

MAT265 HOMEWORK 06

Due Date: March 2, 2016

Name: _____

Instructions: The following exercises are similar to those found in the course text book [related text book question are in brackets]. Show ALL your work and write neatly. This assignment is due at the beginning of the class period on the date above. Group work is allowed and encouraged, but each member must write up his/her own solutions. Submissions without staples, without a name, or without work shown *will not receive credit*.

1. [§2.8, # 22] A circular disk has radius 40 centimeters and the maximum error in this measurement is 0.3 centimeters.
 - a. Use differentials to estimate the maximum error in the calculated area of the disk.
 - b. What is the relative error? What is the percentage error?
2. [§2.8, # 24] Use differentials to estimate the amount of chocolate needed to make a hollow sphere of chocolate that is 2.5 mm thick with inner diameter 40 mm. Recall that the Volume of a sphere is given by $V = \frac{4}{3}\pi r^3$.
3. [§2.8, # 30] Suppose that we don't have an exact formula for $g(x)$, but we know that $g(3) = 7$ and $g'(x) = \sqrt{x^2 + 2x + 3}$.
 - a. Use a linear approximation to estimate $g(2.9)$ and $g(3.05)$.
 - b. Are your estimates in part (a) too large or too small? Explain.
4. [§3.1, # 14] Starting with the graph of $y = e^x$, find the equation of the graph that results from
 - a. reflecting about the line $y = 2$.
 - b. reflecting about the line $x = 4$.
5. [§3.1, # 16] Find the domain of $g(t) = \sin(e^{-t})$.
6. [§3.1, # 24] Find the limit $\lim_{x \rightarrow \infty} e^{-x^2}$.
7. [§3.1, # 26] Find the limit $\lim_{x \rightarrow \infty} \frac{2 + 10^x}{3 - 10^x}$.