

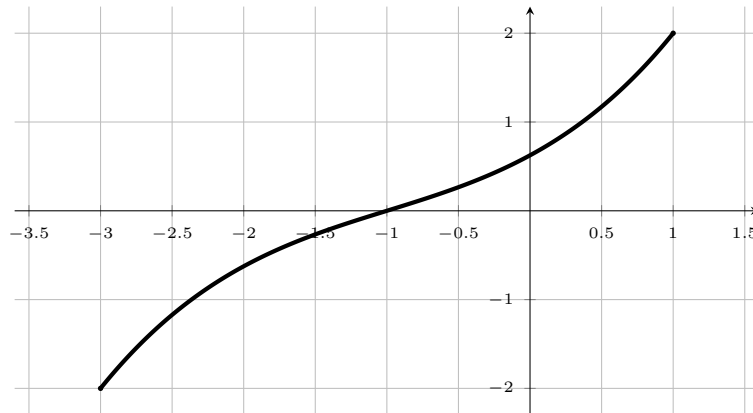
MAT265 HOMEWORK 07

Due Date: March 16, 2016

Name: _____

Instructions: The following exercises are similar to those found in the course text book [related text book question are in brackets]. Show ALL your work and write neatly. This assignment is due at the beginning of the class period on the date above. Group work is allowed and encouraged, but each member must write up his/her own solutions. Submissions without staples, without a name, or without work shown *will not receive credit*.

1. [§3.2, # 2]
 - a. Suppose f is a one-to-one function with domain A and range B . How is the inverse function f^{-1} defined? What is the domain of f^{-1} ? What is the range of f^{-1} ?
 - b. If you are given a formula for f , how do you find a formula for f^{-1} ?
 - c. If you are given a graph of f , how do you find a graph of f^{-1} ?
2. [§3.2, # 16] If $f(x) = \tan(x)$ where $-\frac{\pi}{2} < x < \frac{\pi}{2}$, find $f^{-1}(-1)$ and $f(f^{-1}(\sqrt{3}))$.
3. [§3.2, # 18] The graph of f is given below. Use it to answer parts (a)-(d).



- a. Why is f one-to-one?
 - b. What are the domain and range of f^{-1} ?
 - c. What is the value of $f^{-1}(2)$?
 - d. Estimate the value of $f^{-1}(-0.5)$.
4. [§3.2, # 38] Find $(f^{-1})'(a)$ where $f(x) = \sqrt{x^3 + x^2 + x + 2}$ and $a = 4$.
 5. [§3.2, # 40] Suppose f^{-1} is the inverse function of a differentiable function f , and let

$$G(x) = \frac{1}{f^{-1}(x)}.$$

If $f(3) = 2$ and $f'(3) = \frac{1}{9}$, find $G'(2)$.

6. [§3.3, # 48] Differentiate f and find the domain of f : $f(x) = \ln(\ln(\ln x))$.
7. [§3.3, # 70] Find the ten-thousandth derivative of $f(x) = xe^{-x}$.