

Warm up

1. verify  $f(x) = 6x + 2$  &  $g(x) = \frac{x-2}{6}$  are inverses.

$$f(g(x)) = x \quad f(g(x)) = 6\left(\frac{x-2}{6}\right) + 2 = x - 2 + 2 = x \checkmark$$

$$g(f(x)) = x \quad g(f(x)) = \frac{6x+2-2}{6} = \frac{6x}{6} = x \checkmark$$

yes!

2. Find the inverses of ...

a)  $f(x) = 2\sqrt{x+1}$   
 $y = 2\sqrt{x+1}$

$$x = 2\sqrt{y+1}$$

$$\left(\frac{x}{2}\right)^2 = (\sqrt{y+1})^2$$

$$\frac{x^2}{4} = y + 1$$

$$\frac{x^2}{4} - 1 = y$$

$$\boxed{f^{-1}(x) = \frac{x^2}{4} - 1}$$

b)  $g(x) = (x-3)^2$   
 $y = (x-3)^2$

$$\sqrt{x} = \sqrt{(y-3)^2}$$

$$\pm\sqrt{x} = y - 3$$

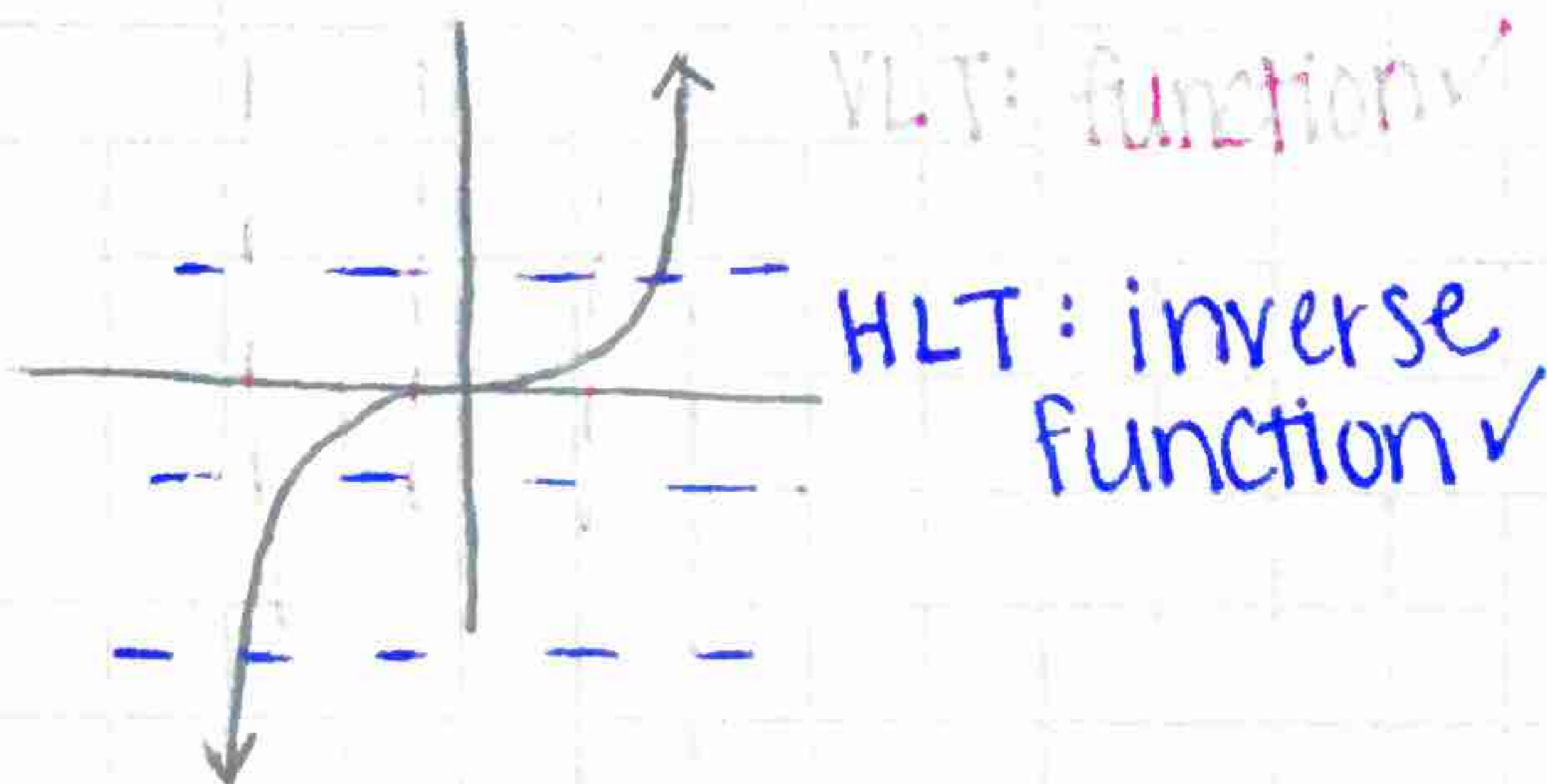
$$\boxed{\pm\sqrt{x} + 3 = y}$$

# Inverses Day 2

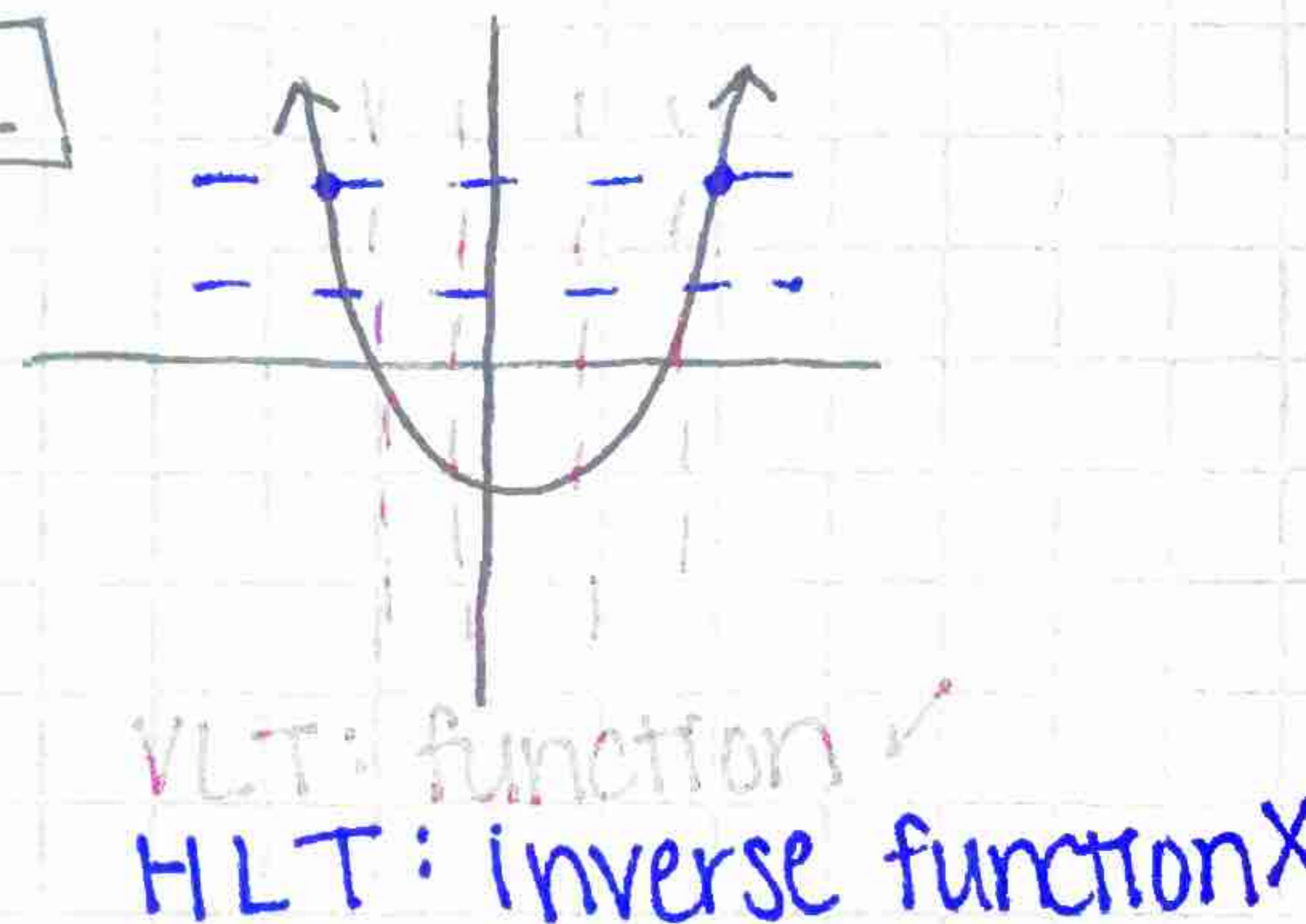
One to one

- an equation who's a function & the inverse is a function  
→ passes the vertical & horizontal line test

ex 1



ex 2



ex 3

x	-4	-2	0	3	5
y	<u>7</u>	2	<u>1</u>	1	-3

function ✓ → no x doubles

inverse function (no) → doubles in y's

(tables)

x	2	4	6	8	10
f(x)	7	-3	5	3	4

① does  $f(x)$  have an inverse function? yes, no y doubles

②  $f(6) = 5$

③  $f^{-1}(4) =$

④  $f(f^{-1}(5)) = f(6) = 5$

⑤ create the table for the inverse

x	7	-3	5	3	4
y	2	4	6	8	10

⑥ what if at  $x=20$ ,  $f(x)=7$ , would there be an inverse function then?

It wouldn't be an inverse function then.