Math 131E Fall, 2021
Krantz October 28, 2021

PRACTICE EXAM FOR FIRST MIDTERM

(9 points) **1.** Write the domain of each function

(a) $f(x) = \sqrt{1 - x^2}$

(b) $g(x) = 1/(1 - x^2)$

(c) $h(x) = \tan x$

(10 points) **2.** Solve the equation

$$\ln(x^2 - 2) = 4$$

for x.

(12 points) **3.** Let $f(x) = x^2 + x$ for $x \geq 0$. Calculate f^{-1}.

(10 points) **4.** Let $h(x) = \sin x$, $g(x) = 1 - x^2$, $f(x) = e^x$. Write the function $m(x) = f \circ g \circ h(x)$ explicitly.

(10 points) **5.** Use a limit to calculate the derivative of the function $f(x) = x - x^2$.

(10 points) **6.** Find the tangent line to the curve $g(x) = x^2 + x$ at the point $(1, 2)$.

(10 points) **7.** Calculate the derivative of $f(x) = \sin(\sqrt{x + x^2})$.

(10 points) **8.** Calculate the derivative of $h(x) = x^2 \cdot \cos x$.

(9 points) **9.** Calculate the derivative of

$$k(x) = \frac{x^2 + x}{\sin x}.$$

(10 points) **10.** Calculate the derivative of $m(x) = \sin(x^3 - x^2)$.