Inverse of a Relation

- Mapping notation: ______________________________________
  This means that the domain of the original becomes the range of the inverse and the range of the original becomes the domain of the inverse.

- Every relation has an inverse. Inverse of a relation is a “special reflection” of the original relation where the mirror of the reflection is the line ______________ .

- When the inverse transformation is carried out on a function that is one-to-one then the inverse itself is also a function.

  - A one-to-one function passes the horizontal line test.

  - An inverse that is a function is denoted by: _______________________

- Despite of the notation an inverse is very different from a reciprocal.

- It is possible to strategically restrict the domain of the original function so it becomes one-to-one and its inverse is then also a function. This is most commonly done with trigonometric functions.

- In general, the equation of an inverse can be found algebraically by following these steps:

  1. Replace f(x) with “y”.
  2. Swap every “x” with “y” and “y” with “x”.
  3. Solve for “y”.
  4. Use the inverse notation if the resultant relation is also a function.

Example 1: Find the inverse of $f(x) = 0.25x - 5$

Example 2: Find the inverse of $f(x) = 2x^2 + 16x - 5$. Sketch a graph of the original and of the inverse in the same coordinate system.

Inverse of Trigonometric Functions

- As all trigonometric functions are periodic, they are not one-to-one.
- In order for the inverse any trigonometric function to be a function, we restrict the domain of the original in a specific manner.

Original		Inverse	
Domain		Domain	
Range		Range	

Original		Inverse	
Domain		Domain	
Range		Range	

Original		Inverse	
Domain		Domain	
Range		Range	

Original		Inverse	
Domain		Domain	
Range		Range	

Original		Inverse	
Domain		Domain	
Range		Range	

Original		Inverse	
Domain		Domain	
Range		Range	