

Math 150 – Chapter 3  
Exam 2 Review Sheet  
Professor Busken

Name: \_\_\_\_\_

Directions: **Work Together!** Do not try to cram the full solutions to each question onto this paper!!! Write your extended solutions on different paper! Working only these practice problems is insufficient preparation for the exam.

1. Find the  $x$  values, if any exist, at which  $f(x) = \frac{\sin(x - 2\pi)}{x - 2\pi}$  is not continuous. Describe each discontinuity.

For questions 2—12, find  $\frac{dy}{dx}$ .

2.  $y = 3e^{2x} + \frac{5}{x^4} - \sqrt[5]{x^3}$
3.  $y = (1 + 4x)^5(3 + x - x^2)^8$
4.  $y = \cos(\tan(x))$
5.  $y = \frac{3x - 2}{\sqrt{2x - 1}}$
6.  $y = 10^{1-x^2}$
7.  $y = \cos\left(\frac{1 - e^{2x}}{1 + e^{2x}}\right)$
8.  $y = \ln(\csc(5x))$
9.  $x^2 \cos(y) + \sin(2y) = xy$
10.  $y = \ln(x^2 e^{3x})$
11.  $y = \sqrt{\tan^{-1}(x^2)}$
12.  $y = \ln\left[\frac{(2x + 1)^3}{(3x - 1)^4}\right]$

For questions 13—14, use logarithmic differentiation to find the derivative of the given function.

13.  $y = e^{x^2} \sqrt{x} (x^2 + 1)^{10}$
14.  $y = (\ln x)^{\cos(x)}$
15. Find a parabola  $y = ax^2 + bx + c$  that passes through the point  $(1, 4)$  and whose tangent lines at  $x = -1$  and  $x = 5$  have slopes 6 and  $-2$ , respectively.
16. If an object of mass  $m$  has velocity  $v$ , then its kinetic energy,  $K$ , is given by  $K = \frac{1}{2}mv^2$ .  
If  $v$  is a function of time,  $t$ , use the chain rule to find a formula for  $\frac{dK}{dt}$ .