

Inverse

**Find the inverse
from a table or set
of ordered pairs**

**Find the inverse
from a graph**

**Find the inverse
from an equation**

relation - formed when the input (x) & output (y) values of the original relation switch
 inverse \rightarrow switch x & y

function - if the inverse of function $f(x)$ is also a function
 $f^{-1}(x)$

① $(3,4)$ $(5,6)$ $(7,8)$ $(9,10)$
 Find inverse \rightarrow switch x & y
 $(4,3)$ $(6,5)$ $(8,7)$ $(10,9)$
 inverse

②

x	y
3	0
4	3
6	2
9	0
10	6

function

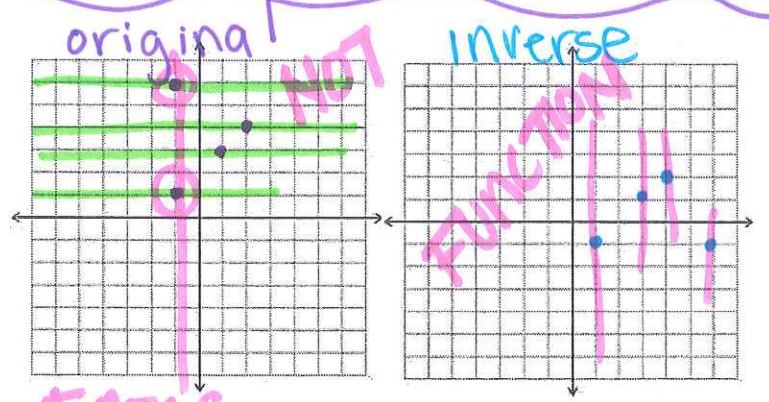
x	y
0	3
3	4
2	6
0	9
6	10

NOT a function

③ $(1,3)$ $(-1,6)$ $(2,4)$ $(-1,1)$
 inverse $(3,1)$ $(6,-1)$ $(4,2)$ $(1,-1)$

vertical line test \rightarrow \checkmark to see if function

horizontal line test \rightarrow \checkmark to see if inverse is function



FAILS passes horizontal test = inverse is function

④ Find inverse of $f(x) = 10x - 28$
 switch x & y
 $x = 10y - 28$
 $\frac{x+28}{10} = \frac{10y}{10} \rightarrow$ solve for y
 $f^{-1}(x) = \frac{x+28}{10}$

⑤ Verify $f(x) = 7x - 4$ & $f^{-1}(x) = \frac{1}{7}x + \frac{4}{7}$
 Show that $f(f^{-1}(x)) = x$
 $f^{-1}(f(x)) = x$
 $7(\frac{1}{7}x + \frac{4}{7}) - 4 = x$
 $\frac{1}{7}(7x - 4) + \frac{4}{7} = x$