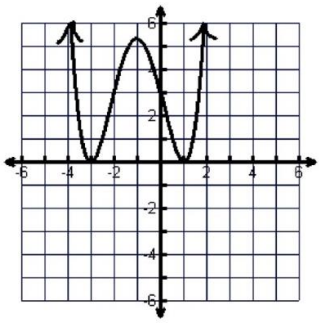


B)

Function:

Domain:

Range:



Evaluating a function given an equation, table, or graph.

10. $f(x)=\frac{2x-3}{x^2+1}$

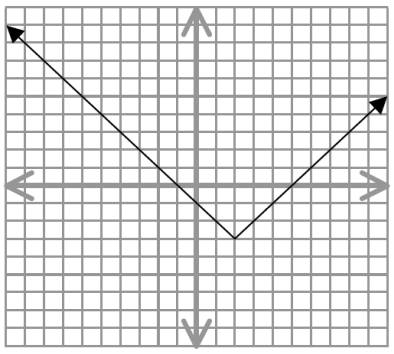
$f(2)=$_____

11.

x	*f(x)*
-1	5
0	3
1	-8
2	-10
3	-4
4	0

$f(2)=$_____

12.



$f(2)=$_____

Types of functions this year:

Linear	$y=x$	
Absolute Value	$y=\lvert x\rvert$	
Quadratic	$y=x^2$	
Polynomial	$y=x^{a+\cdots}$	
Radical	$y=\sqrt{x}$	

Exponential/Logarithmic	$y = 2^x / \ y = logx$	
Rational	$y = \frac{1}{x}$	
Sin/Cos	$y = sinx \ / \ y = cosx$	

Transformation Notes $\boldsymbol{y = a\,(x - h) + k}$ $\boldsymbol{y = a|x - h| + k}$

Vertical Shift (up and down)

$f(x) + k$

$f(x) - k$

Horizontal Shift (left and right

$f(x + h)$

$f(x - h)$

Reflects across x-axis

$-a\,f(x)$

Reflects across y- axis

$a\,f(-x)$

Vertical Stretch/Compression

$a \cdot f(x)$

$a > 1$ V Stretched

$0 < a < 1$ V Compressed

Horizontal Stretch/Compression

$f\,(a \cdot x)$

$a > 1$ H. Compressed

$0 < a < 1$ H. Stretched

$y = 2(x + 4) - 5$

$y = \frac{1}{4}(x - 6) + 3$

$y = -3(x) + 8$