

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

Last day's work: pp. 46-49 #2 - 4, (5 - 7)ace, 12

[19, 20]

4db
3a

Today's Homework Practice includes:

pp. 76-77 #1 - 5, 7, 8, 10, 12* - 19

*use web fix

p. 47 #3a

3. Determine whether each pair of functions described in words are inverses.

a) f : Multiply by 3, then add 1; g : Divide by 3, then subtract 1.

$$f(x) = 3x + 1$$

$$g(x) = \frac{x}{3} - 1$$

$$x = 3y + 1$$

$$= \frac{x}{3} - \frac{3}{3}$$

$$x - 1 = 3y$$

$$= \frac{x-3}{3}$$

$$\frac{x-1}{3} = y$$

4. For each linear function, interchange x and y . Then solve for y to determine the inverse.

a) $y = 4x - 3$

c) $3x + 4y = 6$

b) $y = 2 - \frac{1}{2}x$

d) $2y - 10 = 5x$

p. 47 #4b

$$x = 2 - \frac{1}{2}y$$

$$\left(\frac{1}{2}y\right) = (-x + 2)$$

$$y = -2x + 4$$

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

p. 47 #4d

$$2x - 10 = 5y$$

$$\frac{2x}{5} - \frac{10}{5} = y$$

$$y = \frac{2}{5}x - 2$$

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

$$f(x) = a f(\underbrace{k(x-d)}_{\text{backwards}}) + c$$

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

$$\text{ex) } f(x) = -2(3(x-4))^2 + 7$$

$$\therefore (x, y) \rightarrow \left(\frac{1}{3}x + 4, -2y + 7\right)$$

Review for Chapter 1 - Introduction to Functions

1. Describe the transformations to $f(x)$

$$g(x) = \underset{-}{-}3f\left(\frac{1}{\underset{-}{2}}(x-\underset{-}{2})\right) \underset{-}{+}4$$

$$k = \frac{1}{2}$$

$$\therefore \frac{1}{k} = 2$$

reflection in the x-axis

V.S. by a factor of 3

h.S. by a factor of 2

h.t. 2 units right

v.t. 4 units up

2. a) Write an equation using the **square root** mother function for the following transformations:

-Vertical compression by a factor of $\frac{1}{3}$

-Horizontal stretch by a factor of 2

-Reflection over the y-axis

-Translated vertically up 5

-Translated horizontally left 4

$$f(x) = \frac{1}{3} \sqrt{-\frac{1}{2}(x+4)} + 5$$

b) Write an equation for the above transformations if the mother function is the reciprocal function.

$$g(x) = \frac{\frac{1}{3}}{\frac{1}{2}(x+4)} + 5$$

3. If $(-2, 5)$ is a point on the function, determine the coordinates of the image of this point on the graph.

$$f(x) = -2f\left(\frac{1}{3}(x-4)\right) + 6$$

$$(x, y) \rightarrow (3x+4, -2y+6)$$

$$(-2, 5) \rightarrow (3(-2)+4, -2(5)+6)$$

$$\rightarrow (-6+4, -10+6)$$

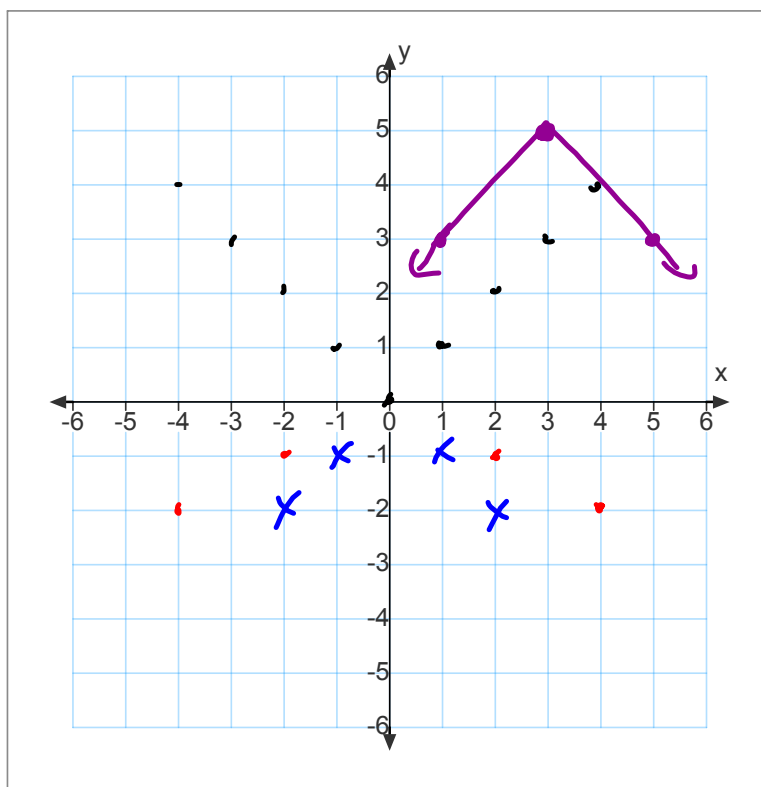
$$\rightarrow (-2, -4)$$

4. Graph each of the following functions and determine the domain and range.

$$\begin{aligned} \text{a) } y &= -\frac{1}{2}|2x-6|+5 \\ &= -\frac{1}{2}|2(x-3)|+5 \end{aligned}$$

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

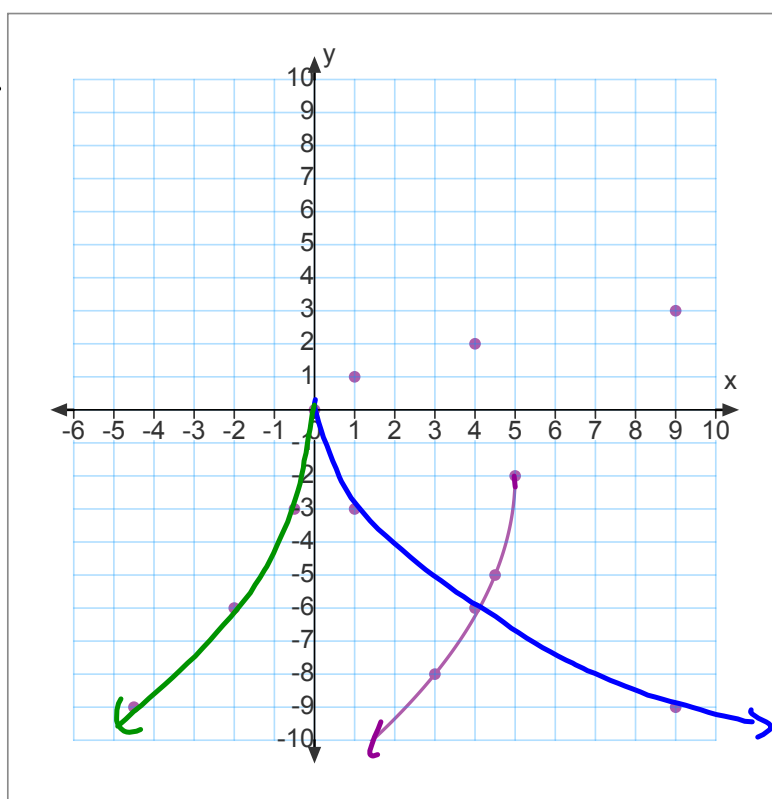
$$R: \{y \in \mathbb{R} \mid y \leq 5\}$$



b) $f(x) = -3\sqrt{-2x+10} - 2$

$$y = -3\sqrt{-2x+10} - 2$$

$$= -3\sqrt{-2(x-5)} - 2$$



c)

$$y = -\frac{2}{x-4} - 3$$



5. If $f(x) = 3x - 5$ and $g(x) = 2x^2 - 5$

Determine each of the following:

$$\begin{aligned} \text{a) } f(-2) &= 3(-2) - 5 \\ &= -6 - 5 \\ &= -11 \end{aligned}$$

$$\begin{aligned} \text{b) } f(2) + g(-2) &= [3(2) - 5] + [2(-2)^2 - 5] \\ &= [6 - 5] + [2(4) - 5] \\ &= 1 + 3 \\ &= 4 \end{aligned}$$

$$\begin{aligned} \text{c) } g(x-3) &= 2(x-3)^2 - 5 \\ &= 2(x^2 - 6x + 9) - 5 \\ &= 2x^2 - 12x + 18 - 5 \\ &= 2x^2 - 12x + 13 \end{aligned}$$

$$\begin{aligned} \text{d) } f(x) &= -3 \\ -3 &= 3x - 5 \\ -3x &= -5 + 3 \\ -3x &= -2 \\ x &= \frac{2}{3} \end{aligned}$$

6. Determine the inverse of each of the following functions

a) $f(x) = 4x - 5$

$$x = 4y - 5$$

$$x + 5 = 4y$$

$$y = \frac{x+5}{4}$$

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

b) $\{(-5, 3), (2, 4), (6, -1), (-2, 8)\}$

inverse: $\{(3, -5), (4, 2), (-1, 6), (8, -2)\}$

c) $y = -3(x-5)^2 + 8$

$$x = -3(y-5)^2 + 8$$

$$x - 8 = -3(y-5)^2$$

$$\frac{x-8}{-3} = (y-5)^2$$

$$\pm \sqrt{\frac{x-8}{-3}} = y-5$$

$$\therefore y = \pm \sqrt{\frac{x-8}{-3}} + 5$$

Not $f^{-1}(x)$!!!

d) $f(x) = -2\sqrt{3x-6} + 5$

$$x = -2\sqrt{3y-6} + 5$$

$$x - 5 = -2\sqrt{3y-6}$$

$$\frac{x-5}{-2} = \sqrt{3y-6}$$

$$\left(\frac{x-5}{-2}\right)^2 = 3y-6$$

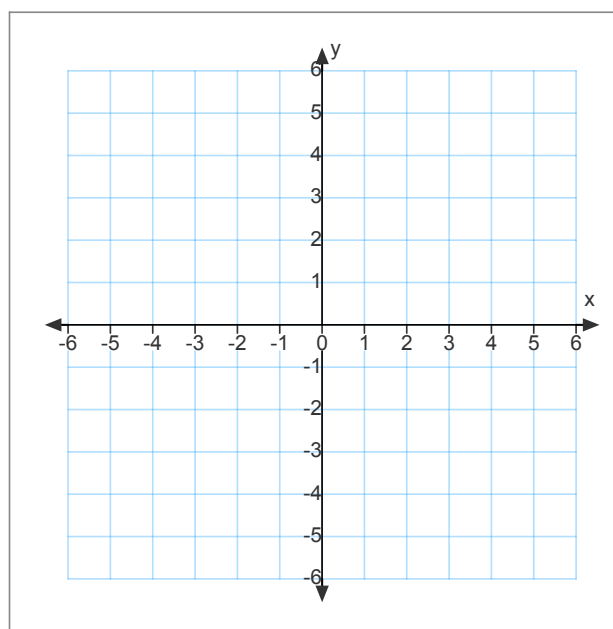
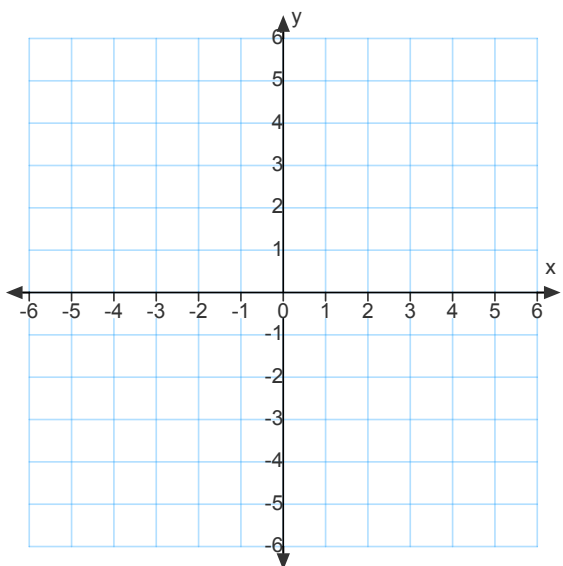
$$\left(\frac{x-5}{-2}\right)^2 + 6 = 3y$$

$$y = \frac{\left(\frac{x-5}{-2}\right)^2 + 6}{3}$$

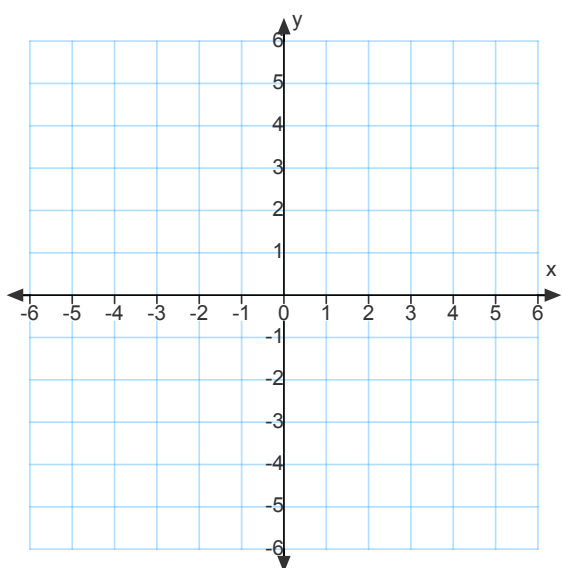
7. Graph each of the original functions and their inverses from #6

a) $f(x) = 4x - 5$

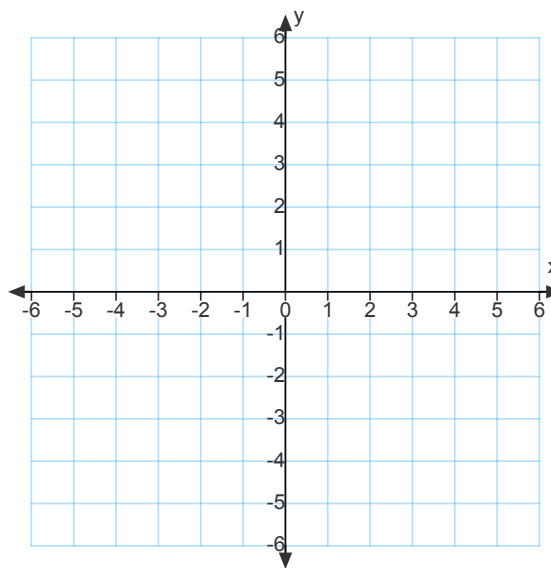
b) $\{(-5,3), (2,4), (6,-1), (-2,8)\}$



c) $y = -3(x - 5)^2 + 8$

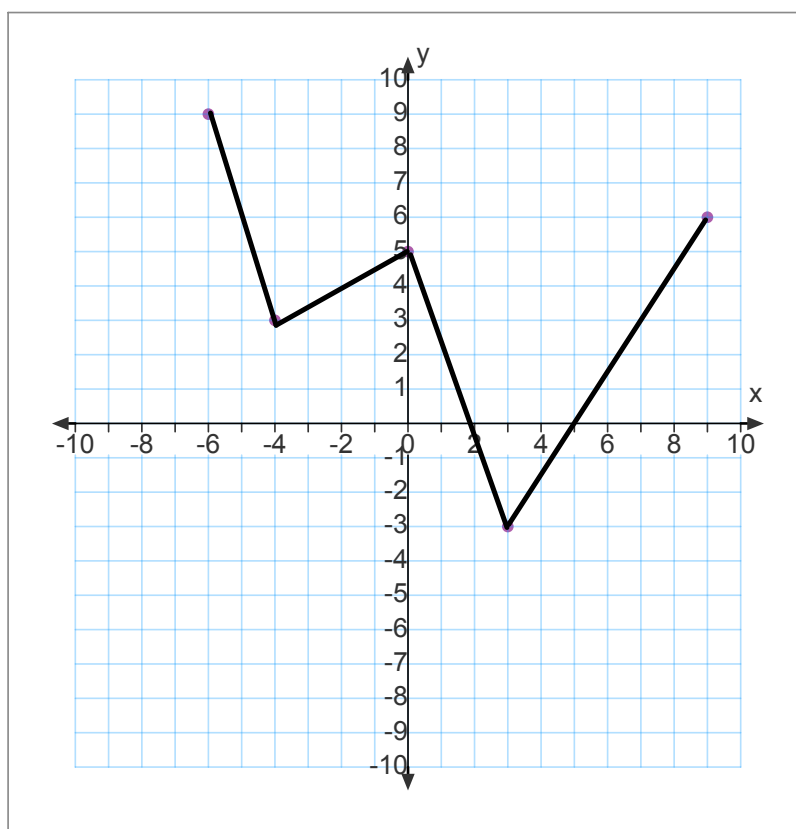


d) $f(x) = -2\sqrt{3x - 6} + 5$



8. Determine the domain and range of each inverse function above.

9. Given $f(x)$, graph $f(-2x)$.



10. Determine the domain and range of each function in all the questions above.

11. Be able to identify what are functions and WHY - just like quiz

Go over old quizzes and homework