NCM3 1-to-1 Functions Name:_____ #____

A function is **one-to-one** if both the function and its inverse are functions.

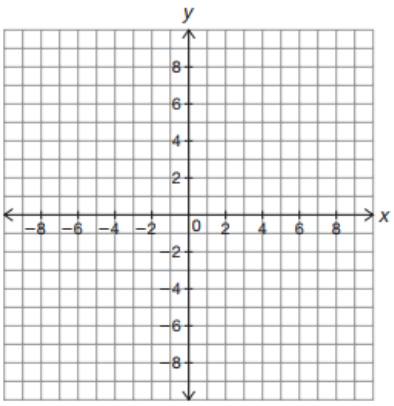
1) Adam and Eve are working on a homework assignment in which they must identify all functions that are one-to-one functions. Adam says that all linear functions are one-to-one functions so they don't even need to look at the linear functions. Eve disagrees, and says that not all linear functions are one-to-one functions. Who is correct? Explain how you determined which student is correct.

2) For each given function do the following:
   - Complete a table of values for the function and its inverse.
   - Use the coordinate plane shown to sketch the graph of the **function** using a **solid** line. Then sketch the **inverse** of the function on the same coordinate plane using a **dashed** line.
   - Determine whether the function is a one-to-one function. Explain your reasoning.

a. $f(x) = 3x - 6$

x	$f(x)$
−2	
−1	
0	
1	
2	

x	Inverse of $f(x)$
	−2
	−1
	0
	1
	2

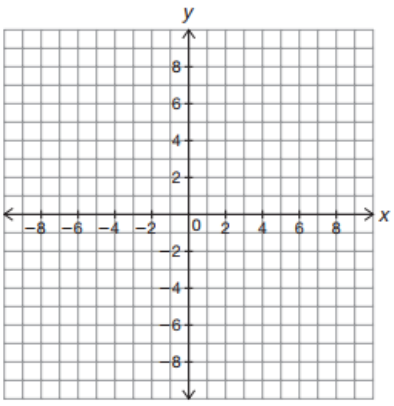


Is the function $f(x)$ a one-to-one function?

b. $g(x) = -x + 4$

x	$g(x)$
−2	
−1	
0	
1	
2	

x	Inverse of $g(x)$
	−2
	−1
	0
	1
	2

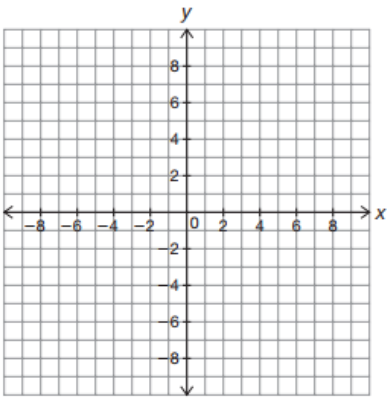


Is the function $g(x)$ a one-to-one function?

c. $h(x) = 2$

x	$h(x)$
−2	
−1	
0	
1	
2	

x	Inverse of $h(x)$
	−2
	−1
	0
	1
	2

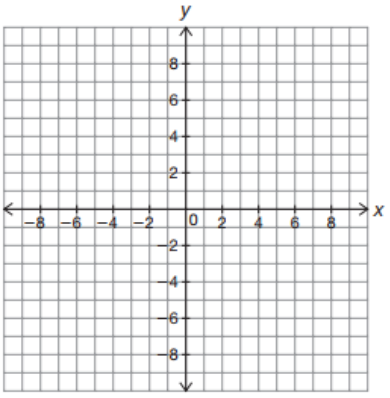


Is the function $h(x)$ a one-to-one function?

d. $p(x) = 2x^2 + 2$

x	$p(x)$
−2	
−1	
0	
1	
2	

x	Inverse of $p(x)$
	−2
	−1
	0
	1
	2

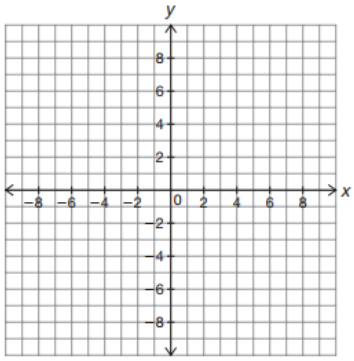


Is the function $p(x)$ a one-to-one function?

e. $k(x) = 2^x$

x	$k(x)$
−2	
−1	
0	
1	
2	

x	Inverse of $k(x)$
	−2
	−1
	0
	1
	2

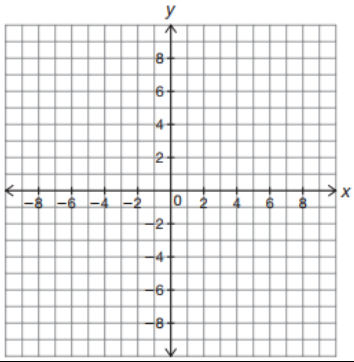


Is the function $k(x)$ a one-to-one function?

f. $r(x) = |x|$

x	$r(x)$
−2	
−1	
0	
1	
2	

x	Inverse of $r(x)$
	−2
	−1
	0
	1
	2



Is the function $r(x)$ a one-to-one function?

3. Use the word bank to complete each sentence.

Always	Sometimes	Never

a. A linear function is _____ a one-to-one function.

b. An exponential function is _____ a one-to-one function.

c. A quadratic function is _____ a one-to-one function.

d. A linear absolute value function is _____ a one-to-one function.