

► Print your name here: _____

Grading

► Please circle your section:

1

(1) T 1:30 Gilman 17 Ariturk, Sina

(2) T 3:00 Hodson 210 Tran, Timothy

2

(3) Th 1:30 Maryland 309 Ravit, Jason

3

(4) Th 3:00 Hodson 316 Tran, Timothy

► Write out and SIGN the pledge:

4

I attest that I have completed this exam without unauthorized assistance from any person, materials, or device.

Total:

Signature:

Date:

► This is a 50 minutes in-class closed book exam. No notes, books, or calculators are allowed.

► This examination booklet contains 4 problems, on 6 sheets of paper including the front cover. Please detach the last page, which is intended for use as scrap paper.

► Show all work. Don't use any techniques that haven't been covered in class yet. The correct answer is worth no points without any argumentation.

1 (40 pts.) Evaluate the following limits (if there is no limit, state "no limit" together with a reason).

a) $\lim_{x \rightarrow 0} (\cos x - (x + 2)^3)$

b) $\lim_{x \rightarrow \infty} \frac{x^3 + 100x^2 + x}{5x^5 + 2x^2 + 2}$

c) $\lim_{x \rightarrow 1} \arcsin\left(\frac{\sqrt{x}-1}{x-1}\right)$

d) $\lim_{x \rightarrow \infty} (\sqrt{x^2 - 1} - x)$

2 (20 pts.) Find asymptotes (horizontal and vertical) for the function

$$f(x) = \begin{cases} 1 - \frac{1}{1+x} & x < -1 \\ \tan \frac{\pi x}{2} & -1 < x < 2 \\ \frac{1}{x^2} & x > 2 \end{cases}$$

3 (20 pts.)

For the following functions $y = f(x)$, determine if it is invertible. If not, explain the reason, if yes, find the inverse function $y = f^{-1}(x)$.

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

b) $f(x) = \frac{1}{\sqrt{x-1}}$

4 (20 pts.) Determine (the equation of) the tangent line to the curve $y = x\sqrt{x}$, that parallel to the line $2y = 3x + 10$. At which point does this tangent line touch the curve? Write out the equation of the normal line through this point.

This page is intended for use as scrap paper.