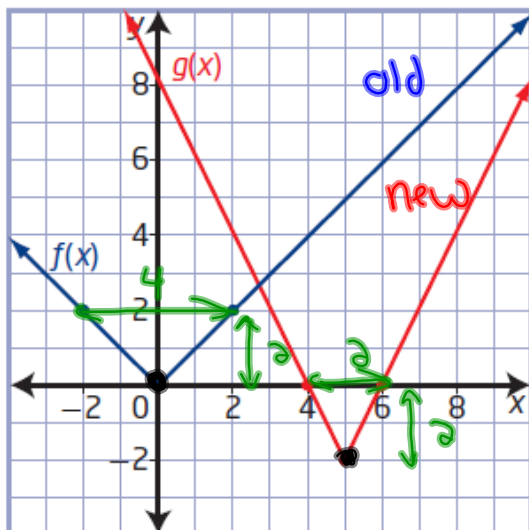


Review

11. Write the equation for the graph of $g(x)$ as a transformation of the equation for the graph of $f(x)$.



① Reflections: None

② VSF = $\frac{2}{2} = 1$ ($a=1$)

③ HSF = $\frac{2}{4} = \frac{1}{2}$ ($b=2$)

④ HT: $(\underline{0}, \underline{0}) \rightarrow (\underline{5}, \underline{-2})$ ($h=5$)

⑤ VT: $(\underline{0}, \underline{0}) \rightarrow (\underline{5}, \underline{-2})$ ($k=-2$)

⑥ $y = |f[\underline{2}(x-\underline{5})] - \underline{2}|$

7. Describe, using an appropriate order, how to obtain the graph of each function from the graph of $y = f(x)$. Then, give the mapping for the transformation.

$$3y - 6 = f(-2x + 12)$$

$$3y - 6 = f[-2(x - 6)]$$

$$\frac{3y}{3} = \frac{1}{3}f[-2(x - 6)] + \frac{6}{3}$$

$$y = \frac{1}{3}f[-2(x - 6)] + 2$$

$$a = \frac{1}{3}$$

$$b = -2$$

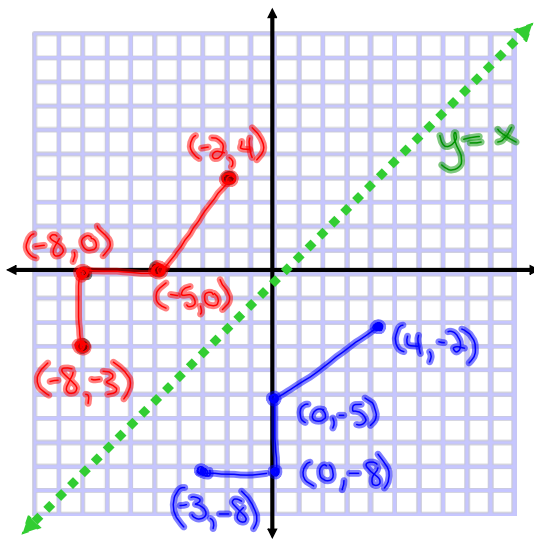
$$h = 6$$

$$k = 2$$

reflection in the y -axis, horizontal stretch by a factor of $\frac{1}{2}$, vertical stretch by a factor of $\frac{1}{3}$, and translation of 6 units right and 2 units up;

$$(x, y) \rightarrow \left(-\frac{1}{2}x + 6, \frac{1}{3}y + 2\right)$$

Inverse Relations



a) Sketch the Inverse

b) Is the Inverse a function?

Neither the relation or its inverse are functions

a) Determine the Inverse of $f(x) = 3\sqrt{x-5} + 8$

① $y = 3\sqrt{x-5} + 8$

② $x = 3\sqrt{y-5} + 8$

③ $x-8 = 3\sqrt{y-5}$

$\frac{1}{3}(x-8) = \sqrt{y-5}$

$\frac{1}{9}(x-8)^2 = y-5$

$\frac{1}{9}(x-8)^2 + 5 = y$

$y = \frac{1}{9}(x-8)^2 + 5$

④ $f^{-1}(x) = \frac{1}{9}(x-8)^2 + 5$

b) State the domain of $f(x)$ and $f^{-1}(x)$

$f(x) = 3\sqrt{x-5} + 8$
 $a=3 \quad b=1 \quad h=5 \quad k=8$

$D: \{x | x \geq 5, x \in \mathbb{R}\}$

$R: \{y | y \geq 8, y \in \mathbb{R}\}$

$f^{-1}(x) = \frac{1}{9}(x-8)^2 + 5$

$D: \{x | x \geq 8, x \in \mathbb{R}\}$

$R: \{y | y \geq 5, y \in \mathbb{R}\}$

Homework

Chapter Review from textbook...

Pages 56-57

#2, 3, 6, 9, 10, 11, 14, 15, 16

Practice Test

Pages 58-59

All questions

Unit Test:

- Function notation
- combinations:
- compositions:
- catalogue of essential functions
- transformations:

↳ Reflections, Stretches, Translations

↳ $y = a f(b(x-h)) + k$ ← vertical translation shift up/down

• vertical stretch by a factor of a

• if $a < 0$ reflect in x-axis

• horizontal stretch by a factor of $\frac{1}{|b|}$

• if $b < 0$ reflect in y-axis

• horizontal translation shift left/right

- Mapping:

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

⇒ Inverse Functions

- Switch "x" & "y" (Domain & Range)
- Sketch Inverses from a given graph
(Reflects in line $y=x$)
- One-one function (Horizontal line)
- Switch to inverse algebraically

ie. $f(x) = x + 7$

$$x = y + 7$$

$$x - 7 = y$$

$$f^{-1}(x) = x - 7$$