

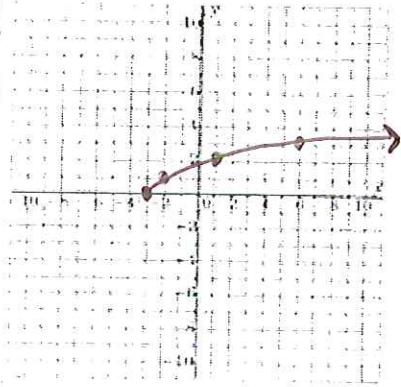
6.8, Hmwk Wkst for Graphing Radical Functions

Graph each function.

1. $y = \sqrt{x+3}$

left 3

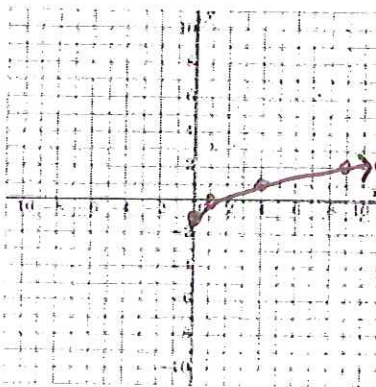
x	y
-3	0
-2	1
1	2
6	3
13	4



2. $y = \sqrt{x-1}$

down 1

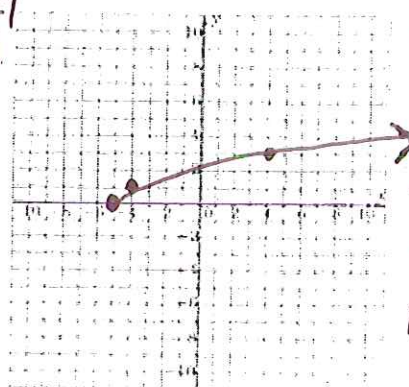
x	y
0	-1
1	0
4	1
9	2



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

left 5

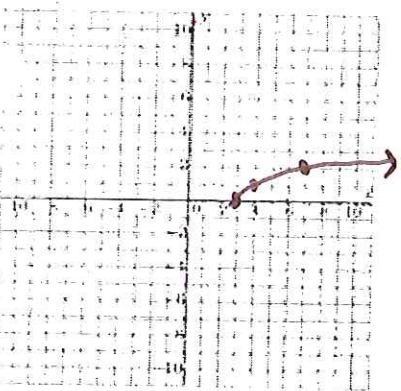
x	y
-5	0
-4	1
-1	2
4	3
11	4



4. $y = \sqrt{x-3}$

right 3

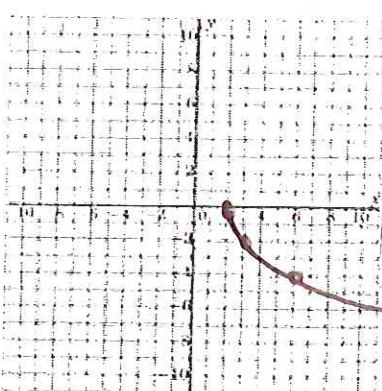
y	x
0	3
1	4
2	7



5. $y = -2\sqrt{x-2}$

stretch -2
right 2

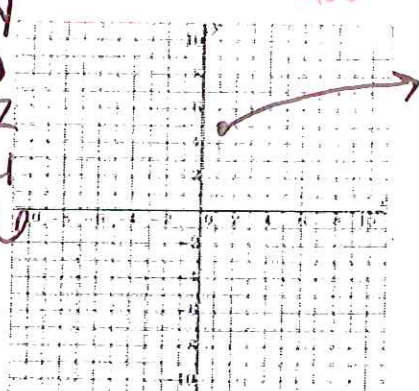
x	y
2	0
3	-2
6	-4
11	-6



6. $y = \frac{1}{4}\sqrt{x-1} + 5$

compress 1/4
right 1
up 5

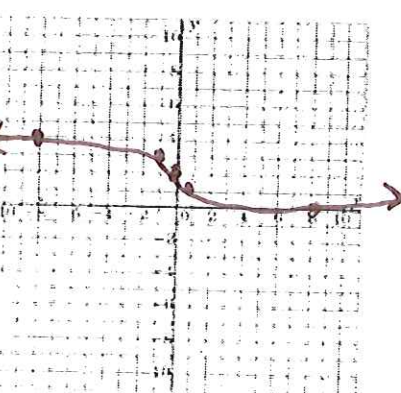
x	y
1	5
5	5.25
9	5.5
17	6



7. $y = -\sqrt[3]{x+2}$

flip
down 2

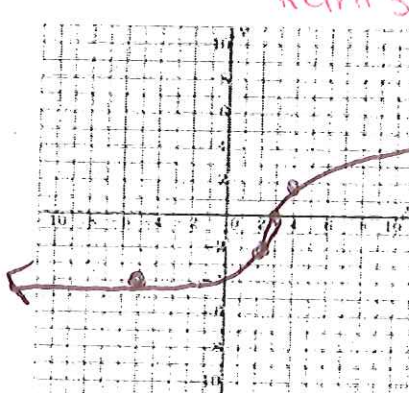
x	y
-8	4
-1	3
0	2
1	1
8	0



8. $y = 2\sqrt[3]{x-3}$

stretch 2
right 3

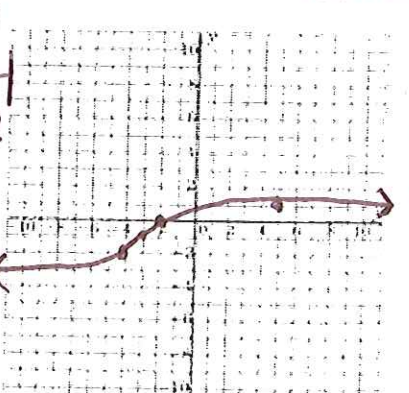
x	y
-5	4
2	2
3	0
4	2
11	4



9. $y = \sqrt[3]{x+3} - 1$

left 3
down 1

x	y
-11	-3
-4	-2
-3	-1
-2	0
5	1



6.1-6.5 Review

Simplify.

$$1) \frac{24x^2y^3}{(2xy^2)^3} = \frac{24x^2y^3}{8x^3y^6} = \frac{3}{xy^3}$$

$$2) \left(\frac{3x}{4x^3}\right)^{-2} = \frac{x^{-2}x^{-2}}{4^{-2}x^{-6}} = \frac{10x^0}{9x^2} = \frac{10x^4}{9}$$

$$3) \sqrt[4]{32x^7y^{12}z^9} = \pm 2x^1y^3z^2 \sqrt[4]{x^3z^1}$$

$$4) \sqrt{\frac{16x^4}{4x^2}} = \frac{\pm 4x^2}{2x} = \pm 2x$$

$$5) \sqrt[3]{\frac{3}{2x}} \cdot \sqrt[3]{\frac{24x^2}{4x^2}} = \frac{\sqrt[3]{12x^2}}{\sqrt[3]{8x^3}} = \frac{\sqrt[3]{12x^2}}{2x}$$

$$6) \frac{2\sqrt{2}}{5-\sqrt{3}} \cdot \frac{\sqrt{2}+\sqrt{3}}{\sqrt{2}+\sqrt{3}} = \frac{10\sqrt{2} + 2\sqrt{6}}{2\sqrt{2}-\sqrt{9}} = \frac{10\sqrt{2}+2\sqrt{6}}{2\sqrt{2}-3}$$

$$7) 4\sqrt{2x^2y^3} \cdot 5\sqrt{6x^3y^4} = 20\sqrt[4]{12x^5y^7} = 40x^2y^3\sqrt[4]{3x^1y^1}$$

$$8) 4^{\frac{1}{3}} \cdot 4^{\frac{2}{5}} = 4^{\frac{5}{15} + \frac{6}{15}} = 4^{\frac{11}{15}} = 16^{\frac{11}{15}}$$

or $\sqrt[15]{16^{11}}$

x²i

$$9) (-8)^{\frac{3}{2}} = \sqrt{-8^3} = \sqrt{-512}$$

$$10) \left(2x^{\frac{2}{3}}\right)^{-1} = 2^{-1}x^{-2/3} = \frac{1}{2x^{2/3}}$$

$$\pm i\sqrt{512}$$

$\pm 16i\sqrt{2}$

Solve.

$$11) \sqrt{3x-3} + 5 = 20$$

$$\sqrt{3x-3} = 15$$

$$3x-3 = 225$$

$$3x = 228$$

$$x = 76$$

$$12) \sqrt{5x+4} - \sqrt{x} = 0$$

$$\sqrt{5x+4} = \sqrt{x}$$

$$5x+4 = x$$

$$x = -1$$

$$4x = -4$$

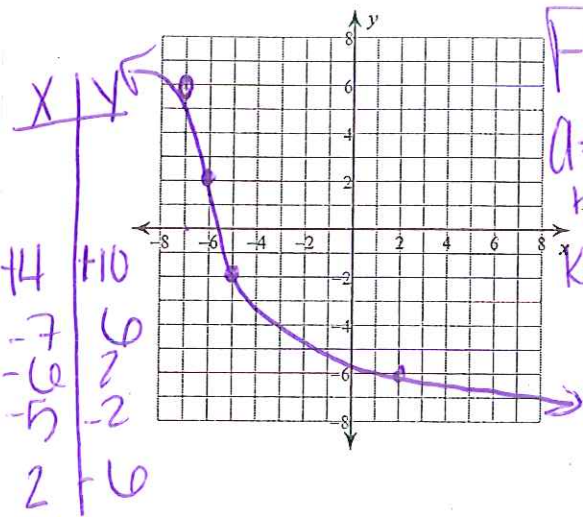
Sketch the graph of each function. Then state the domain and the range.

GCF

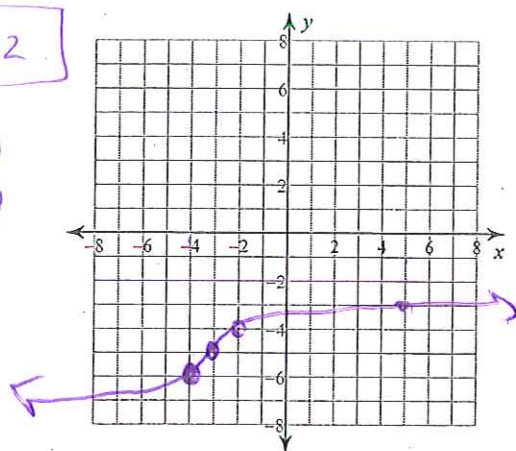
7) $y = \sqrt[3]{-64x - 384} + 2$

8) $y = \sqrt[3]{x+3} - 5$

$n=3$: left 3
 $k=-n$: down 5



$-4 \sqrt[3]{x+6} + 2$
 $a = -4$ stretch
 $h = 6$ left 6
 $k = 2$ up 2



x	y
-11	-7
-4	-6
-3	-5
-2	-4
n	-3

Solve each equation.

9) $(3a + 61)^2 = 8$

$3a + 61 = \sqrt[3]{8}$
 $3a + 61 = 4$

$3a = -57$
 $a = -19$

Solve each equation. Remember to check for extraneous solutions.

10) $\sqrt{\frac{b}{4}} = 4$

$\frac{b}{4} = 16$

$b = 64$

$\sqrt{\frac{64}{4}} = 4$

$\sqrt{16} = 4$

$\pm 4 = 4 \checkmark$

11) $\sqrt{3n+14} = \sqrt{2n+12}$

$3n+14 = 2n+12$

$n = -2$

$\sqrt{(3)(-2)+14} = \sqrt{2(-2)+12}$

$\sqrt{-6+14} = \sqrt{-4+12}$

$\sqrt{8} = \sqrt{8} \checkmark$

$$12) \sqrt{30-a} = a^2$$

$$30-a = a^2$$

$$a^2 + a - 30 = 0$$

$$(a+6)(a-5) = 0$$

$$a = -6 \quad a = 5$$

$$\sqrt{20-5} = 5$$

$$\sqrt{25} = 5$$

$$5 = 5 \checkmark$$

$$\sqrt{30-6} = 6$$

$$\sqrt{30-6} = 6$$

$$6 = 6 \checkmark$$

Perform the indicated operation.

$$14) f(a) = -2a - 2$$

$$g(a) = a + 2$$

Find $(f-g)(a)$

$$(-2a-2) - (a+2)$$

$$-3a-4$$

$$16) f(a) = a - 3$$

$$g(a) = 3a + 2$$

Find $(f \circ g)(-8)$

$$f(g(-8))$$

$$3(-8) + 2$$

$$-24 + 2$$

$$= -22$$

$$-22 - 3$$

$$\boxed{-25}$$

$$13) x-9 = \sqrt{21-2x}$$

$$(x-9)^2$$

$$x^2 - 18x + 81 = 21 - 2x$$

$$x^2 - 16x + 60 = 0$$

$$(x-6)(x-10) = 0$$

$$x = 6 \quad \text{or} \quad x = 10$$

$$10-9 = \sqrt{21-20}$$

$$1 = \sqrt{1}$$

$$1 = 1 \checkmark$$

$$6-9 = \sqrt{21-12}$$

$$-3 = \sqrt{9}$$

$$-3 = \pm 3 \checkmark$$

$$15) h(n) = 4n + 5$$

$$g(n) = n^2 - 2$$

Find $(5h+2g)(n)$

$$5(4n+5) + 2(n^2-2)$$

$$20n + 25 + 2n^2 - 4$$

$$\boxed{2n^2 + 20n + 21}$$

$$17) h(a) = -2a$$

$$g(a) = a^2 - 4a$$

Find $\left(\frac{h}{g}\right)(a)$

$$\frac{-2a}{a^2-4a} = \frac{-2a}{a(a-4)}$$

$$\boxed{\frac{-2}{a-4}}$$

6.7-6.8 Review

Find the inverse of each function.

1) $h(n) = 2n + 5$
 $y = 2n + 5$
 $n = 2y + 5$
 $n - 5 = 2y$

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

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

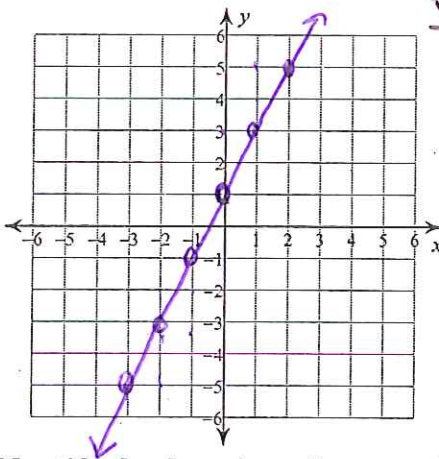
$\sqrt[3]{x + 1} = y - 2$
 $\sqrt[3]{x + 1} + 2 = y$

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

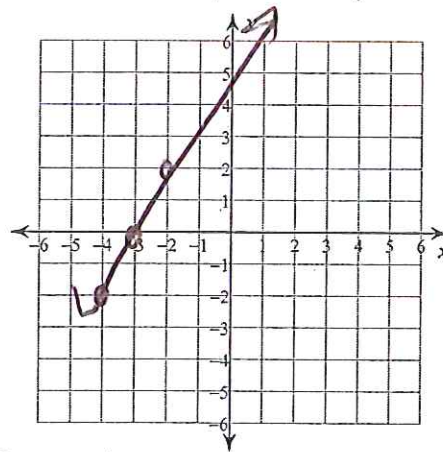
4) $f(x) = \frac{8 + x}{4}$

Graph the function and its inverse. Is the inverse a function?

5) $f(x) = 2x + 1$
 $x = 2y + 1$
 $x - 1 = 2y$
 $\frac{x - 1}{2} = y$
 yes.



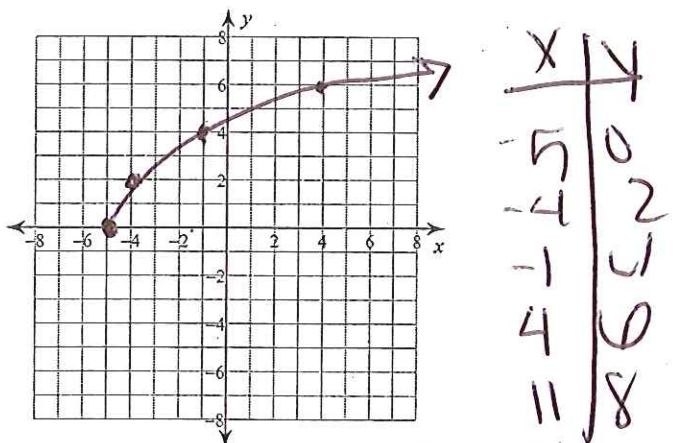
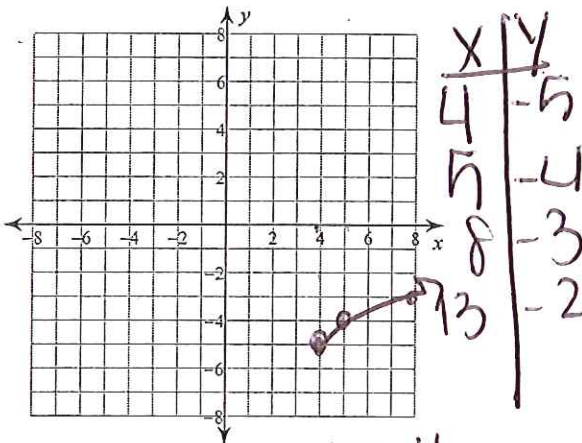
6) $f(x) = 2(x + 3)^3$
 yes



Identify the domain and range of each. Then sketch the graph.

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

8) $y = \sqrt{4x + 20}$
 $\sqrt{4(x + 5)}$
 $2\sqrt{x + 5}$



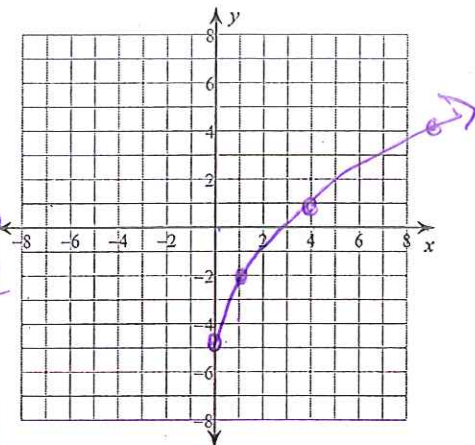
Domain: $[4, \infty)$ $x \geq 4$
 Range: $[-5, +\infty)$ or $y \geq -5$

Domain: $x \geq -5$ $[-5, \infty)$
 Range: $y \geq 0$ $[0, \infty)$

$a=3$ stretch $k=5$ down 5

9) $y = 3\sqrt{x} - 5$

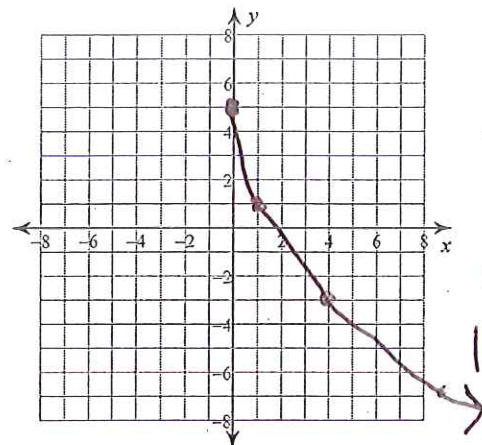
x	y
0	-5
1	-2
4	1
9	4



flip stretch 4 up 5

10) $y = -4\sqrt{x} + 5$

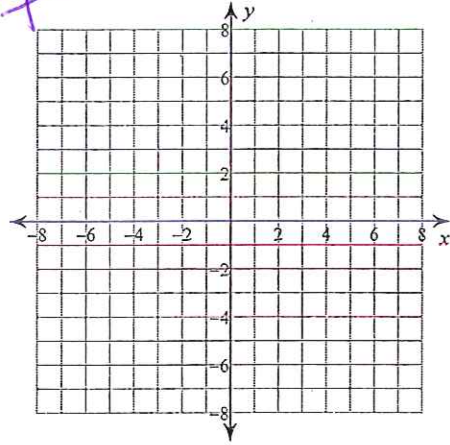
x	y
0	5
1	1
4	-3
9	-7
16	-11



Sketch the graph of each function. Then state the domain and the range.

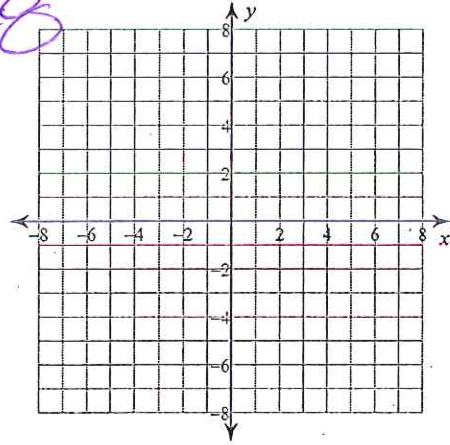
11) $y = \sqrt[3]{-64x - 384} + 2$

#7



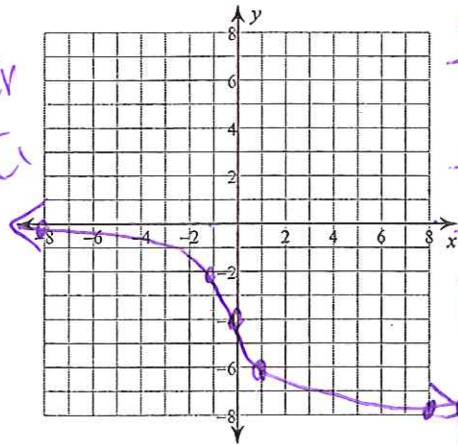
12) $y = \sqrt[3]{x + 3} - 5$

#8



13) $y = -2\sqrt[3]{x} - 4$

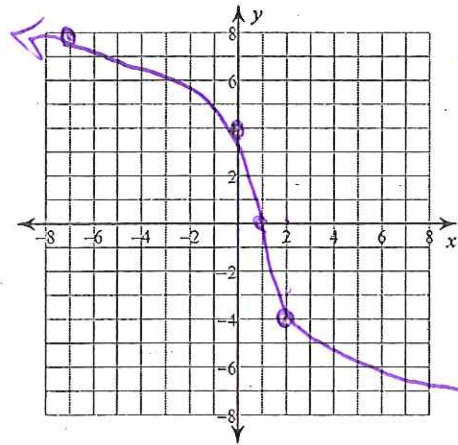
Flip stretch 2 down 4



x	y
-80	
-1	-2
0	-4
1	-6
8	-8

14) $y = \sqrt[3]{-64x + 64}$

$\sqrt[3]{-64(x-1)}$



$-4\sqrt[3]{x-1}$

x	y
-7	8
0	4
1	0
2	-4
9	-8