MATH 141 (Section 1 & 2) University of South Carolina
Prof. Meade Fall 2004

Exam 1 – Practice Name: _____
September 15, 2004 SS #: _____

PRACTICE

Instructions:

1. There are a total of 7 problems on 6 pages. Check that your copy of the exam has all of the problems.
2. Calculators may not be used for any portion of this exam.
3. You must show all of your work to receive credit for a correct answer.
4. Your answers must be written legibly in the space provided. You may use the back of a page for additional space; please indicate clearly when you do so.

Problem	Points	Score
1	15	
2	16	
3	16	
4	18	
5	8	
6	12	
7	15	
Total	100	

Good Luck!

1. (16 points) Short Answer. *Fill in the blank with the word, equation, or short phrase that best completes each statement.*

   (a) The natural domain of $f(x) = \sqrt[3]{x^2 + 4x + 3}$ is _____.

   (b) The limit $\lim_{t \to 0} \frac{\sin t}{t}$ cannot be evaluated by substitution because _____ _____; the value of $\lim_{t \to 0} \frac{\sin t}{t}$ is _____.

   (c) If $\lim_{x \to \infty} f(x) = 6$, then the line _____ is a _____ asymptote of the graph of $y = f(x)$.

   (d) If $\lim_{x \to 6^+} f(x) =$_____, then the line _____ is a vertical asymptote of the graph of $y = f(x)$.

2. (16 points) Use the equation $y = 1 - \sqrt{x}$ to answer the following questions.

   (a) For what values of x is $y = 4$?

   (b) For what values of x is $y = 0$?

   (c) For what values of x is $y \geq -3$?

   (d) Does y have a minimum value? A maximum value? If so, find it. If not, explain why not.

PRACTICE

3. (15 points) Find the natural domain of each of the following functions.

(a) $f(x) = \dfrac{x^2 - 4}{x - 2}$

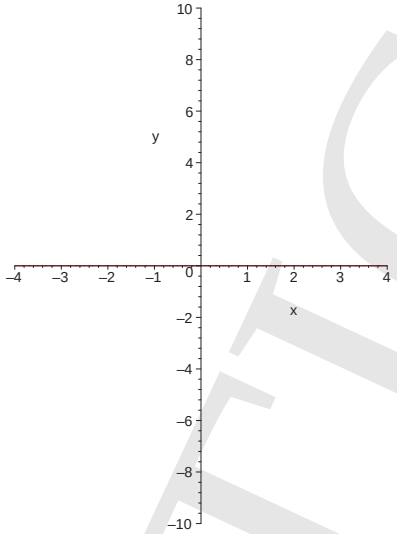
(b) $g(\theta) = \tan(\theta)$

(c) $h(t) = \sqrt[4]{x^2 - 4}$

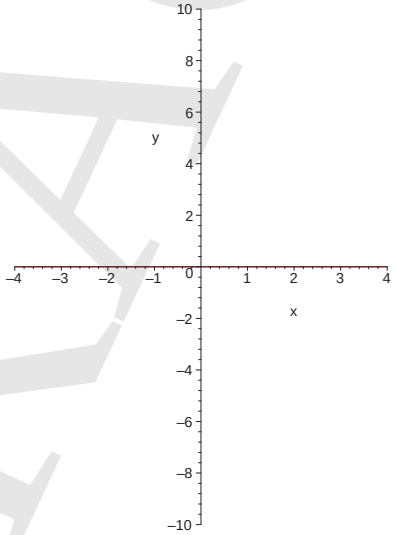
PRACTICE

4. (18 points) Sketch the graph of the following functions on the axes provided.

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



(b) $f(x) = 3 + |x + 1|$



PRACTICE

5. (8 points)

(a) Consider the parametric curve with $x = 16t^2 - 9$ and $y = 3t + 4$. Express this curve in the form of either $y = f(x)$ or $x = g(y)$.

(b) Find parametric equations for the portion of the circle $x^2 + y^2 = 1$ that lies in the second quadrant, oriented counterclockwise.

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6. (12 points) For the function F graphed below, find

   (a) $\lim_{x\to 0} F(x)$

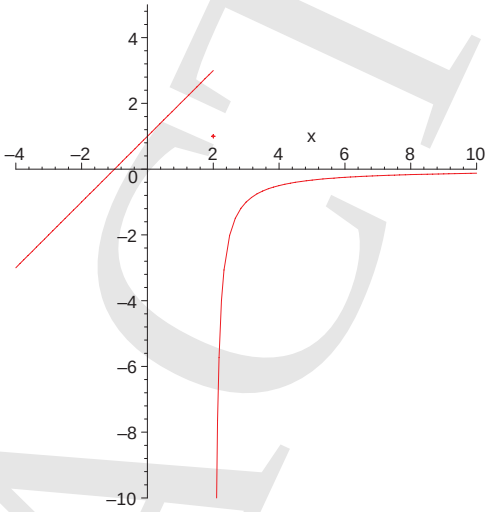
   (b) $\lim_{x\to 2} F(x)$

   (c) $\lim_{x\to 2^-} F(x)$

   (d) $\lim_{x\to 2^+} F(x)$

   (e) $\lim_{x\to \infty} F(x)$

   (f) $\lim_{x\to -\infty} F(x)$



7. (15 points) Find the limits.

   (a) $\lim_{x\to 0} \dfrac{3x+1}{2x-5}$

   (b) $\lim_{y\to 6^+} \dfrac{y+6}{y^2-36}$

   (c) $\lim_{x\to \infty} \dfrac{3x+1}{2x-5}$

   (d) $\lim_{u\to 1} \dfrac{u-1}{u^2+1}$

   (e) $\lim_{u\to -\infty} \dfrac{u-2}{u^2+2u+1}$

PRACTICE