Math 242:   HW 1

Due on Wednesday, June 18

Summer '14

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Problem 1

Show that $f(x) = x^3 + 2$ is a 1-1 function on the interval $(-\infty, \infty)$. What is the range of $f(x)$? Find $f^{-1}(x)$ algebraically and give it's domain and range. Verify that $f(f^{-1}(x)) = x$ and $f^{-1}(f(x)) = x$.

Problem 2

Suppose that g is a 1-1 and differentiable function and that $g(3) = 7$ and $g'(3) = 2$. From this information alone, can we find $(g^{-1})'(3)$ or $(g^{-1})'(7)$? If so, give the value. If not, explain why.

Problem 3

Why do we require a function to be 1-1 in order for it to have an inverse? (1 sentence answer)

Problem 4

State the definition of $\ln(x)$ as an integral. Without taking a derivative, explain why it makes sense that $\ln(x)$ is increasing.