

MAT 131

FALL 2012

PRACTICE MIDTERM I

NAME :

ID :

RECITATION NUMBER:

THERE ARE SIX (6) PROBLEMS. THEY HAVE THE INDICATED VALUE.

SHOW YOUR WORK

DO NOT TEAR-OFF ANY PAGE

NO CALCULATORS NO CELLS ETC.

ON YOUR DESK: ONLY test, pen, pencil, eraser.

1		40pts
2		40pts
3		40pts
4		50pts
5		40pts
6		40pts
Total		250pts

!!! WRITE YOUR NAME, STUDENT ID AND LECTURE N. BELOW !!!

NAME :

ID :

LECTURE N.

1.

(a) State the vertical line test.

(b) Does the graph of the curve $x = y^2$ with $y \geq 1$ pass the test?

(b) Does the graph of the curve $x = y^2$ with $y \leq 1$ pass the test?

2. You leave Detroit at 5:00pm and drive at constant speed west on I-96. You pass Ann Arbor, 40 mi from Detroit, at 5:15pm.

(a) Express the distance traveled in terms of the time elapsed.

(b) Draw the graph of the equation in part (a).

(c) What is the slope of this line? What does it represent?

(d) Explain why we all know you were not driving a (non-souped-up) Honda Fit.

4

3.

(a) Find the radians measure of 133° .

(b) Express 4 radians in degrees.

(c) Find the length a of the arc on a circle of radius r subtended by a central angle of θ radians.

4.

(a) Find the domain of the following function.

$$f(t) = \sqrt{4 - 2^t}$$

(b) The graph of the function $f(x) = Ca^x$ passes through the points $(2, 20)$ and $(5, 160)$. Calculate the values of a and C .

(c) Plot, on the same diagram, the graphs of the following functions:

- $f(x) = 2^x$
- $f(x) = e^x$
- $f(x) = 5^x$

6

5.

(a) Compute $\log_{10} 125 + \log_{10} 8$.

(b) Explain what it means to say the function f with domain A and range B is *one-to-one*.

(c) Calculate the inverse of the following function:

$$f(x) = 2 + \sqrt{3 + 5x}$$

6.

Consider the function $f(x) = x^2$ and let P be the point $(3, 9)$ on the graph of f .

(a) For each of the following choices of x , compute the slope m_{PQ} of the secant line between P and $Q = (x, f(x))$. Hint: $x^2 - a^2 = (x + a)(x - a)$.

x	2.5	2.9	2.99	3.01	3.1	3.5
m_{PQ}						

(b) Using the answers you obtained (i.e without using limit laws or derivatives), guess the slope of the tangent of the function f at $(3, 9)$.

(c) Assuming this guess is correct, give a formula for the tangent of the graph at $(3, 9)$ in the form $y = mx + c$.

