Math 126 Calculus I Homework Week I Tinsley

Instructions: You should do each of the following problems. However, turn in only the underlined exercises. Each assignment is due at 4:00 PM on the indicated day. You may turn in an assignment one day late and incur a 10% penalty. If you get behind, please let me know.

I mark with an asterisk those exercises that are of some extra importance. However, do not turn in written solutions for these exercises.

You may discuss daily homework with others. Copying solutions from another student or source constitutes an Honor Code violation. In particular, **any use of a solutions manual, website, or similar resource to assist with your written assignments constitutes an Honor Code violation**. I strongly suggest the following (or a similar) routine:

i. Try each of the exercises on your own.
ii. Discuss difficulties with others.
iii. Retire somewhere to write the solutions on your own.

The written assignments are not lengthy. Therefore, I expect the solutions to be written with considerable care. If your work is sloppy or unclear, we will deem the assignment unacceptable. **Always** indicate how you obtained your answers; show important work.

Reading assignments are due at the beginning of class on the listed day (unless otherwise indicated). I encourage you to answer the Preliminary Questions at the beginning of each section and then check your answers against those in the back.

Monday, Week 1
Reading (by 1:30 PM): sections 1.1; 1.2; 2.1(up to "Other Rates of Change")
Exercises: (by 1:30 PM): Preliminary Questions 1, 3, 5, 6 section 1.1

Tuesday, Week 1
Reading (by 9:00 AM): sections 1.3, 1.4, 1.5; finish section 2.1; section 3.1
Exercises (by 4:00 PM)
(1.1) 3, 7, 9, 11, 15, 21, 27, 35, 39, 43, 45, 59, 61, 63, 65, 71
(1.2) 1, 3, 9, 11, 19, 21, 29, 31, 37
(2.1) 1, 3, 5

Wednesday, Week 1
Reading: by 9:00 AM): sections 1.6(up to Hyperbolic Functions), 1.7; 2.2, 2.3; 3.2 (up to "The Number e")
Exercises: (by 4:00 PM)
(1.3) 1, 2, 8, 9, 13, 15, 17, 27, 28
(1.4) 7, 8, 15, 21, 22, 30
(1.5) 1, 2, 10, 11, 23, 27, 29, 31, 33
(2.1) 11, 12, 19
(3.1) 1, 2, 3, 4, 7, 8, 9, 10

Thursday, Week 1
Reading: sections 2.4-2.6; finish section 3.2
Exercises:
(1.6) 3, 5, 11, 12, 13, 24, 25, 28
(1.7) 1, 3, 5
(2.2) 2, 7, 8, 21, 26
(2.3) 13, 16, 24
(3.1) 15, 16, 25, 26
(3.2) 5, 6, 9, 14, 17, 20, 23, 25, 27

Math 126 Calculus I Revised Homework Week I Tinsley

*The problems marked with an asterisk are not to be turned in but are very important.

Friday, Week 1
Reading: sections 3.3, 3.4(Marginal Cost in Economics), 3.5

(2.4) 1, 2, 3, 4
(2.5) 1, 3, 5, 6, 11, 14, 17, 20
(2.6) 1, 2, 9, 11, 12
(3.2) 35, 36, 39, 41, 47, 49

Monday, Week 2
Reading: Finish section 3.4; Sections 3.6-3.8
Exercises:
(3.2) 50*
(3.3) 1, 2, 3, 6, 7, 10, 17, 18, 23, 49, 50
(3.4) 43, 44*, 45
(3.5) 1, 3, 5, 13, 14(Whew!)*, 39

Extra Credit: Due Monday of Week 3 at 9:00 AM.

A. Let $\mathbf{f(x) = x^{\frac{1}{4}}}$. Find $f'(x)$ **algebraically directly from the limit definition** of the derivative. You may not use derivative formulas.

B. Let $f(x) = \begin{cases} x^2 \sin\left(\frac{1}{x}\right) & \textbf{for } x \neq 0 \\ 0 & \textbf{for } x = 0 \end{cases}$

See figure 5 on p. 73, figure 3 on p. 99, and figure 12 on p. 138 for related examples.

(1) Argue that $f(x)$ is continuous everywhere.
(2) Is $f(x)$ differentiable at x = 0 ? See section 2.3 (Example 6 and Figure 6) for some helpful ideas. Verify your answer using the limit definition.