

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

HW9. Read §4.4-4.5. Solve and Write Problems:

- (1) §4.4: #6,10,12,18,22,24,26,28,30,32,36,40,42,44,46,48,50,60. Make sure that you justify on your HW the use of L'Hospital's Rule **before** you apply it, e.g., $0/0$ or ∞/∞ .
- (a) #6: you may want to do this problem in two different ways: by LH, or by factoring and cancelling.
 - (b) #10: be careful!! The solution may turn out to be simpler than you think! Splitting into "guilty" and "non-guilty" parties could be helpful here. There is a way to do this problem even without LH!
 - (c) #18: " $\ln(\ln(\infty))$ " = " $\ln(\infty)$ " = ∞ ; do you need to apply LH in #18 twice, or just once will suffice?
 - (d) #22,24,26,28: you may have to apply LH 2 or 3 times in each problem, so don't give up! As a rule of thumb, every time you apply LH, if possible, simplify/rewrite the resulting quotient before attempting to apply LH again.
 - (e) #30: if you have trouble with m and n , first try the problem when, say, $m = 5$ and $n = 7$, and then repeat your solution with the letters m and n instead of 5 and 7 - these will simply be some constants, whose exact values you don't know.
 - (f) #32: one LH will do the job; apply LL immediately to get the final answer.
 - (g) #44: be careful! Are they trying to trick you?
 - (h) #48-50, you have to put the fractions under a common denominator **before** you attempt to apply LH.
 - (i) #60: you obviously have to rewrite the indeterminate power as an exponential function (compare with Ex.9).
- (2) §4.5: #12,14,16,30,64,70,72. In many of the problems, note that your function $f(x)$ is a fraction of two polynomials; so when finding its derivatives, do **not** multiply out the denominators; instead, first cancel stuff and factor the numerator as much as possible **before** multiplying out stuff in the numerator. When justifying vertical asymptotes, use the LLs with appropriate $a+$ and $a-$. When justifying horizontal asymptotes, you may use either the factoring trick of highest power of x from top and bottom, or LH - whichever applies, but be careful to check if LH indeed applies!! When finding slant asymptotes, you may use shortcuts discussed in the class and sections.