Pre Calculus

Date:

Items Needed: .Book,

Objective: The students will be able determine what an inverse function is and how to find it given any function.

PA Common Core: cc.2.2.hs.c.4

Lesson:

- On the overhead graph: $f(x) = 2x - 3$ and $f^{-1}(x) = \dfrac{1}{2}(x + 3)$

- To be an inverse of each other the graphs should be reflections of each other with respect to the line y=x.
- What does this mean? If the point (a,b) is on the graph of f, the point of (b,a) is on the graph of f^{-1}.
- Do example 3.
- Graph example 3 and look at the functions graphically.
- Do example 5 and verify that they are inverses of each other using the table feature of the calculator. Make sure everyone understands the coordinates with the 3 different columns in the table.
- Look at the numerical solution for example 6.

- What is a function?
- We have to be careful when we try to find and inverse of a function. Just because we start with a function doesn't mean that the inverse is a function.
- Have students refer to the section highlighted on p. 64 in my text. This is an example of what can't happen.
- So how can keep from doing all the work just to see if doesn't work. We can use the horizontal line test which shows that there is a one to one relationship, one x value to one y value.
- Refer to example 7 & 8
- When a function fails the horizontal test it does not have an inverse unless you restrict the domain of the function. ie the x^2 function.

- So how do we find an inverse?
  1. Check the function with the horizontal line test.
  2. In the equation for f(x), replace f(x) by y.
  3. Interchange the x and y variables.
  4. After you solve for y, replace y with f^{-1}.

- Quickly look over example 9, pointing out the domain.
- Do example 10. Point out that the range of the function becomes the domain of the inverse function. Make sure you watch the domain of this one.
- Look over example 11.

Assignment: .Have students do 2, 3, 5, 15-18, 25, 27, 28, 30, 39, 40, 50-56(even), 57, 73, 77, 92, p. 67.

Evaluation: (Could be from any one/several of the following)
>   Responses from classroom questions
>   Results of classroom sample problems
>   Homework responses
>   Check answer with Calculator
>   End of the section exam

Enrichment: