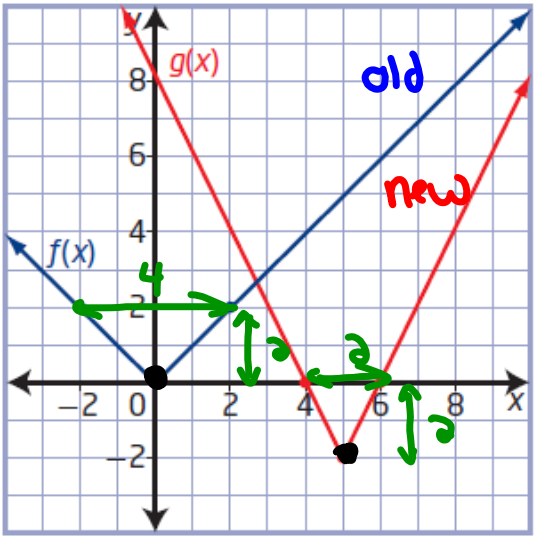
# Review

**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: $(0,0) \rightarrow (5,-2)$ $(h=5)$

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

⑥ $y = 1f[2(x-5)]-2$

**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.

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

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

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

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

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

$b = -2$

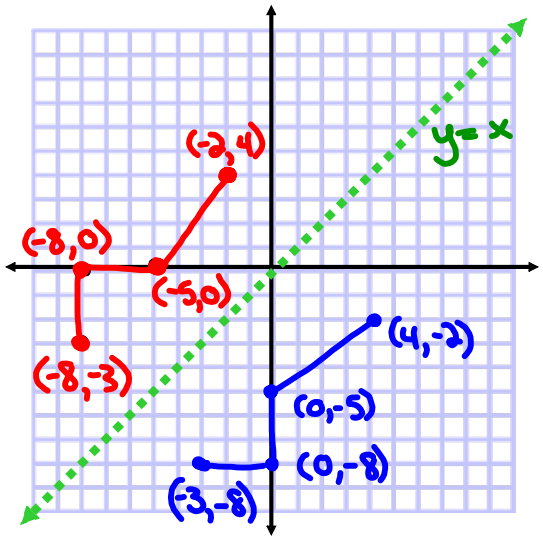
$h = 6$

$k = 2$

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 it 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: $\{x \mid x \geq 5, x \in R\}$

R: $\{y \mid y \geq 8, y \in R\}$

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

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

R: $\{y \mid y \geq 5, y \in R\}$

# Homework

Finish Chapter 1 Review

Extra questions from textbook...

Pages 56-57
#2, 3, 6, 9, 10, 11, 14, 15, 16

Practice Test Pages 58-59
All questions

1. Write the equation of the transformed function as well as a mapping rule for each of the following:

a) The base function $f(x)$ is reflected in the y-axis, stretched horizontally by a factor of 6, compressed vertically by a factor of $\frac{1}{2}$, translated 4 units to the left and 1 unit down. $b<0$

HSF = 6 $b=-\frac{1}{6}$

VSF = $\frac{1}{2}$ $a=\frac{1}{2}$

HT = 4 left $h=-4$

VT = 1 down $K=-1$

(i) $y=\frac{1}{2}f\left[-\frac{1}{6}(x+4)\right]-1$

(ii) $(x,y)\rightarrow\left[-6x-4,\frac{1}{2}y-1\right]$

b) The base function $f(x)$ is compressed horizontally by a factor of $\frac{1}{3}$, stretched vertically by a factor of 3, translated 5 units to the right and 4 units up.

HSF = $\frac{1}{3}$ $b=3$

VSF = 3 $a=3$

HT = 5 right $h=5$

VT = 4 up $K=4$

(i) $y=3f[3(x-5)]+4$

(ii) $(x,y)\rightarrow\left[\frac{1}{3}x+5,3y+4\right]$

c) The base function $f(x)$ is reflected in both the x and y-axis, stretched horizontally by a factor of 4, translated 3 units to the left and 7 units up. $a<0$ & $b<0$

HSF = 4 $b=-\frac{1}{4}$

VSF = 1 $a=-1$

HT = 3 left $h=-3$

VT = 7 up $K=7$

(i) $y=-f\left[-\frac{1}{4}(x+3)\right]+7$

(ii) $(x,y)\rightarrow[-4x-3,-y+7]$

2. Given that $3y-2=-6f(2x-10)+7$, complete the chart shown below. When identifying translations be sure that you indicate both the number of units and direction of the shift.

$\frac{3y}{3} = \frac{-6f(2x-10)}{3} + \frac{9}{3}$

$y = -2f(2x-10)+3$

$y = -2f[2(x-5)]+3$

$a=-2 \rightarrow$ VSF = 2 (reflected in x-axis)

$b=2 \rightarrow$ HSF = $\frac{1}{2}$

$h=5 \rightarrow$ HT = 5 right

$k=3 \rightarrow$ VT = 3 up

| | |
|---|---|
| Reflected in $x$-axis | YES or NO (circle correct solution) |
| Reflected in $y$-axis | YES or NO (circle correct solution) |
| Horizontal translation of… | 5 units right |
| Vertical translation of… | 3 units up |
| Horizontally stretched by a factor of… | $\frac{1}{2}$ |
| Vertically stretched by a factor of … | 2 |
| Write a mapping rule for the function | $(x,y) \rightarrow [\frac{1}{2}x+5, -2y+3]$ |
| Transform the point (3, 2) | $(3,2) \rightarrow (\frac{13}{2}, -1)$ |

$\frac{1}{2}(3)+5$

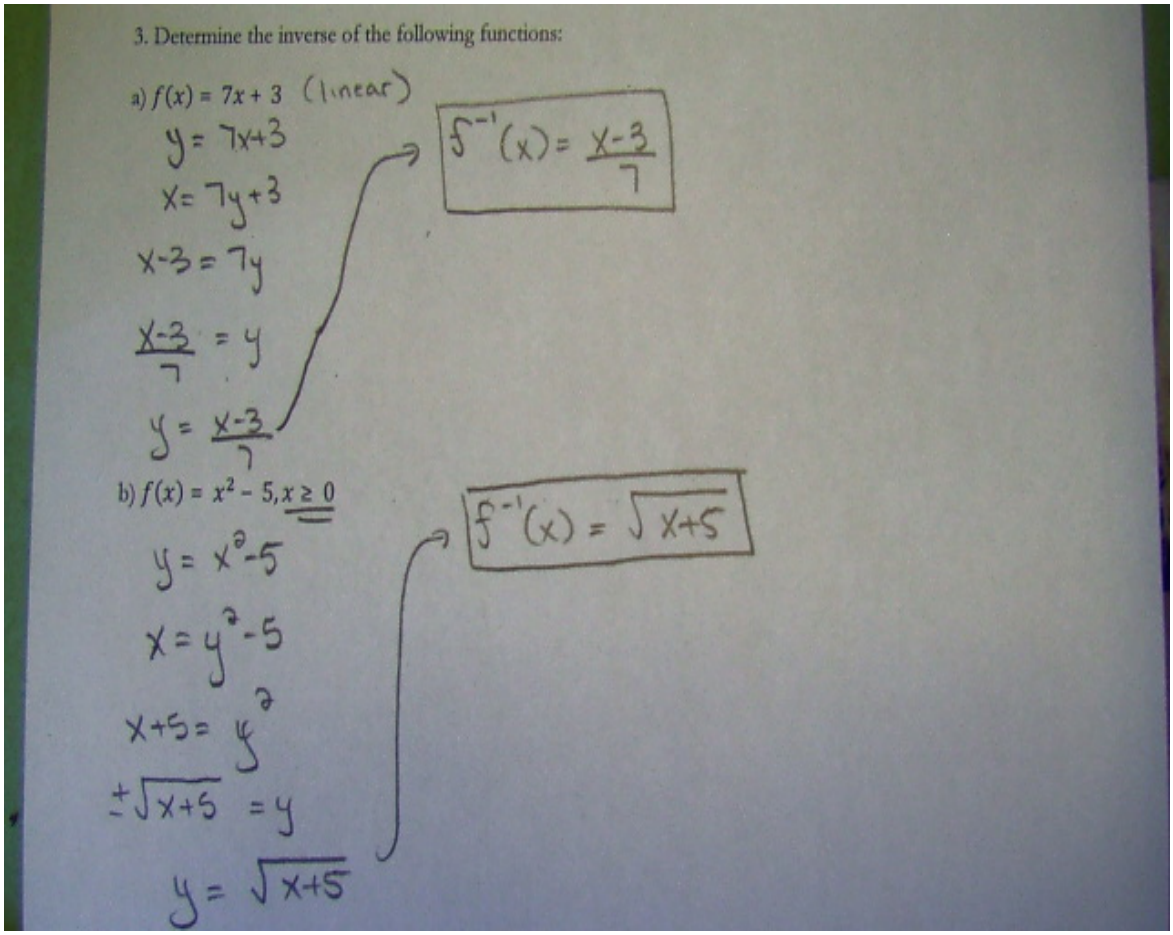
$\frac{3}{2}+\frac{5}{1}$

$\frac{3}{2}+\frac{10}{2}=\frac{13}{2}$

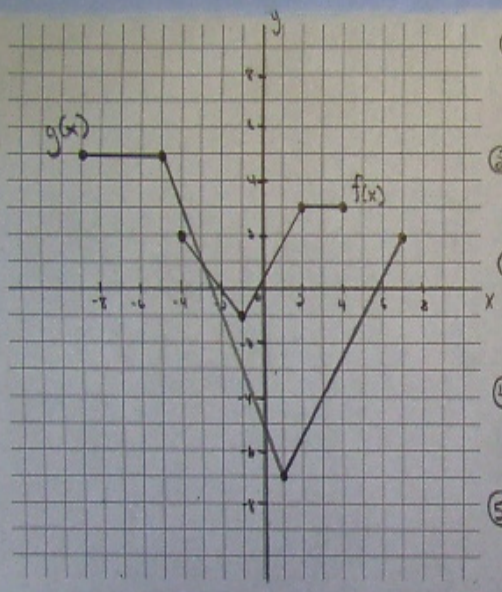
$-2(2)+3$

$-4+3$

$-1$


3. Determine the inverse of the following functions:
a) $f(x) = 7x + 3$ (linear)
$y = 7x+3$
$x = 7y+3$
$x-3 = 7y$
$\frac{x-3}{7} = y$
$y = \frac{x-3}{7}$
$f^{-1}(x) = \frac{x-3}{7}$
b) $f(x) = x^2 - 5, x \geq 0$
$y = x^2-5$
$x = y^2-5$
$x+5 = y^2$
$\pm\sqrt{x+5} = y$
$y = \sqrt{x+5}$
$f^{-1}(x) = \sqrt{x+5}$

4. Given the graphs of $y = f(x)$ and $y = g(x)$, what is the equation for $g(x)$ in terms of $f(x)$?




① Reflection: horizontal in the y-axis ($b<0$)

② VSF $= \frac{12}{4} = 3$ $a = 3$

③ HSF $= \frac{16}{8} = 2$ $b = -\frac{1}{2}$

④ HT: $(-1,-1) \rightarrow (1,-7)$

$-2(-1) + \underline{(-1)} = 1$ $h = -1$

⑤ VT: $(-1,-1) \rightarrow (1,-7)$

$3(-1) + \underline{(-4)} = -7$ $K = -4$

⑥ Equation:

$g(x) = 3f[-\frac{1}{2}(x+1)] - 4$