

Math 10a
September 2, 2014
Function Manipulation

1. Solve for x : $6 \cdot 4^x = 12$.
2. Suppose $3(3/2)^x = 4$. Is x bigger than or smaller than 1? Solve for x in terms of logarithms.
3. Let's say a stack of 1000 sheets of paper is 3 inches tall. If I take a sheet of paper and fold it ten times, how thick is the result? The observable universe is about 1.7×10^{28} inches wide. How many times would one need to fold the sheet of paper to be wider than the observable universe?
4. On the homework, this function appears: $\lceil x \rceil$, the smallest integer greater than or equal to x . Draw the graph of this function.
5. Draw the graph of $4e^x - 5$. Label the x and y -intercepts.
6. Draw the graph of $f(x) = \frac{1}{2x+7}$. What is the inverse of f ? For what values is the inverse defined? Draw the inverse.
7. For what values of x is the function $\log(\sqrt{1+x})$ defined? What is its inverse?
8. The function $f(x) = x^2$ is not invertible. Why is this so?
9. But wait, I thought $\sqrt{x^2} = x$ and $(\sqrt{x})^2 = x$, so isn't \sqrt{x} the inverse to x^2 ? (hint: draw the graphs of x^2 and \sqrt{x})