

Calculus 1A: Homework Assignments. Notes and Hints.

Revised 1/19/09

Spring 2009, TT 3:30pm - 5:00pm, Room 105 Stanley Hall

Instructor: Professor Zvezdelina Stankova

HW6. Read §3.5-3.9. Solve and Write Problems:

- (1) §3.5: #38,42,48(a):
 - (a) #38-42: use the chain rule twice.
 - (b) #48(a): we are interested in what happens nearby point $(1, 1)$, i.e., $a = 1 > 0$, so in your formula for y you can safely drop the absolute value as $|x| = x$; write a word to that effect so that the graders know why you did that.
- (2) §3.6: #29,35,42,44: as usual, you must explain your answers and show all calculations.
- (3) §3.7: #2,4,8,16,24,34,40,48.
 - (a) #2: pick one of the functions and sketch the graph of its derivative to see which other given graph matches it; if no other graph matches it, then your function must be f''' ; explain in words what you are doing and how you come up with your choices.
 - (b) #4: same problem, except that they have named the first three derivatives by velocity, acceleration and jerk (see textbook for definition of "jerk".)
 - (c) #8,16,24: remember that there are no formulas to find directly the higher derivatives of a function; thus, always find the first derivative, then the second derivative from the first derivative, and so on depending on which derivative the problem asks for.
 - (d) #34,40: experiment with the first several derivatives until you see a pattern and are fairly certain that the pattern will continue to hold; explain and write all intermediate calculations and cases on which you base your formula; no need to prove your conjectured formula unless you really want to practice the "domino effect" idea (mathematical induction) from "Principles of Problem Solving" right before Chapter 2.
 - (e) #48, obviously, you have to find a formula for the acceleration (after finding a formula for the velocity!), set it equal to 0, solve for t , and then plug this value of t in $s(t)$ and in the velocity $v(t)$.
- (4) §3.8: #28,46,47. #47: as usual, you must explain your answer and show all calculations.
- (5) §3.9: #30, 32, 40*. Keep in mind that, as with the trig. functions, I don't require you to know $\operatorname{sech} x$ and $\operatorname{csch} x$, so convert everything into $\sinh x$, $\cosh x$, $\tanh x$ and $\coth x$.