

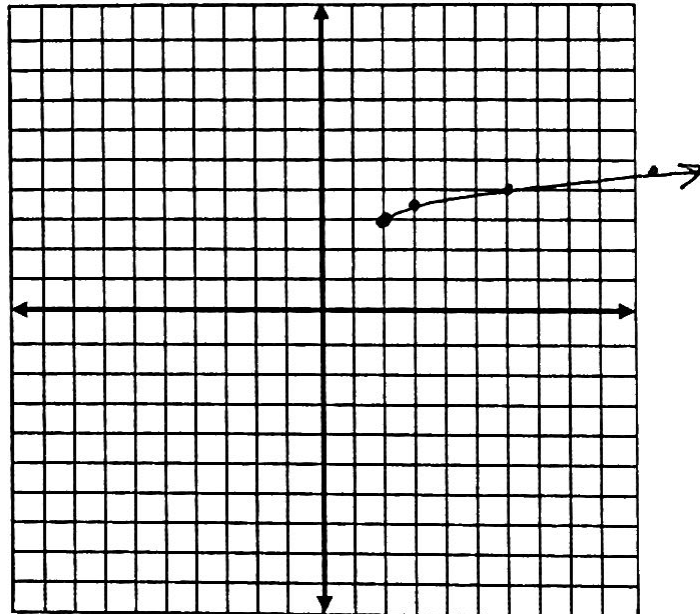
- 1) Graph  $y = \frac{1}{2}\sqrt{x-2} + 3$ . **LABEL THE COORDINATES** for the final graph on or next to your graph. Then state the domain and range in interval notation.

Start  
 $y = \sqrt{x}$   

x	y
0	0
1	1
4	2
9	3

Square root  $f(x)$   
 right 2 units  
 up 3 units  
 compressed fac 1/2

x	y
2	3
3	3.5
6	4
11	4.5



Domain:  $x \geq 2$   $[2, \infty)$   
 Range:  $y \geq 3$   $[3, \infty)$

- 2) Solve each and check. **Box your answer.**

a)  $(\sqrt{3x+13})^2 = (x+5)^2$  ← don't forget to write  $2x$

$$3x+13 = (x+5)(x+5)$$

$$3x+13 = x^2 + 5x + 5x + 25$$

$$3x+13 = x^2 + 10x + 25$$

$$\begin{array}{r} -3x - 13 \\ \hline 0 = x^2 + 7x + 12 \end{array}$$

← don't forget to foil.  
 ← quadratic set = 0.

$$0 = (x+3)(x+4)$$

← factored

$x = -3$     $x = -4$

← don't forget to check.

b)  $((3x-16)^{1/5})^5 = (2)^5$

$$3x-16 = 32$$

$$\begin{array}{r} +16 \\ \hline 3x = 48 \end{array}$$

$$\frac{3x}{3} = \frac{48}{3}$$

$x = 16$

- get rid of exponent raise both sides to the reciprocal.  
 \* if numerator is even don't forget  $\pm$

Check.      Check.

$$(3(16)-16)^{1/5} = 2$$

$$(48-16)^{1/5} = 2$$

$$32^{1/5} = 2$$

$$2 = 2 \checkmark$$

check:

$x = -3$	} $x = -4$
$\sqrt{3(-3)+13} = -3+5$	
$\sqrt{4} = -3+5$	
$2 = 2 \checkmark$	$\sqrt{3(-4)+13} = -4+5$
	$\sqrt{1} = 1$
	$1 = 1 \checkmark$

3) Simplify each completely. **Box your answer.**

a)  $\left(\frac{8x^7y^{11}}{27xy^2}\right)^{\frac{2}{3}}$  - use prop of exponents to simplify

$$\left(\frac{8x^6y^9}{27}\right)^{\frac{2}{3}}$$

← distributed exponent to everything.

$$\frac{8^{\frac{2}{3}} x^4 y^6}{27^{\frac{2}{3}}}$$

$$\boxed{\frac{4x^4y^6}{9}}$$

b)  $\sqrt{12} - 4\sqrt{75} + 7\sqrt{3}$  - breakdown the square root factors.

$$\sqrt{4}\sqrt{3} - 4\sqrt{25}\sqrt{3} + 7\sqrt{3}$$

$$2\sqrt{3} - 4 \cdot 5\sqrt{3} + 7\sqrt{3}$$

$$2\sqrt{3} - 20\sqrt{3} + 7\sqrt{3}$$

$$\boxed{-11\sqrt{3}}$$

4) Find  $f(g(-9))$  given the functions below. **Box your answer.**

Start on the inside

$$f(x) = 4x + 7$$

$$g(x) = 2x^2 + 4x - 1$$

$$g(-9) = 2(-9)^2 + 4(-9) - 1$$

← plug in -9 for x into the g equation.

$$= 2(81) - 36 - 1$$

$$= 162 - 36 - 1$$

Simplify right side

$$g(-9) = 125$$

← substitute 125 in for g(-9)

$$f(125) = 4(125) + 7$$

← plug in 125 for x into the f equation

$$500 + 7$$

Simplify right side

$$\boxed{f(g(-9)) = 507}$$