

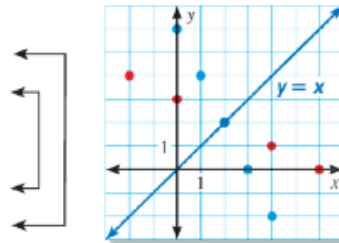
8.4 Using Inverse Operations

Inverse Relations:**Original relation**

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

Inverse relation

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



The graph of an inverse relation is

To find an inverse relation,

Ex 1:

Ex 2:

Ex 3:

Ex 4:

Inverse Functions:

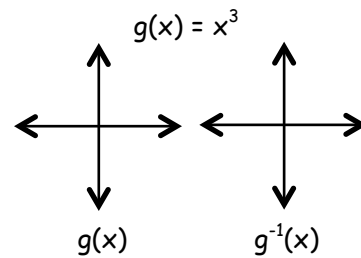
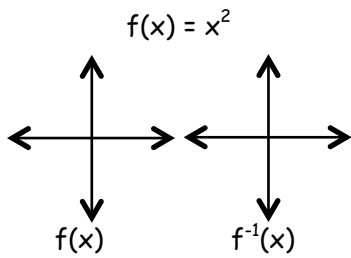
Functions f and g are inverses of each other provided:

Inverse function of $f(x)$ is written as $f^{-1}(x)$ and is read as "f inverse"

IT IS NOT A NEGATIVE EXPONENT!

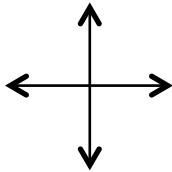
Ex 5: Determine if $f(x)$ and $g(x)$ are inverses.

Ex 6: Determine if $f(x)$ and $g(x)$ are inverses.

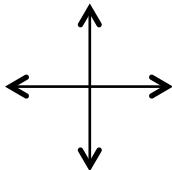


Horizontal Line Test:

Ex 8: Sketch the graph of the function $f(x)$ to determine if $f^{-1}(x)$ is also a function.



Ex 9: Sketch the graph of the function $f(x)$ to determine if $f^{-1}(x)$ is also a function.



You try!

1)

2)

3)

Summarize your notes:

8.4 Practice Problems

Directions: Find the inverse of each function.

1) $h(x) = \frac{20-x}{4}$

2) $g(x) = -x^5 + 1$

3) $f(x) = -2x^3 + 3$

4) $f(x) = (x-2)^2$

5) $g(x) = 2x + 8$

6) $h(x) = 3x^5 - 10$

7) $g(x) = \frac{2}{5}x^6 + 8$

8) $h(x) = -\frac{3}{4}x^5 + 3$

9) $f(x) = \frac{4x^2-1}{2}$

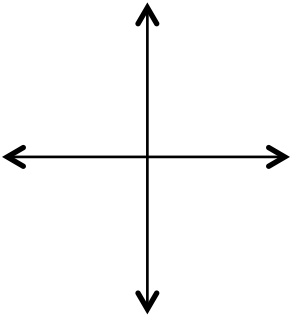
Directions: Determine if the two functions are inverses.

10) $f(x) = 3x - 8$ and $g(x) = \frac{1}{3}x + \frac{8}{3}$

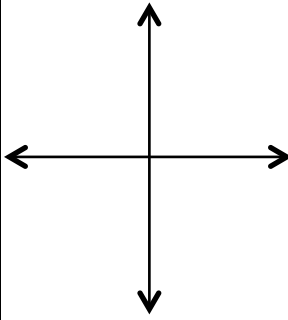
11) $f(x) = 2x^2 - 3$ and $g(x) = \sqrt{\frac{x+3}{2}}$ for $x \geq 0$.

Directions: Sketch the graph and then determine whether or not the function's inverse is also a function.

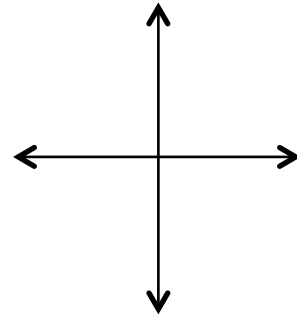
12) $h(x) = 2x^2 - x + 2$



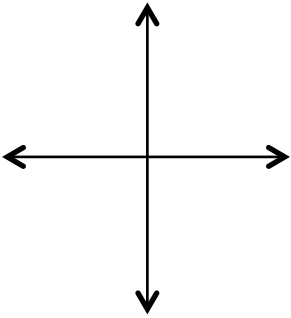
13) $g(x) = |x - 4| + 2$



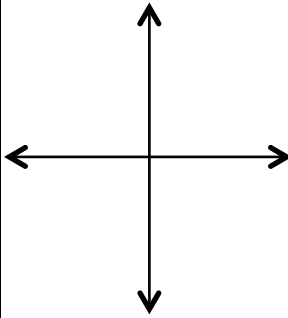
14) $f(x) = \frac{4}{3}x - 3$



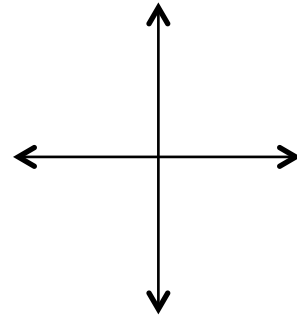
15) $n(x) = \sqrt[3]{2x - 3} + 1$



16) $l(x) = \frac{1}{2}x^4 - 3$

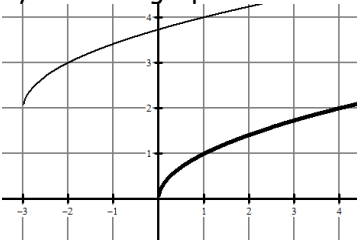


17) $h(x) = \frac{3}{4}\sqrt{x - 2} - 3$



Algebra Skillz

Below, the parent function $f(x) = \sqrt{x}$ is represented by the bold graph.



1) Write the equation of the function not in bold.

2) $\frac{6}{\sqrt{12}}$

3) $\frac{\sqrt{5}}{2\sqrt{10}}$

4) Factor:

$$8b^5 - 2b^4 - 10b^3$$

5) Factor and solve.

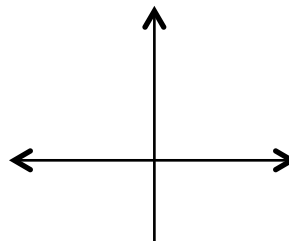
$$6x^2 - 9 = -15x$$

8.4 Application and Extension

1) Find the inverse of $f(x) = 3x^3 - 7$

2) Sketch the graph and then determine whether or not the function's inverse is also a function.

$$g(x) = 2\sqrt[3]{x} - 3$$



3) KaBOOM! is a national organization that envisions a great place to play within walking distance of every child. They passionately believe that play has purpose, and that unstructured play in particular helps make children happier, fitter, smarter, more socially adept and creative. They strive to build playgrounds within walking distance of every child in America. The amount of money spent directly on building playground, s , is modeled by the function: $s = .848r$, where r represents the number of dollars raised.

a) Find the inverse function for the model. (Be careful...one MAJOR change when dealing with actual units. Watch Application Walkthrough video to find out what that is).

b) How much money was raised this past year if they spent \$40 million on building playgrounds?

The number of playgrounds built, n , can be modeled by the function $n = \frac{.848r}{1000} - 1525$, where r represents the number of dollars raised by KaBOOM! in a given year.

c) Find the inverse for the above model.

d) If KaBOOM! built 39,179 playgrounds last year, how many dollars did they raise?

4) Brust has three kids and is extremely tired from chasing them around all the time. Because of this he makes a TON of mistakes in his packets. In fact he came up with a model for it. The number of mistakes he makes in a chapter, m , is a function of the number of kids, k , that someone has. That model is $m(k) = \sqrt{\frac{3k+2.8}{0.9}} + 4.4$.

a) Order the Algebros by who makes the most mistakes per unit. (Sully has no kids, Brust 3, Kelly 4, and Bean 9)

b) Find the inverse function.

SAT PREP Below are sample SAT questions. The SAT is the main standardized test that colleges look at for admission. One is multiple choices; the other is free response where you must grid in your answer. Blow it up.

MULTIPLE CHOICE

If n and p are positive integers and $5^{n/p} = \sqrt[4]{125}$, then the product of n and p is:

- (A) -1
- (B) 0
- (C) 4
- (D) 8
- (E) 12

GRID IN

If $p^m \cdot p^5 = p^{12}$, and $(p^{-4})^n = p^{-24}$, what is the value of $m-n$?

•	•	•	•
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9