

1.7 p83

$$\text{bl. } N(T) = 25T^2 - 50T + 300$$

$$T(t) = 2t + 1$$

$$\begin{aligned} N(T(t)) &= 25(2t+1)^2 - 50(2t+1) + 300 \\ &= 25(4t^2 + 4t + 1) - 100t - 50 + 300 \\ &= 100t^2 + 100t + 25 - 100t - 50 + 300 \end{aligned}$$

$$N(T(t)) = 100t^2 + 275$$

$$750 = 100t^2 + 275$$

$$\frac{475}{100} = \frac{100t^2}{100}$$

$$\sqrt{4.75} = \sqrt{t^2}$$

$$2.18 \approx t$$

2.18 hours

1.8 Inverses

Original $\{ (2, 1) (3, 5) (4, 9) (5, 13) \}$

Inverse $\{ (1, 2) (5, 3) (9, 4) (13, 5) \}$

Switch
x's & y's

$$f(x) = x + 4$$

① Write as an equation

$$y = x + 4$$

② Switch $x \leftrightarrow y$

$$x = y + 4$$

③ Solve for y

$$x - 4 = y + 4 - 4$$

$$x - 4 = y$$

$$y = x - 4$$

④ Write as a function

$$f^{-1}(x) = x - 4$$

$$\frac{a^{-1}}{a^{-1}}$$

$$f(x) = x + 4$$

$$f^{-1}(x) = x - 4$$

$$\cancel{x} + 4$$

$$(f \circ f^{-1})(x) = x - 4 + 4$$

$$(f \circ f^{-1})(x) = x$$

$$\cancel{x} - 4$$

$$(f^{-1} \circ f)(x) = x + 4 - 4$$

$$(f^{-1} \circ f)(x) = x$$

$$f(x) = \sqrt{x-4}$$

$$y = \sqrt{x-4}$$

$$x = \sqrt{y-4}$$

$$(x)^2 = (\sqrt{y-4})^2$$

$$x^2 + 4 = y - 4$$

$$x^2 + 4 = y$$

$$y = x^2 + 4$$

$$f^{-1}(x) = x^2 + 4$$

Equation
y =

Switch
x ↔ y

Solve for y
y =

Write as
function
 $f^{-1}(x)$

$$f(x) = \sqrt{x-4}$$

$$f^{-1}(x) = x^2 + 4$$

$$(f \circ f^{-1})(x) = \sqrt{x^2 + 4 - 4}$$

$$\sqrt{x-4}$$

$$(f \circ f^{-1})(x) = \sqrt{x^2}$$

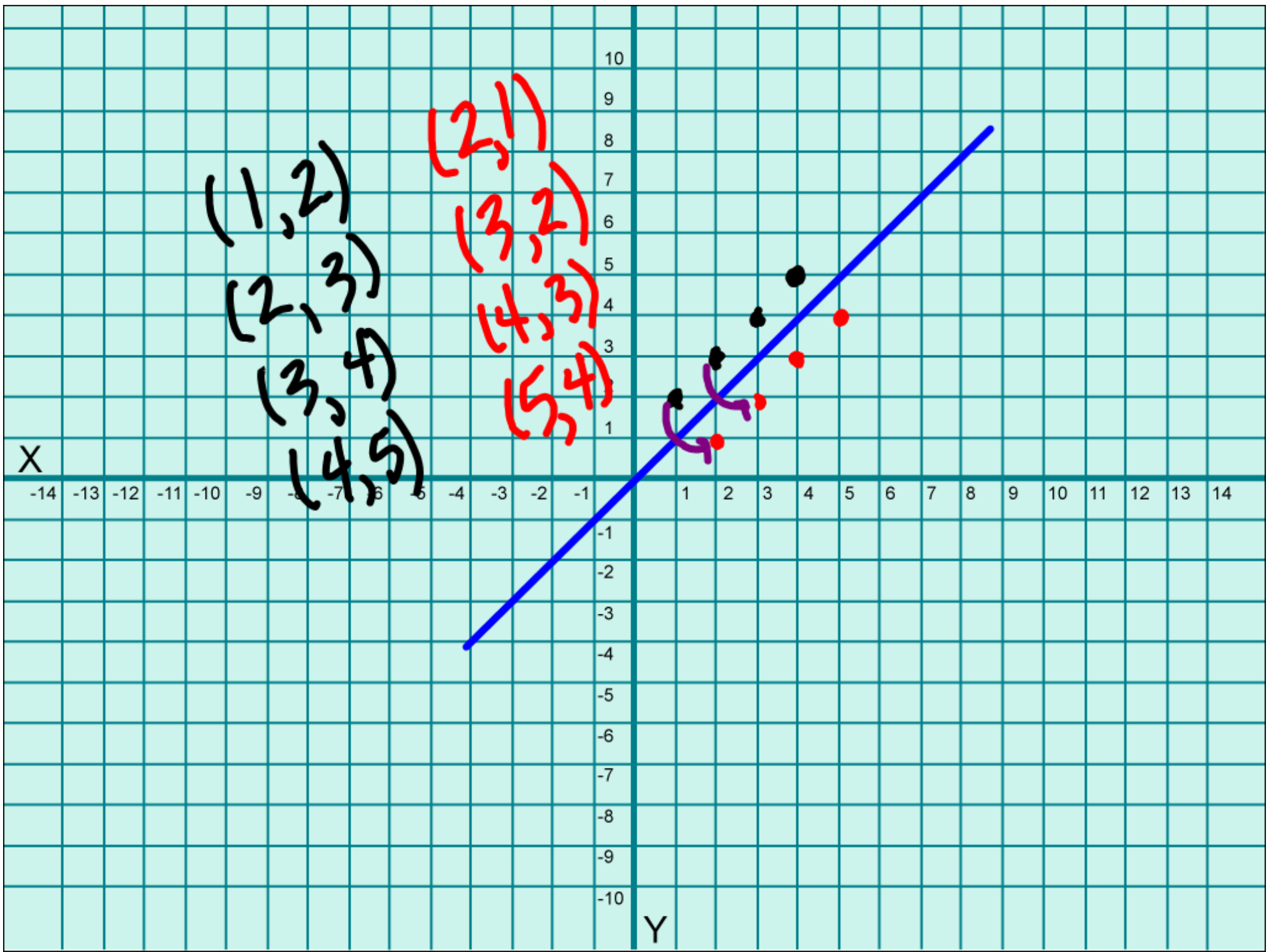
$$(f \circ f^{-1})(x) = x$$

$$(f^{-1} \circ f)(x) = (\sqrt{x-4})^2 + 4$$

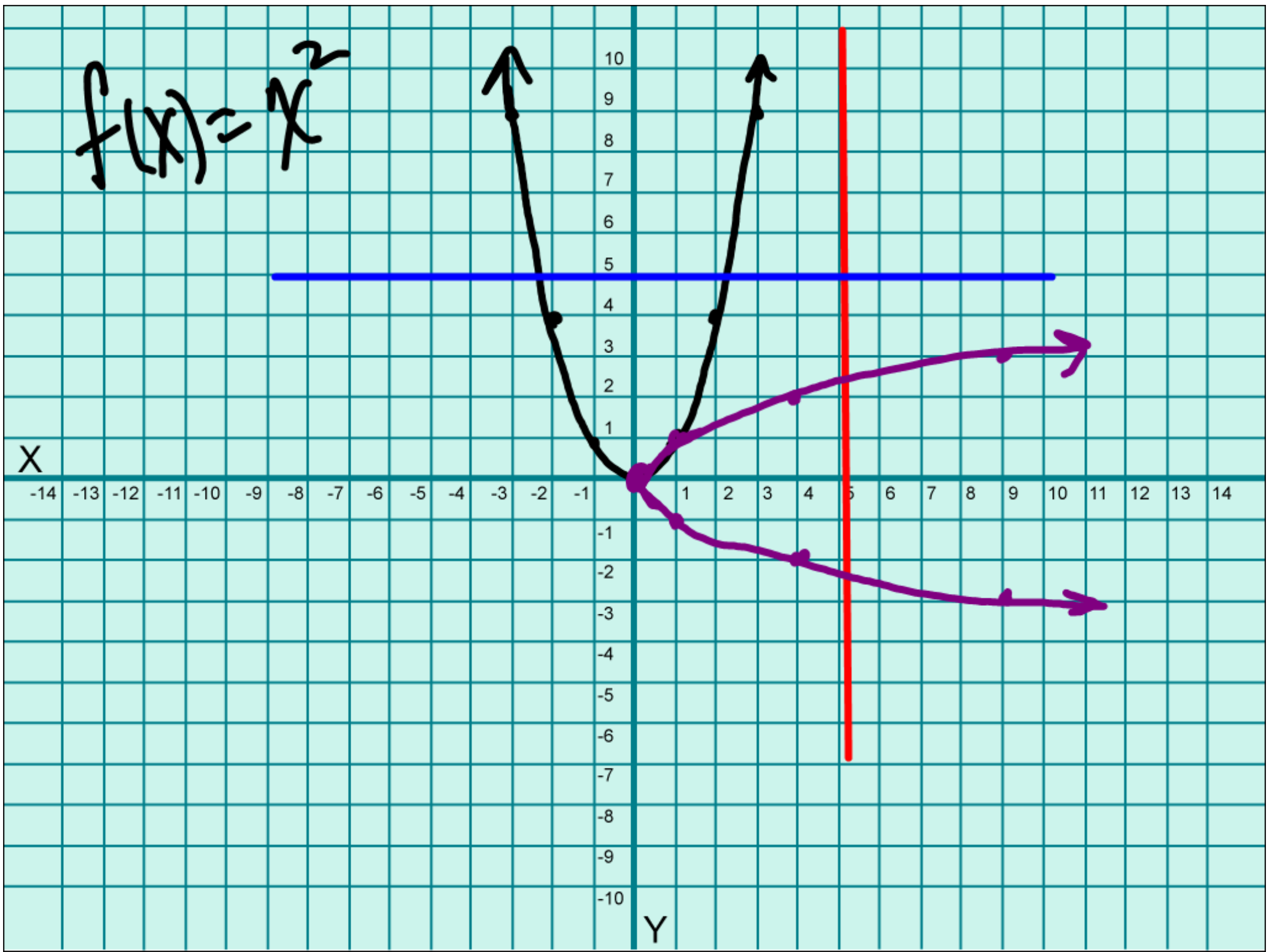
$$x^2 + 4$$

$$(f^{-1} \circ f)(x) = x - 4 + 4$$

$$(f^{-1} \circ f)(x) = x$$



$$f(x) = x^2$$



$$f(x) = x^2$$

is inverse
a function

X

-14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10 11 12 13 14

10
9
8
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10

Y

No Horizontal Line Test

$$f^{-1} \circ g^{-1}$$

$$(f \circ g)^{-1}$$