

## 5B.1 - Notes on INVERSES

Name: \_\_\_\_\_

### GSE Algebra II

Date: \_\_\_\_\_

---

#### What is the INVERSE of a Function?

- It is essentially changing the ordered pair.
- Switching of the x value and y value of a point

#### Inverses Algebraically – How do we find the Inverse of a function algebraically?

1. Step 1 – change  $f(x)$  to a y value
2. Step 2 – switch the x value and the y value in the equation
3. Step 3 – solve for y
4. Step 4 – replace y with  $f^{-1}(x)$

#### Examples

1.)  $f(x) = 3x - 7$

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

3.)  $f(x) = x^3 + 4$

4.)  $f(x) = \sqrt{x-2} + 5$

5.)  $y = 3^x$

6.)  $y = 2^{x-1}$

7.)  $y = \log_3 x$

8.)  $y = \log_4(x+2)$

### How to Determine if 2 functions are Inverses of Each other

1. Step 1 – do the composition of each function
  - a.  $f(g(x)) = x$
  - b.  $g(f(x)) = x$
2. Step 2 – if both compositions equal  $x$ , the 2 functions are Inverses
3. Step 3 – if both compositions do not equal  $x$ , the 2 functions are not Inverses

### Determine whether each pair of functions are inverse functions using composite functions.

9)  $f(x) = 3x - 6$   
 $g(x) = \frac{x+6}{3}$

10)  $f(x) = 4x^2 - 3$   
 $g(x) = \frac{\sqrt{x+3}}{2}$

11)  $f(x) = \log_2 x$   
 $g(x) = 2^x$

12)  $f(x) = \log_3(x) + 1$   
 $g(x) = 3^{x-1}$

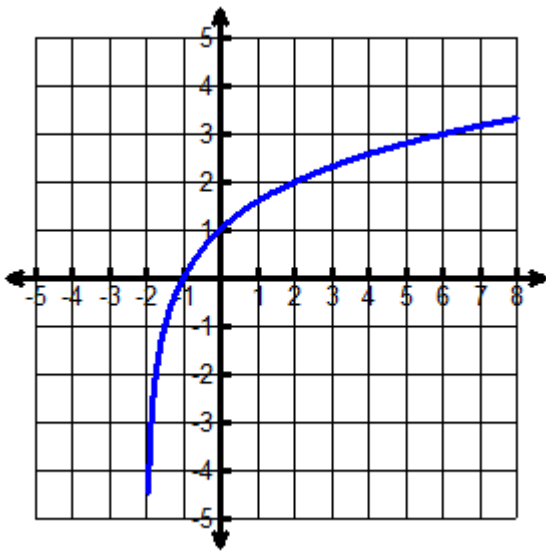
13)  $f(x) = \log_4(x) - 2$   
 $g(x) = 4^x$

### Inverses graphically – How do we find the Inverse of a function graphically?

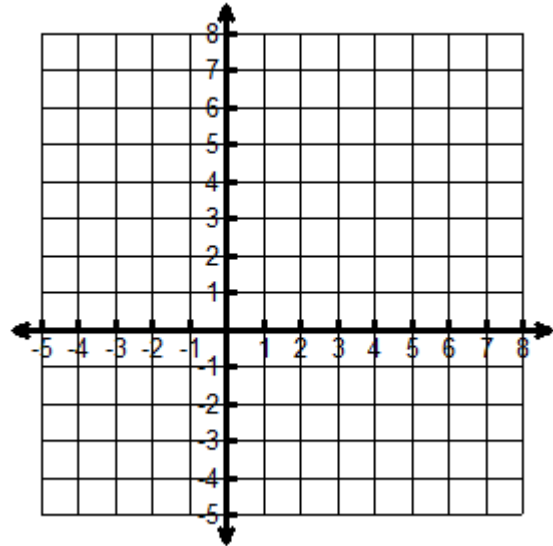
1. Step 1 – plot 4 to 5 points on the given graph
2. Step 2 – write down each ordered pair that corresponds with each plotted point
3. Step 3 – Switch the x values and y values in the ordered pairs
4. Step 4 – plot the NEW points on the same graph
5. Step 5 – play connect the dots to see the graph of the inverse

Find the inverse of each function.

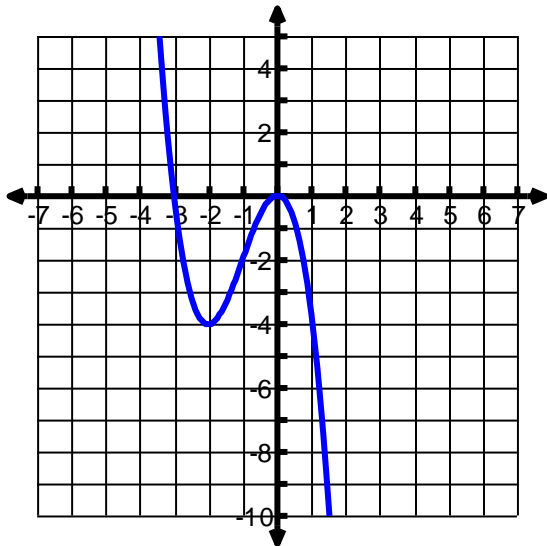
14)



15) INVERSE OF #5



16)



17) INVERSE OF # 6

