

Written Assignment 7

Due: Wednesday, August 10th

1. Find the equation for $f^{[-1]}(Q)$ or state that f is not one-to-one. If you claim that f is not one-to-one, show at least one computation to justify the claim.
 - (a) $f(t) = 3e^{-2t}$
 - (b) $g(t) = 6 + \log_2(t - 1)$
 - (c) $h(t) = 11 + t^3$
2. The density of a tumor is the ratio of its mass and volume. The mass is constant at 0.2 kilograms. Is this function one-to-one? If so, find the inverse.
3. For the following questions, assume f and g are both one-to-one functions such that
 - the domain of f is $(0, 3)$
 - the domain of g is $[-1, \infty)$.
 - the image of f is $(-\infty, \infty)$.
 - the image of g is $(-2, 2]$.
 - $f(2) = 0$
 - $g(0) = 1$
 - (a) What is the domain of $f^{[-1]}$?
 - (b) What is the domain of $g^{[-1]}$?
 - (c) What is the image of $f^{[-1]}$?
 - (d) What is the image of $g^{[-1]}$?
 - (e) Sketch a possible graph of $f^{[-1]}$ and $g^{[-1]}$.
4. Let $f(t) = \frac{1}{2-t}$. Compute $f^{[-1]}(t)$ and $f(t)^{-1}$. What is the difference between these functions? Are they the same?
5. (Extra Credit) Find as many functions as possible that are their own inverse function. Be sure to show that this is true! More points for more functions.