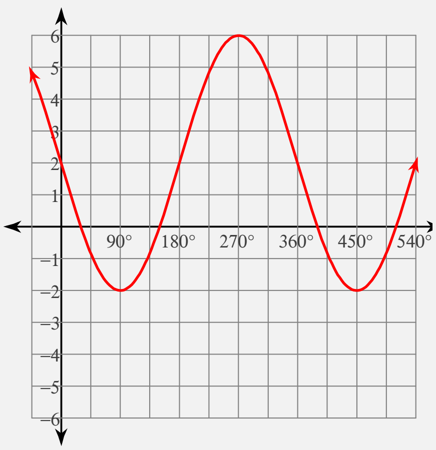
1) Determine if $y = f(x)$ is a well-defined function. Why/Why not?

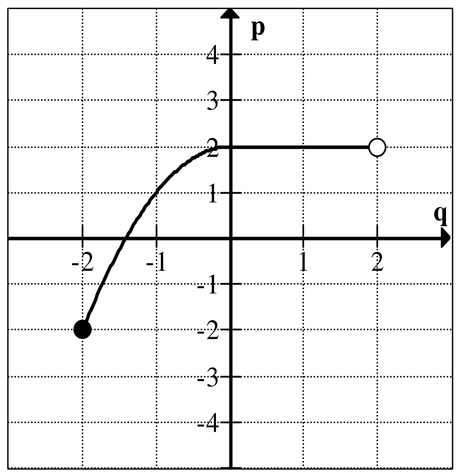
x	0	1	2	2	3
$f(x)$	-5	-4	3	7	7

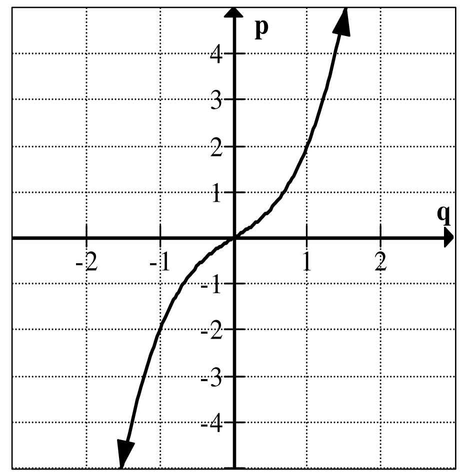
2) Determine if $y = g(x)$ is a well-defined function:



A function , $p = f(q)$ is called **one-to-one** if every value of *p* in the range has a unique value of *q* in the domain associated to it. In other words, *f* is one-to-one if $f(x_1) = f(x_2)$ *automatically* implies that $x_1 = x_2$. One-to-one is often abbreviated 1-1, or written in fancy math lingo "injective". The **horizontal line test** states that if every horizontal line intersects the graph of a function *f* in at most one point, then *f* is one-to-one.

3) Determine if the functions are 1-1.

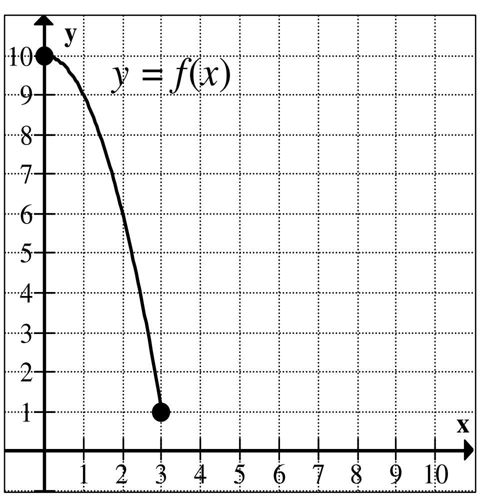




If *y* is a one-to-one function of *x*, then *x* will always be a one-to-one function of *y*. In this case, if $y = f(x)$, then the function $x = g(y)$ will be a new function where the roles of domain and range have reversed. The function *g* is called the **inverse function** of *f*.

Note: $f^{-1}(x) \neq \frac{1}{f(x)}$

4) For the graph of the 1-1 function shown,



a) Evaluate $f(1)$

b) Evaluate $f^{-1}(1)$

c) Evaluate $f(3)$

d) Evaluate $f(1)^{-1}$

e) Solve $f(x) = 1$

f) Evaluate $f(3^{-1})$

g) Evaluate $f^{-1}(6)$

h) Sketch $f^{-1}(x)$

5) Let $f(x) = 2x + 1$. Find the inverse.

Domain of f :

Range of f:

Domain of f^{-1}

Range of f^{-1}

6) Let $g(x) = \frac{x-5}{2x+1}$. Find the inverse.

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Domain of g :

Range of g:

Domain of g^{-1}

Range of g^{-1}

7) The function g is defined in the table shown. Fill in the missing entries.

x	-5	-2	-1	0	2	3	5
$g(x)$	3	-1	5	-5	0	-2	2
$g^{-1}(x)$							
$g^{-1}(g(x))$							

Given the graph, graph the inverse function on the same coordinate plane.