

Are there any Homework Questions you would like to see on the board?

Last day's work: pp. 76-77 #1 – 5, 7, 8, 10, 12* – 19
*use web fix

Be ready for Unit 2 Summative Tomorrow!!

15
8ab
12b

p. 76 #5ac

5. a) Graph the function $f(x) = -2(x - 3)^2 + 4$, and state its domain and range.

b) What does $f(1)$ represent on the graph?

Indicate, on the graph, how you would find

$f(x)$ $f(1)$.

c) Use the equation to determine each of the following.

i) $f(3) - f(2)$

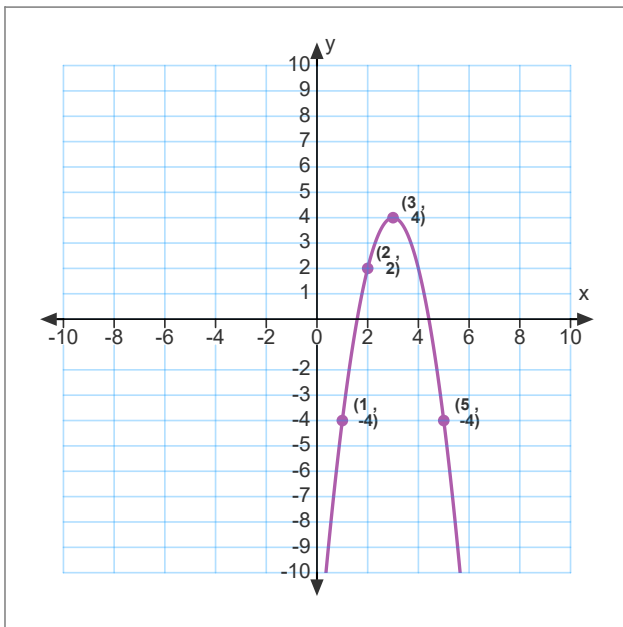
iii) $f(1 - x)$

ii) $2f(5) + 7$

$f(3) = 4$
 $\therefore (3, 4)$

$f(2) = 2$ $D = \{x \in \mathbb{R}\}$

$R = \{y \in \mathbb{R} \mid y \leq 4\}$



(i) $f(3) - f(2)$

$= 4 - 2$

$= 2$

(ii) $2f(5) + 7$

$= 2(-4) + 7$

$= -8 + 7$
 $= -1$

(iii) $f(1-x) = -2((1-x)-3)^2 + 4$

$= -2(-x-2)^2 + 4$

$= -2(x^2 + 4x + 4) + 4$

$= -2x^2 - 8x - 8 + 4$

$= -2x^2 - 8x - 4$

p. 76 #8b

8a

$\mathbb{R} + \mathbb{R}$

$D: \{x \in \mathbb{R} \mid x \geq -2\}$
 $R: \{y \in \mathbb{R} \mid y \geq 3\}$

8. State the domain and range of each function.

a) $f(x) = 2(x - 1)^2 + 3$

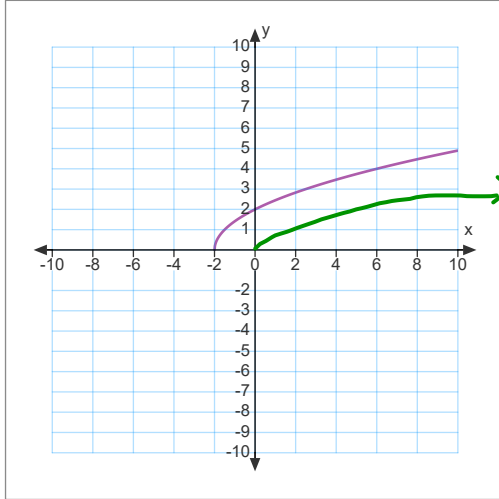
b) $f(x) = \sqrt{2x + 4}$

$= \sqrt{2(x+2)}$

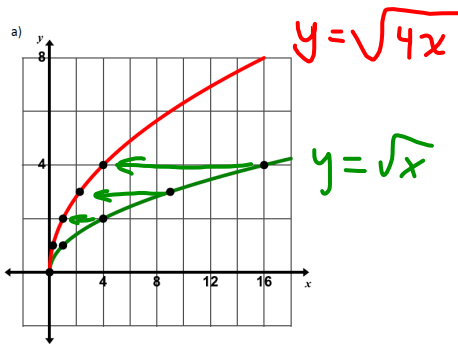
$y = \sqrt{2x+4}$

$D: \{x \in \mathbb{R} \mid x \geq -2\}$

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



p. 76 #12a see webfix

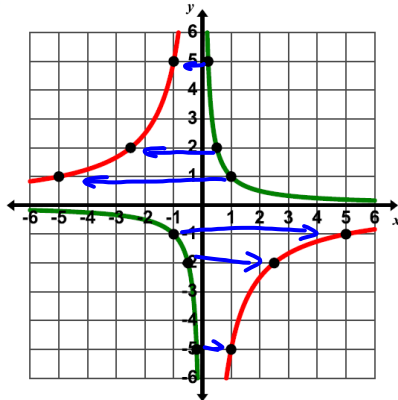


$y = \frac{1}{x}$

$f(kx)$

reflection in y-axis
 $\therefore k$ is -ve.

b)



$(1, 1) \rightarrow (-5, 1)$

$(\frac{1}{5}, 5) \rightarrow (-1, 5)$

has by a factor of 5

$\therefore k = \frac{1}{5}$

$\therefore f(\frac{1}{5}x)$

$y = a f(k(x-d)) + c$

$y = 1 f(\frac{1}{5}(x-0)) + 0$

$= f(\frac{1}{5}x)$

$(x, y) \rightarrow (-5x, y)$

$\therefore y = \frac{1}{(-\frac{1}{5}x)}$

p. 77 #15

Note: The textbook answer is incorrect.#15 $P(1,4)$ on $f(x)$

$$y = 3f[-4(x+1)] - 2$$

$$y = a f(k(x-d)) + c$$

$$(x, y) \rightarrow \left(\frac{1}{k}x + d, ay + c\right)$$

$$\rightarrow \left(-\frac{1}{4}x - 1, 3y - 2\right)$$

$$\rightarrow \left(-\frac{1}{4}(1) - 1, 3(4) - 2\right)$$

$$\rightarrow \left(-\frac{1}{4} - \frac{4}{4}, 12 - 2\right)$$

$$\rightarrow \left(-\frac{5}{4}, 10\right) \text{ or } (-1.25, 10)$$

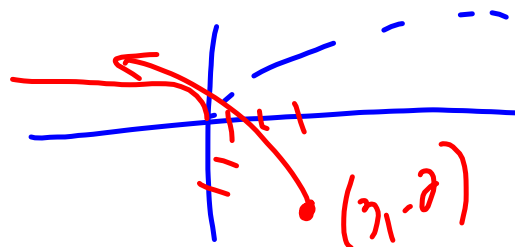
$$\text{or } \left(-1\frac{1}{4}, 10\right)$$

p. 77 #17a

17. In each case, write the equation for the transformed function, sketch its graph, and state its domain and range.

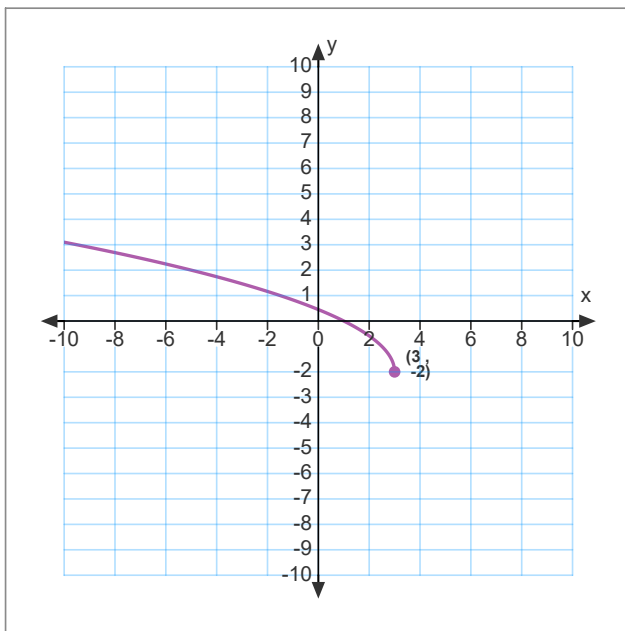
a) The graph of $f(x) = \sqrt{x}$ is compressed horizontally by the factor $\frac{1}{2}$, reflected in the y -axis, and translated 3 units right and 2 units down.

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



$\therefore D: \{x \in \mathbb{R} \mid x \leq 3\}$
 $R: \{y \in \mathbb{R} \mid y \geq -2\}$

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

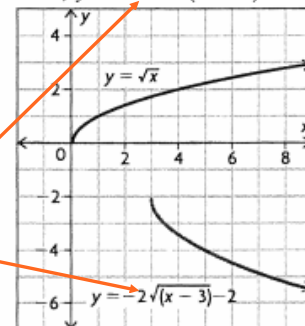


Note: The textbook answer is incorrect.

Their answer is based on incorrectly reflecting in x -axis.

I'm also not sure why $a=2$ in the graph ?

17. a) $y = -2\sqrt{2(x-3)} - 2$



domain = $\{x \in \mathbb{R} \mid x \geq 3\}$,
 range = $\{y \in \mathbb{R} \mid y \leq -2\}$

p. 77 #19

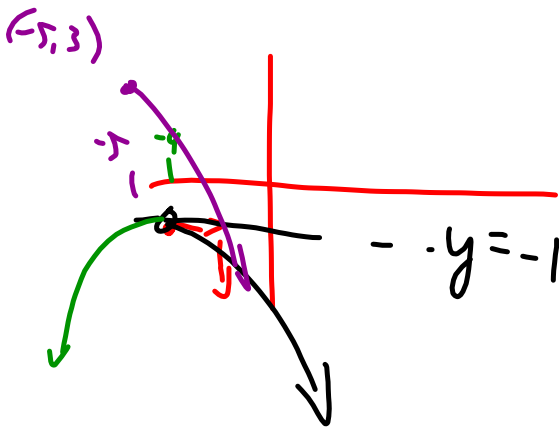
19. A function $f(x)$ has domain $\{x \in \mathbf{R} \mid x \geq -4\}$ and range $\{y \in \mathbf{R} \mid y < -1\}$. Determine the domain and range of each function.

a) $y = 2f(x)$

c) $y = 3f(x + 1) + 4$

b) $y = f(-x)$

d) $y = -2f(-x + 5) + 1$



19. a) This is a vertical stretch by a factor of 2, so it expands the upper bound of the range by a factor of 2.

Domain = $\{x \in \mathbf{R} \mid x \geq -4\}$,

range = $\{y \in \mathbf{R} \mid y < -2\}$

b) This is a reflection in the y -axis, so it will change the sign of the bound of the domain, and the direction of the inequality.

Domain = $\{x \in \mathbf{R} \mid x \leq 4\}$,

range = $\{y \in \mathbf{R} \mid y < -1\}$

c) This is a vertical stretch of 3, followed by translations of left 1 unit and up 4 units.

Domain = $\{x \in \mathbf{R} \mid x \geq -5\}$,

range = $\{y \in \mathbf{R} \mid y < 1\}$

d) First, rewrite the equation

$y = -2f(-x - 5) + 1$. This is a reflection in both the x - and y -axes, so it will change the signs of the bounds of the domain and range, and the direction of their inequalities. There is also a vertical stretch by a factor of 2, followed by translations of 5 right and 1 up.

Domain = $\{x \in \mathbf{R} \mid x \leq -1\}$,

range = $\{y \in \mathbf{R} \mid y > 3\}$