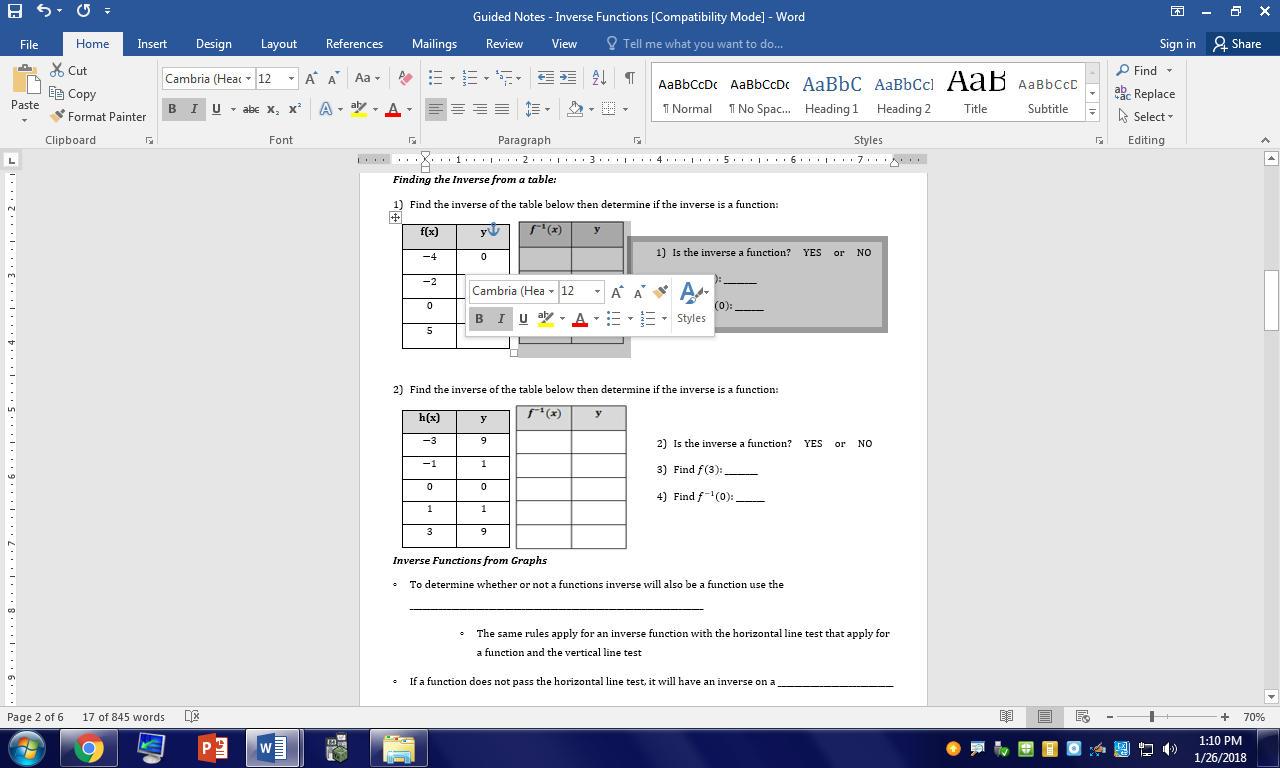
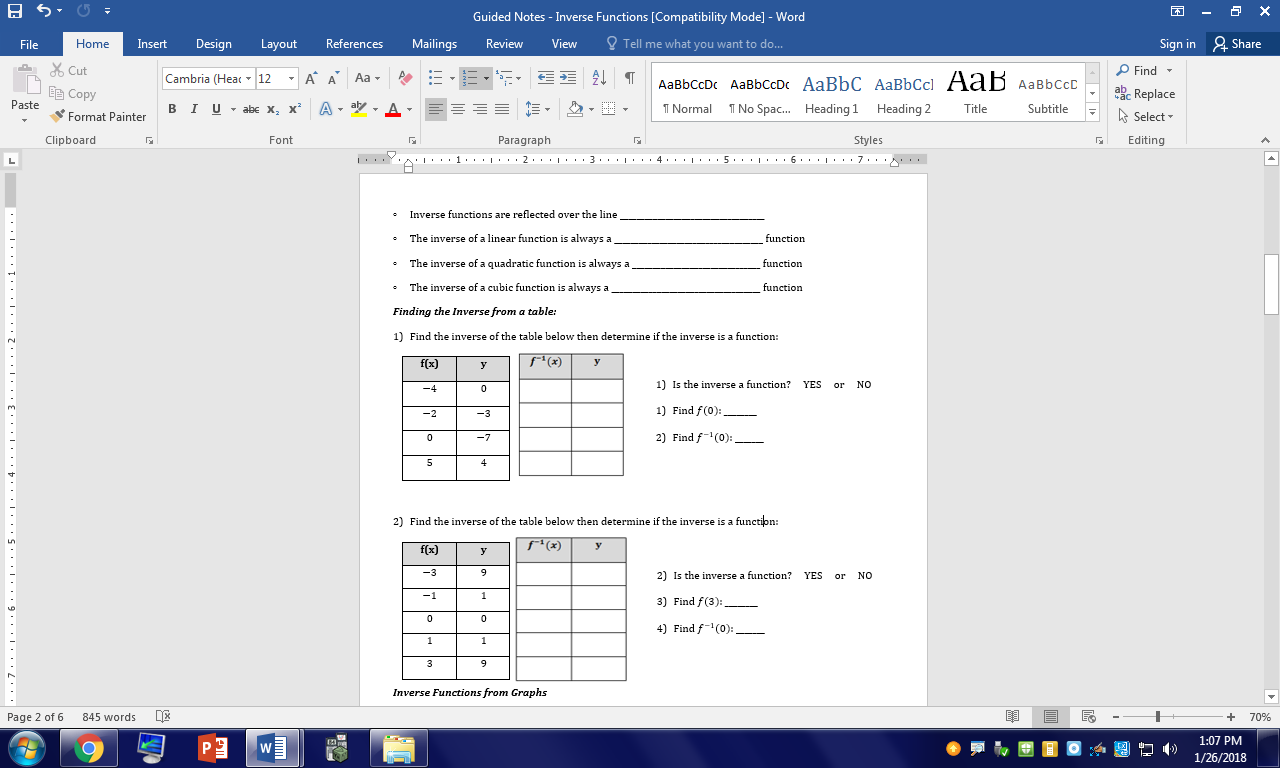
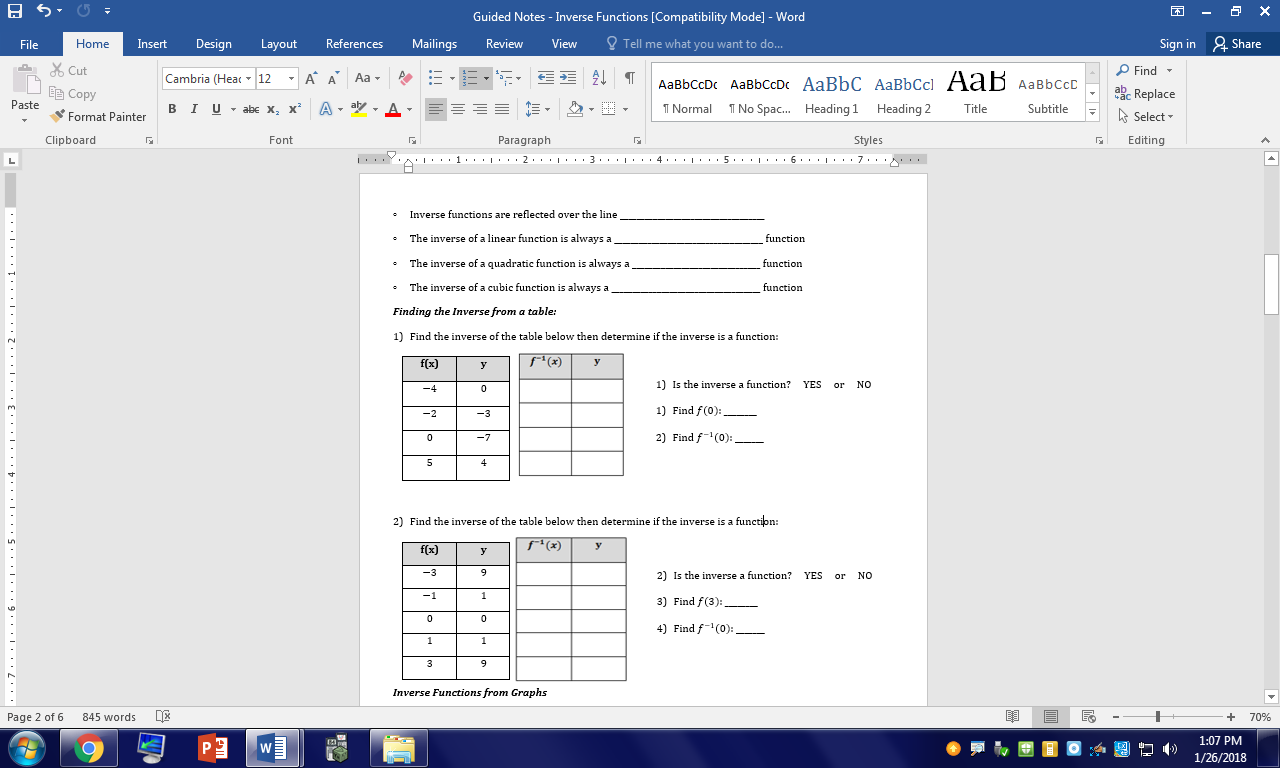
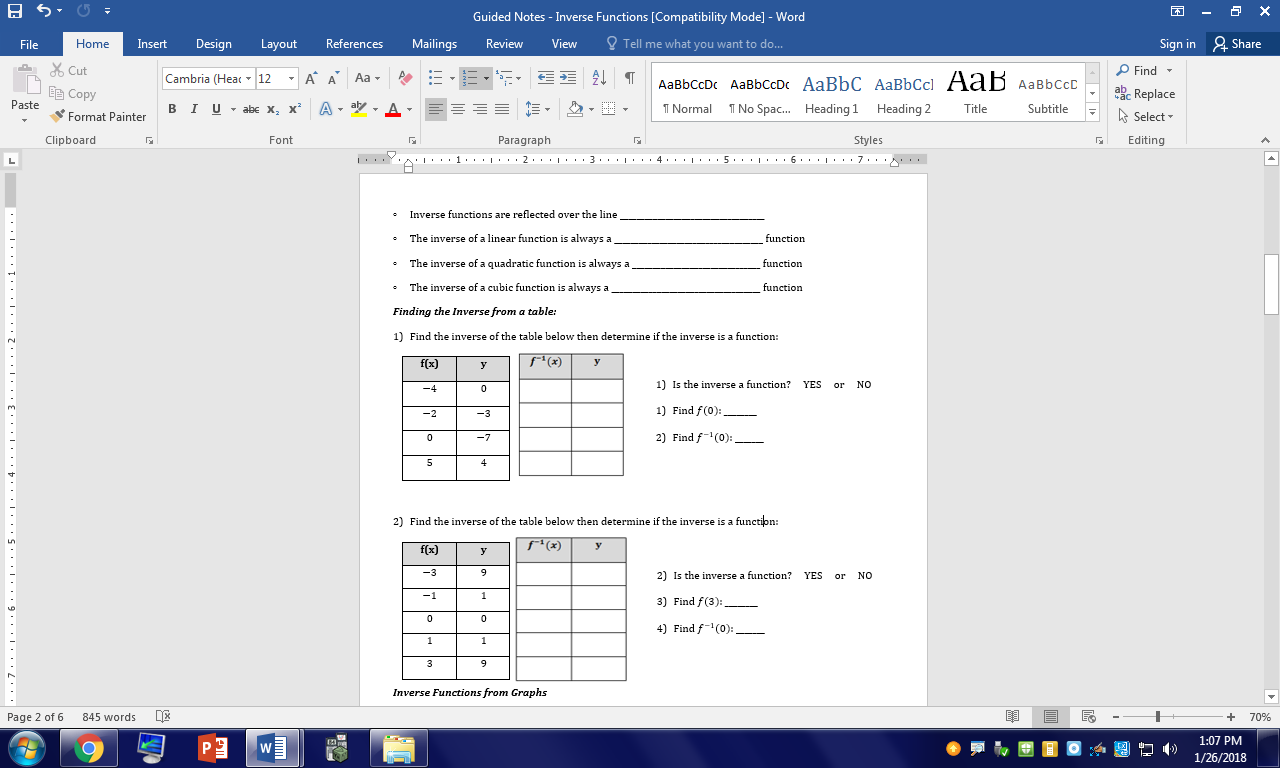
**Inverse Functions**

* Inverse functions are essentially functions that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_each other
  + Think of the function . How do you “undo” squaring x? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are inverse functions
* In an inverse function, the \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_ values switch places
* When the x and y values switch, this results in a reflection over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The inverse of the function f is labeled \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. We read this as “f inverse” or “f prime.”

***For each table below create a table that represents the inverse. Label the inverse correctly using function notation.***



**x**

**x**

**h(x)**

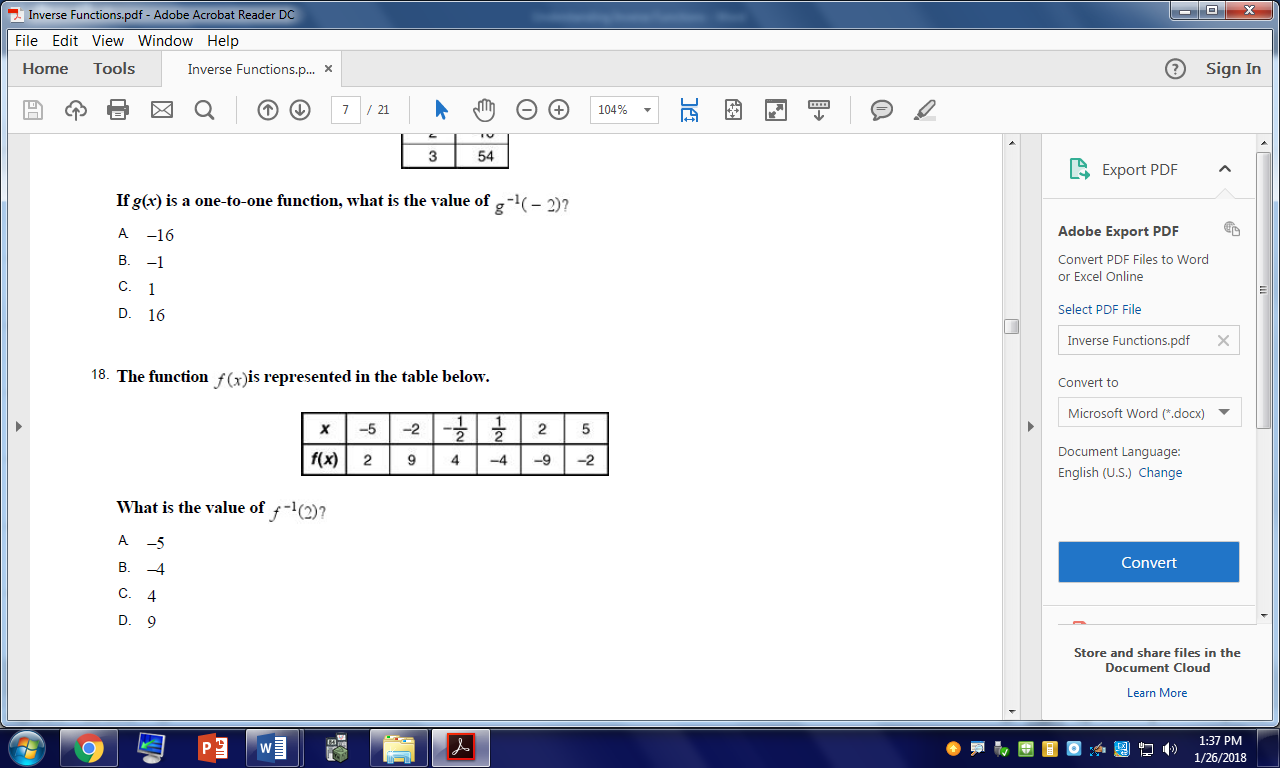
**x**

**f(x)**

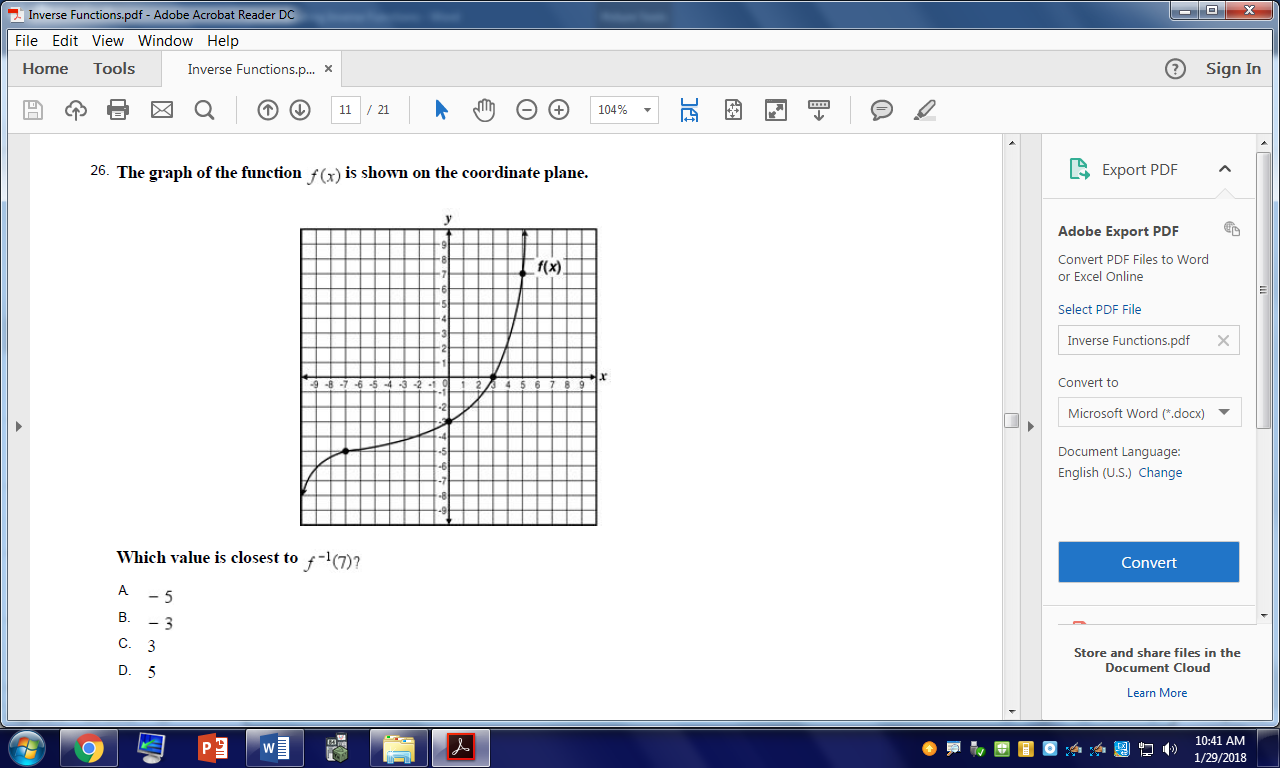
**x**

1. Does represent a function? \_\_\_\_\_\_\_\_\_\_\_\_
2. Does represent a function? \_\_\_\_\_\_\_\_\_\_
3. Find \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Does represent a function? \_\_\_\_\_\_\_\_\_\_\_\_
7. Does represent a function? \_\_\_\_\_\_\_\_\_\_
8. Find \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. What is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. What is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* In the examples above, you were asked to evaluate the inverse function for a given input. Is there a pattern that you could use to evaluate the inverse of a function without creating an inverse table? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + If the point is a point on , what point would be on \_\_\_\_\_\_\_\_\_\_\_\_\_
  + If the point is a point on , what point would be on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Use the table of below to answer the following questions:**

1. \_\_\_\_\_\_\_
2. = \_\_\_\_\_\_\_\_

***The function is shown on the graph below. Using the same approach, you used with the tables, find the inverse values requested below:***

1. \_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_

***Proving that two functions are inverses:***

* If two functions are inverses, they are essentially \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ functions. Because these two functions are opposites of one another, they should cancel each other out.
  + For any set of inverse functions , \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_.
    - Another way of writing is and another way of writing is

**Each pair of functions below represent inverses of one another. Prove in two ways that these equations are inverses.**

* Before proving functions are inverses, if may be helpful to review some inverse operations.
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are inverse operations that cancel each other out.
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are inverse operations that cancel each other out.
  + The same is true for \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ etc.

**Steps to finding the inverse**

|  |  |
| --- | --- |
| **1. Replace f(x) with y**  **2. Switch x and y**  **3. Solve for y**  **4. Replace y with f­­­ -1­(x)** | **Example: f(x) = 3x+1** |

**Practice**

1. 2.

3. 4.