MAC 1105 Pre-Class Assignment (due 6/10 by 11:59pm):

Inverse of Exponential functions
Read section 4.2 to prepare for class

Now that we have seen the exponential functions, let us focus on a different function that is closely connected to the exponential function.

Is exponential function a one to one function?

So can it have an inverse that is also a function?

The inverse of exponential functions are called the **logarithmic functions**.

Using the properties that we know about the inverse of a function (Refer section 2.7 page 302), can you find the domain and range of logarithmic functions?

If $y = b^x$, we know that inorder to find the inverse we just interchange x and y.

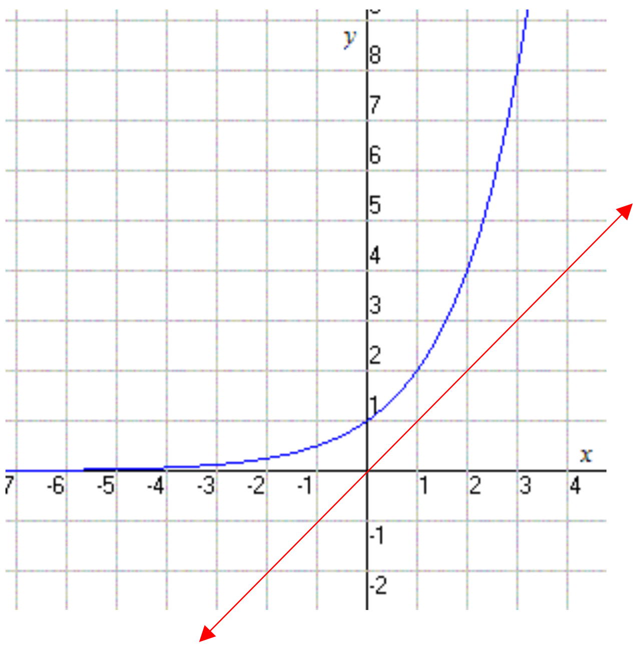
So the inverse of $y = b^x$ is $\boldsymbol{x = b^y}$ which is equivalent to $\boldsymbol{y = log_b x}$ where $x > 0$ and $b > 0,\ b \neq 1$

The function $f(x) = log_b x$ is the **logarithmic function with base b**.

$\boldsymbol{x = b^y}$ and $\boldsymbol{y = log_b x}$ are two different ways of expressing the same thing. The first equation is in **exponential form** and the second equivalent equation is in **logarithmic form**.

Show that $f\left(f^{-1}(x)\right) = x$ *and* $f^{-1}\left(f(x)\right) = x$ *for* $f(x) = b^x$ *and* $f^{-1}(x) = log_b x$.

Graph of $y = 2^x$ is given below. Reflect the graph about the line y=x (its given on the graph)and graph its inverse ***(If necessary refer section 2.7 page 307 to review graphing of function's inverse)***



What is the inverse of $y = 2^x$?

The graph of the inverse of $y = 2^x$ is the graph of $y = log_2 x$