

Chapter 1 and 2 Assignment

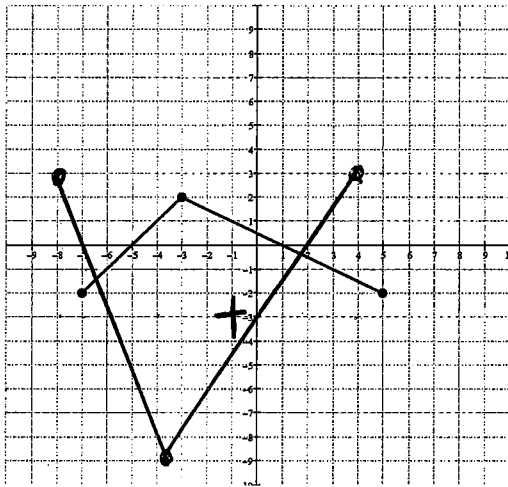
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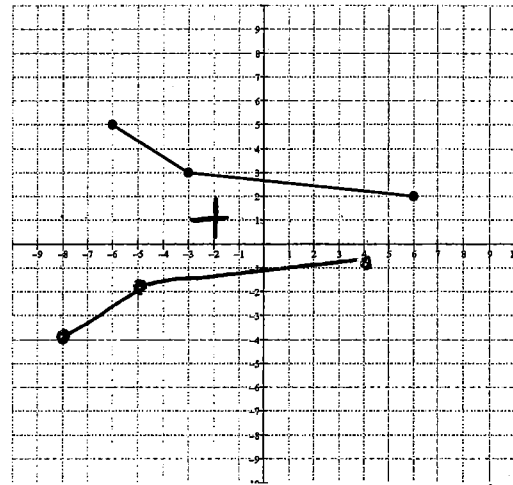
1. Sketch the graph of the indicated transformation for each function.

old	
-7	-2
-3	2
5	-2
new	
-7	6
-3	-6
5	6

(a) $y = -3f(x+1) - 3$

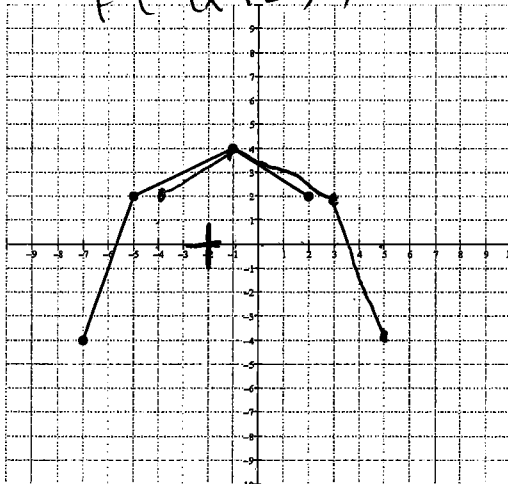


(b) $y = -f(x+2) + 1$

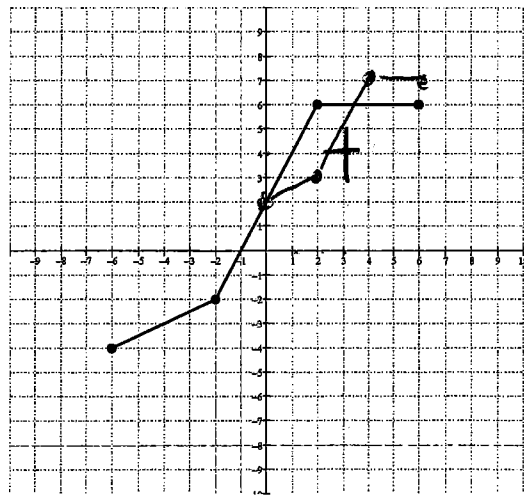


old	
-6	5
-3	3
6	2
new	
-6	-5
-3	3
6	-2

(c) $y = f(-x-2)$
 $f(-(x+2))$



(d) $y = \frac{1}{2}f(2(x-3)) + 4$ $a = \frac{1}{2}$
 $b = 2$



old	
-6	4
-2	2
2	6
6	6
new	
-3	2
-1	1
1	3
3	3

old	
7	4
5	2
1	4
2	2
new	
7	4
5	2
1	4
2	2

2. Given the equation $f(x) = x^2 + 5x - 6$, find the zeros of:

$= (x+6)(x-1)$

(a) $f(\frac{1}{2}x)$

$(-12, 0)$

$(2, 0)$

(b) $3f(2x)$

$(-3, 0)$
 $(\frac{1}{2}, 0)$

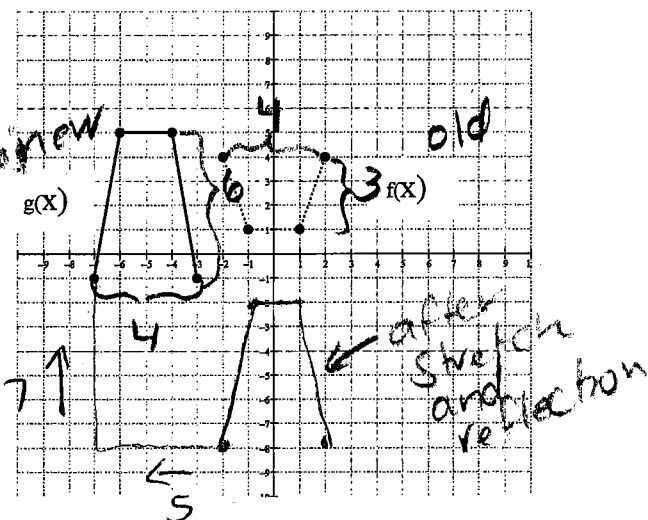
old zeros
 $(-6, 0)$ $(1, 0)$
 (c) $-f(x)$

no change
 $(-6, 0)$
 $(1, 0)$

3. Determine an equation for $g(x)$ of the form $y - k = af(b(x - h))$ given the graphs of $y = f(x)$ and the transformed function $y = g(x)$. $f(x)$ is old and $g(x)$ is new.

(a)

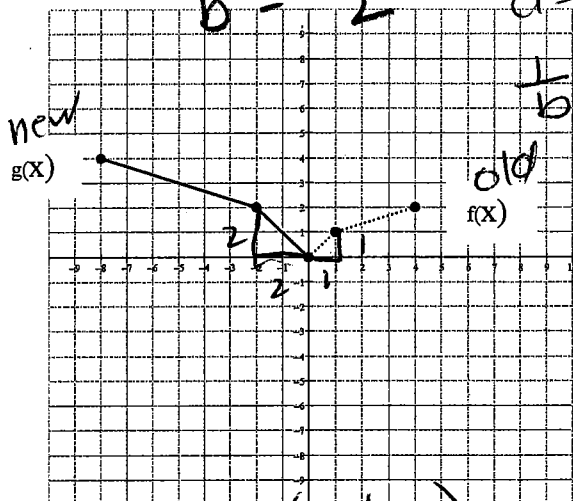
$3a = 6$
 $a = 2$
 reflection over x-axis
 so $a = -2$
 $b = 1$



$$y = -2f(x+5) + 7$$

(b)

$a = 2$
 $b = -\frac{1}{2}$
 $1(a) = 2$
 $a = 2$
 $\frac{1}{b} = 2$
 $b = \frac{1}{2}$



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

4. If $(4, -3)$ is a point on the graph of $y = f(x)$, what must be the coordinates of the point after the graph undergoes the transformation

(a) $y = f(2x + 10)$

$$y = f(2(x+5))$$

$$\frac{4}{2} = 2$$

$$\frac{-3}{2} = -1.5$$

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

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

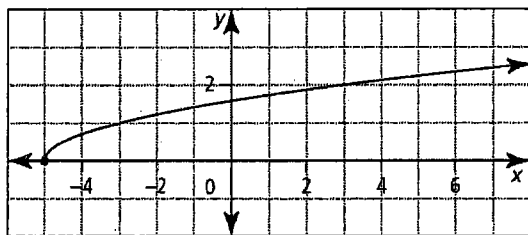
$$\frac{4}{2} = 2$$

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

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

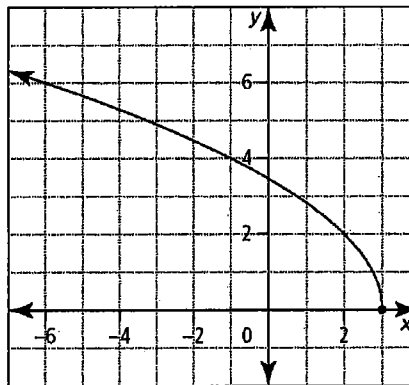
5. For each function, write an equation of a radical function of the form $y = a\sqrt{b(x-h)} + k$.

a)



$$y = \sqrt{\frac{1}{2}(x+5)}$$

b)



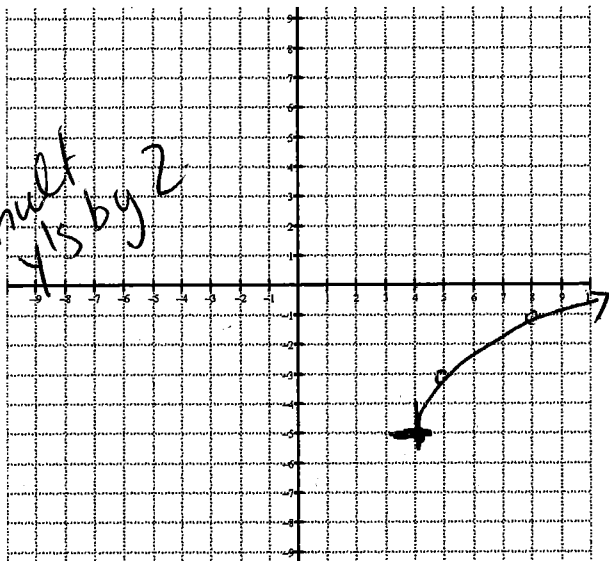
$$y = 2\sqrt{-(x-3)}$$

6. Sketch the graph of each function using transformations.

a) $y = 2\sqrt{x-4} - 5$

0	0
1	1
4	2
0	0
1	2
4	4

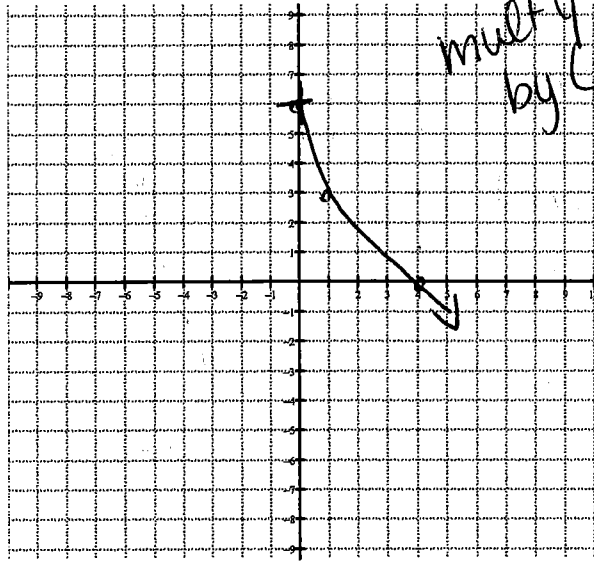
mult
y's by 2



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

0	0
1	1
4	2
0	0
1	-3
4	-6

mult y's
by (-3)

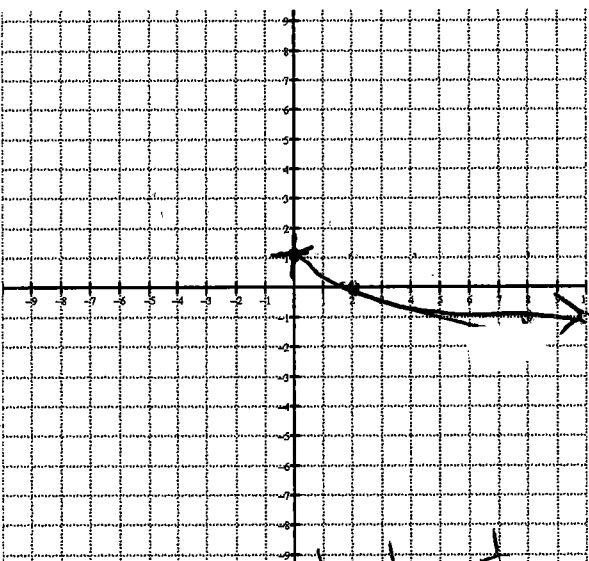


c) $y = -\sqrt{0.5x} + 1$

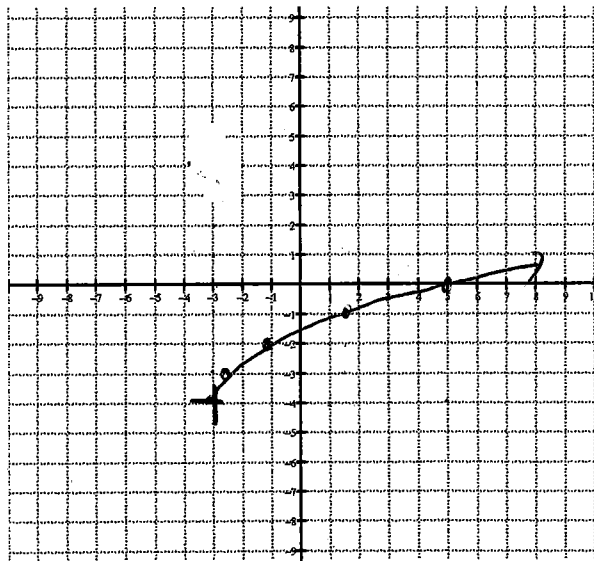
0	0
1	1
4	2

0	0
2	-1
8	-2

divide x's by 1/2.
mult y's by (-1)



d) $y + 4 = \sqrt{2(x+3)}$



divide
x's by 2

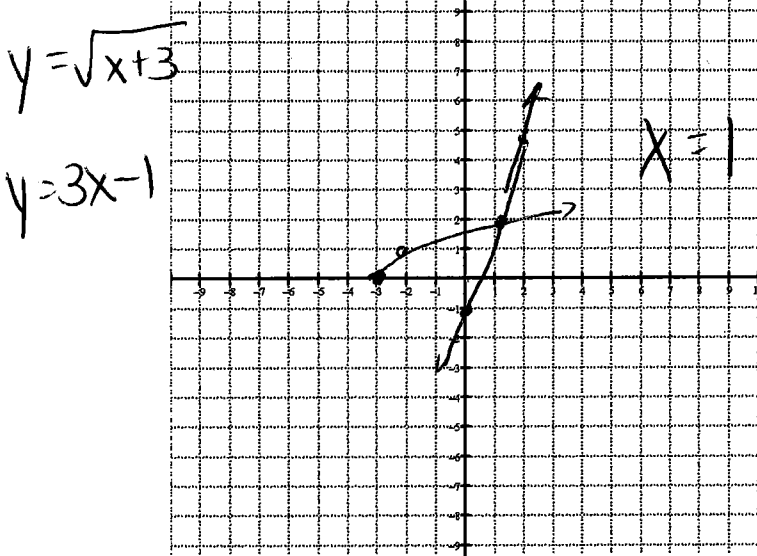
0	0
1	1
4	2
9	3
16	4

0	0
1/2	1
2	2
4.5	3
8	4

$y = \sqrt{2(x+3)} - 4$

7. Solve each equation graphically.

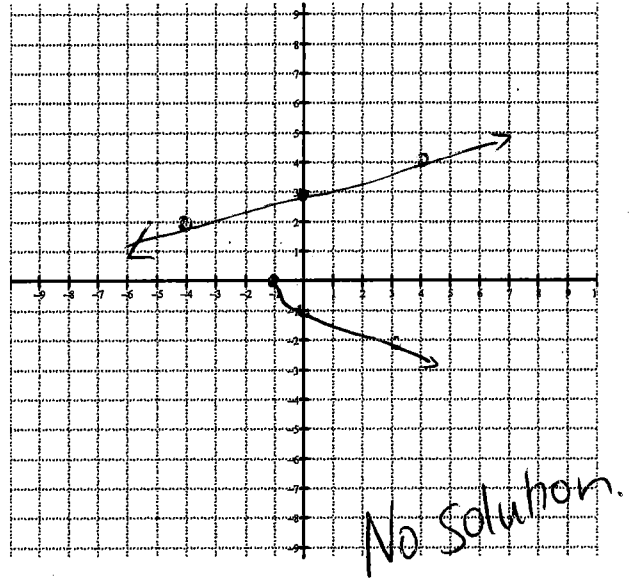
a) $\sqrt{x+3} = 3x - 1$



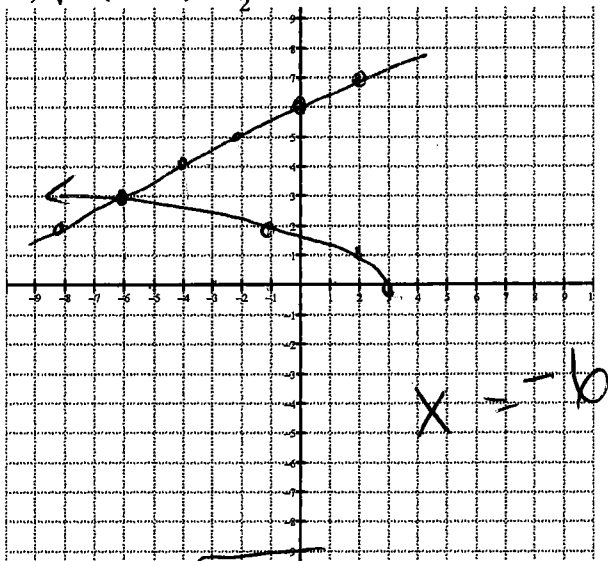
$y = -\sqrt{x+1}$
 $y = \frac{1}{4}x + 3$

0 0
1 | x-1
4 | x-2

b) $-\sqrt{x+1} = \frac{1}{4}x + 3$



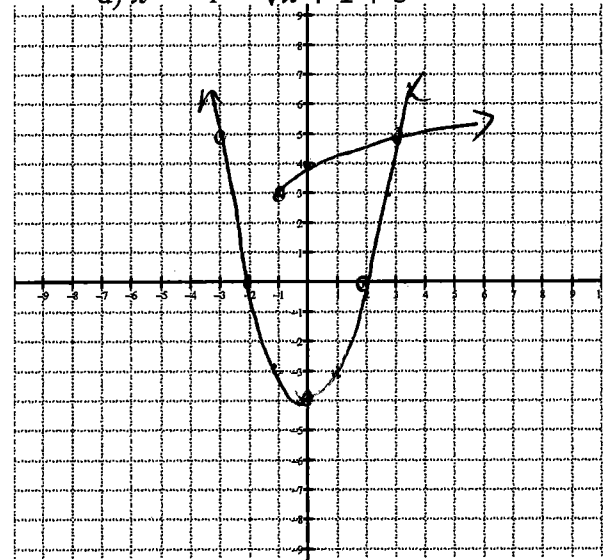
c) $\sqrt{-(x-3)} = \frac{1}{2}x + 6$



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

0	0	0
-1	x	1
-4	x	2
-9	x	3

d) $x^2 - 4 = \sqrt{x+1} + 3$



$y = x^2 - 4$ parabola
 $y = \sqrt{x+1} + 3$

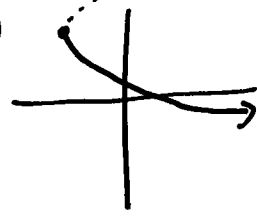
$x = 3$

8. Write a **single equation** for a radical function for each of the following with the given domain and range. (1 mark each)

- (a) D: $\{x/x \geq -3, x \in \mathbb{R}\}$
 R: $\{y/y \leq 5, y \in \mathbb{R}\}$

endpoint $(-3, 5)$

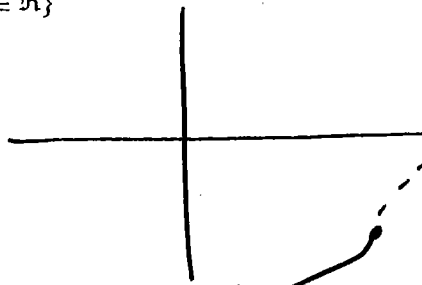
$$y = -\sqrt{x+3} + 5$$



- (b) D: $\{x/x \leq 9, x \in \mathbb{R}\}$
 R: $\{y/y \leq -7, y \in \mathbb{R}\}$

endpoint $(9, -7)$

$$y = -\sqrt{-(x-9)} - 7$$



9. The point $(4, 10)$ is on the graph of the function $f(x) = k\sqrt{3(x-1)} + 4$. What is the value of k ?

$(4, 10)$
 x, y

$$y = k\sqrt{3(x-1)} + 4$$

$$10 = k\sqrt{3(4-1)} + 4$$

$$10 = k\sqrt{9} + 4$$

$$6 = 3k$$

$$2 = k$$

10. Find the inverse of the functions

a) $f(x) = \frac{2}{3}x + 5$

$$y = \frac{2}{3}x + 5$$

$$x = \frac{2}{3}y + 5$$

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

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

$$\frac{3x-15}{2} = y$$

$$f^{-1}(x) = \frac{3x-15}{2}$$

b) $f(x) = \frac{3}{x+5}$

$$x = \frac{3}{y+5}$$

$$x(y+5) = \left(\frac{3}{y+5}\right)(y+5)$$

$$x(y+5) = 3$$

$$y+5 = \frac{3}{x}$$

$$y = \frac{3}{x} - 5$$

c) $f(x) = \frac{x}{x-2}$

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

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

$$xy - 2x = y$$

$$xy - y = 2x$$

$$y(x-1) = 2x$$

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