

Unit 3 lesson 3

Pg. 189 # 1, 2, 3, 4 ii, 5 (no check), 7, (0, 14b)
 Pg 190 → # 4 i, 15, 16, 13, 17 pg ④ →

- a) $y = f(x) + 5$
 $f(x)$ shifted up 5
- b) $y = f(x) - 6$
 $f(x)$ shifted down 6
- c) $y = f(x - 4)$
 $f(x)$ shifted right 4
- d) $y = f(x + 8)$
 $f(x)$ shifted left 8.
- e) $y - 3 = f(x)$
 $y = f(x) + 3$
 $f(x)$ shifted up 3
- f) $y + 7 = f(x)$
 $y = f(x) - 7$
 $f(x)$ shifted down 7
- g) $y = f(x + 3) - 5$
 $f(x)$ shifted left 3,
 down 5.
- h) $y = f(x - 6) + 2$
 $f(x)$ shifted right 6,
 up 2.
- i) $y = f(x - 5) - 7$
 $f(x)$ shifted right 5,
 down 7
- j) $y = f(x + 2) + 9$
 $f(x)$ shifted left 2,
 up 9.

2. a) transformation	function notation	values of h, k
a) 6 units up	$y = f(x) + 6$	$h = 0, k = 6$
b) 8 units down	$y = f(x) - 8$	$h = 0, k = -8$
c) 3 units right	$y = f(x - 3)$	$h = 3, k = 0$
d) 5 units left	$y = f(x + 5)$	$h = -5, k = 0$
e) 2 units left, 4 down	$y = f(x + 2) - 4$	$h = -2, k = -4$
f) 7 right, 7 up	$y = f(x - 7) + 7$	$h = 7, k = 7$

3. function

a) $y = x + 2$

Domain

$\{x \in \mathbb{R}\}$

Range

$\{y \in \mathbb{R}\}$

b) $y = x - 4$

$\{x \in \mathbb{R}\}$

$\{y \in \mathbb{R}\}$

c) $y = x^2 - 3$

$\{x \in \mathbb{R}\}$

$\{y \in \mathbb{R} \mid y \geq -3\}$

d) $y = (x - 2)^2$

$\{x \in \mathbb{R}\}$

$\{y \in \mathbb{R}\}$

e) $y = (x + 5)^2 - 1$

$\{x \in \mathbb{R}\}$

$\{y \in \mathbb{R} \mid y \geq -1\}$

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

$x + 1 \geq 0$
 $x \geq -1$

$\{x \in \mathbb{R} \mid x \geq -1\}$

$\{y \in \mathbb{R} \mid y \geq 0\}$

g) $y = \sqrt{x} - 5$

$\{x \in \mathbb{R} \mid x \geq 0\}$

$\{y \in \mathbb{R} \mid y \geq -5\}$

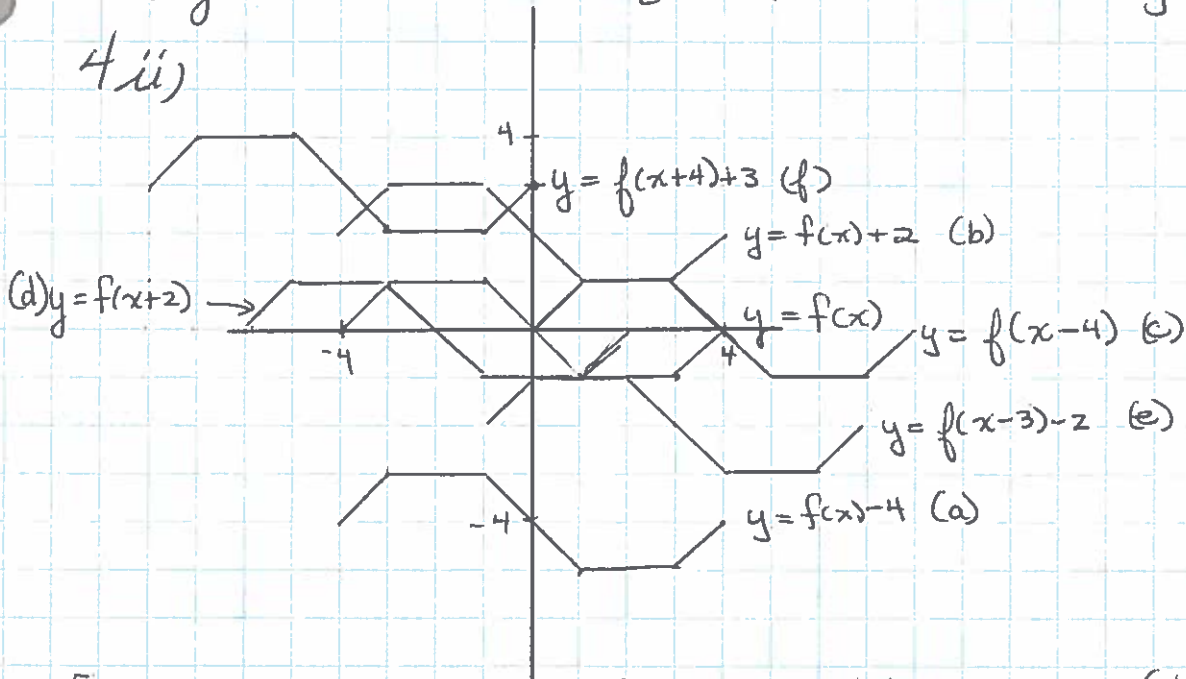
h) $y = \sqrt{x - 3} + 6$

$x - 3 \geq 0$
 $x \geq 3$

$\{x \in \mathbb{R} \mid x \geq 3\}$

$\{y \in \mathbb{R} \mid y \geq 6\}$

4 ii)



5. red graph (given)

blue graph (translation)

a) $y = \sqrt{x}$

down 5

$y = \sqrt{x} - 5$

b) $y = \sqrt{x}$

left 4

$y = \sqrt{x + 4}$

c) $y = \sqrt{x}$

up 4, left 2

$y = \sqrt{x + 2} + 4$

7. a) $y = \sqrt{x} + 7$
up 7

d) $y = \sqrt{x-4}$
right 4

f) $y = \sqrt{x+5} + 4$

b) $y + 3 = \sqrt{x}$

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

c) $y = \sqrt{x+3}$
left 3

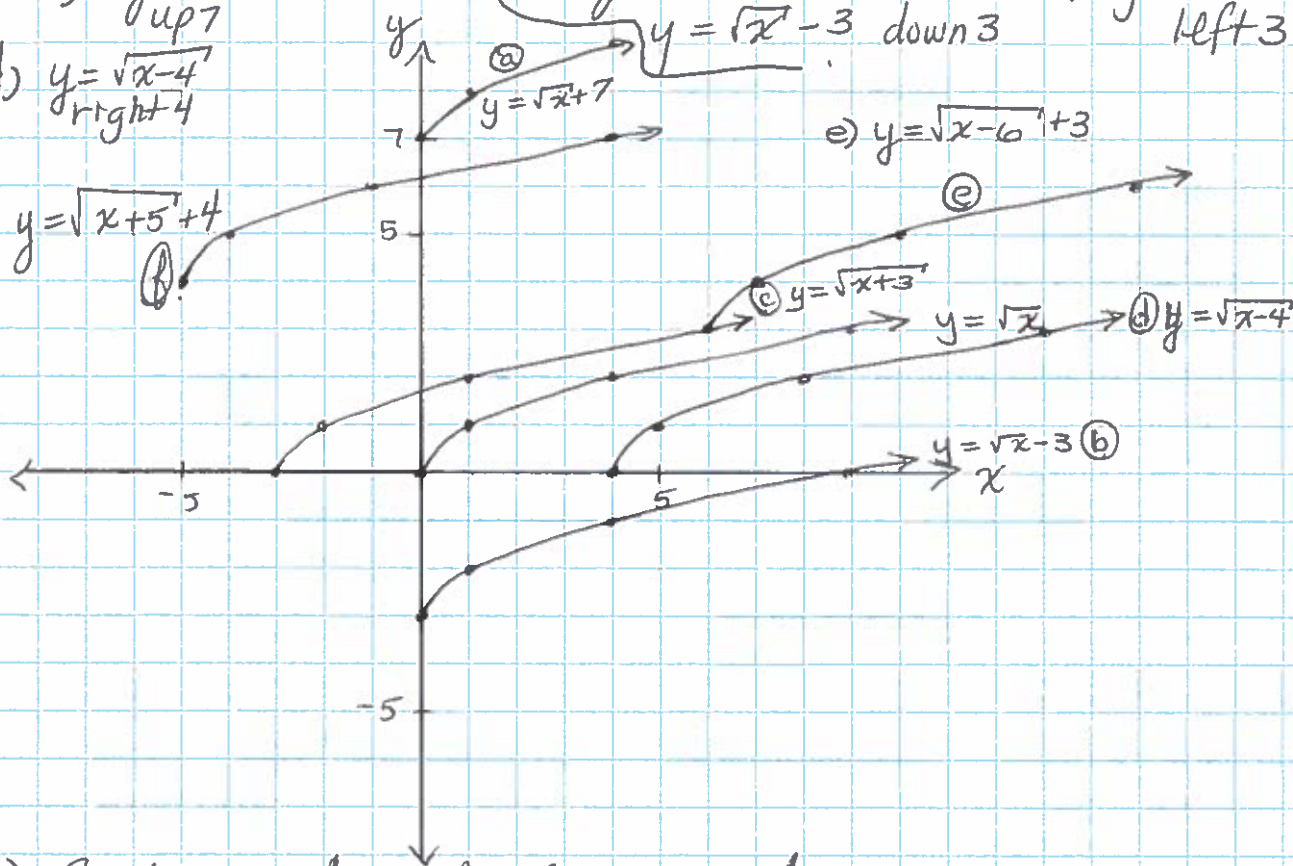
e) $y = \sqrt{x-6} + 3$

c) $y = \sqrt{x+3}$

$y = \sqrt{x}$

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

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



10. a) $E = 45 + 35t$
Let E be Elena's earnings

b) $M = 40 + 35t$
Let M be Mario's earnings.

c) same slope, different y -int

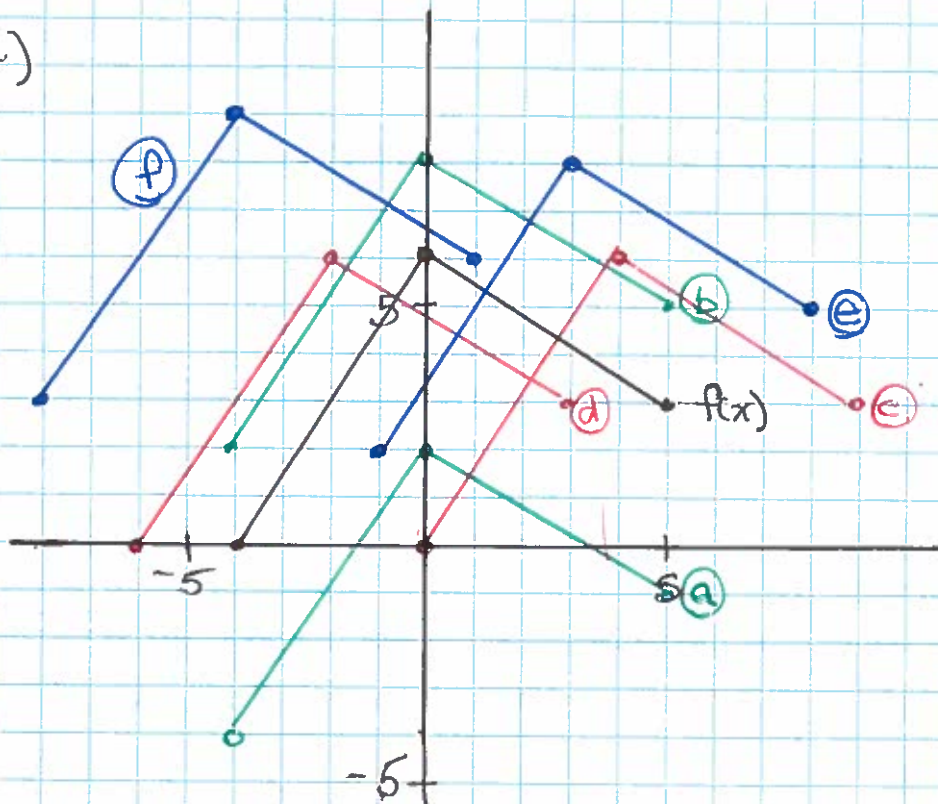
Graph for Elena's earnings is Mario's earnings shifted up 5.

14b) means time 0-59 mins \Rightarrow 0 hrs $x=0$
1hr - 1hr, 59 mins \Rightarrow 1 hr. $x=1$
2hr - 2hr, 59 mins \Rightarrow 2 hr $x=2$
;

$$\begin{array}{l}
 30 \text{ mins } x=0, \quad y = \$5 \\
 1 \text{ hr } x=1, \quad y = \$6 \\
 1 \text{ hr, } 25 \text{ m } x=1, \quad y = \$6 \\
 3 \text{ hr, } 1 \text{ min } x=4, \quad y = 4 + 5 \\
 \quad \quad \quad \quad \quad = \$9
 \end{array}$$

Pg 190 - 192 # 4i, 15, 16, 13, 17.

4i)

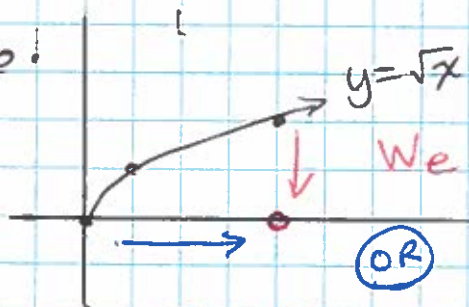


15. ① $y = f(x-4)$ is $f(x)$ shifted right 4

② $y = f(x+3)$ is $f(x)$ shifted left 3

To get from ① to ② you need to shift ① left 7.

16.



We could shift $y = \sqrt{x}$ down 2

OR We could shift $y = \sqrt{x}$ right 4

⊕ There are other possibilities as well.

Pg. 192 #13, 17

13. a) open dots \rightarrow the point is not included

... for example,

$[1.999]$ is 1 since 2 is greater than 1.999

We put an open dot at $(2, 1)$ and a solid dot at 2.

b) $D = \{x \in \mathbb{R}\}$

$\hookrightarrow x$ can be any real number.

$R = \{y \in \mathbb{Z}\}$ or $\{y \in \mathbb{I}\}$

$\hookrightarrow y$ is any integer.

