

Calculus 1A: Homework Assignment 3. Notes and Hints

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

Instructor: Professor Zvezdelina Stankova

HW3. Read §2.5-2.7. Solve and Write Problems:

(1) §2.5: #44,46,48,52(a),54(a).

(a) The hypothesis of a theorem includes all conditions of the theorem, i.e., things coming after expressions like "let", "suppose", "assume", "if", "given", "provided", etc. The conclusion of a theorem is what the theorem claims will be true provided all conditions in the hypothesis are satisfied. The conclusion usually comes after expressions like "then", "therefore", "hence", "it follows that", "this forces", "this implies", etc.

(b) #44: look at your class notes from the IV theorem for examples of functions which do not satisfy some conditions and for them the conclusion of IV theorem fails; and for other examples of functions which do not satisfy some conditions, but the conclusion of IV theorem holds for them nevertheless. In both cases, regardless of the outcome (conclusion is false or it holds) we say that "IV theorem is not applicable" since some conditions in the hypothesis are violated. The only time we can apply a theorem is when all conditions in the hypothesis are satisfied: then the conclusion of the theorem will hold no matter what function you are considering (as long as it satisfies the hypothesis.)

(c) #48-50: you have to show that an equation has a solution. Follow the example from lecture.

(2) §2.6: #4,6,14,16,18,26,40,52,66.

(a) #14: factor out x^3 from top and bottom, then cancel, and finally apply limit laws. In #26: "rationalize" the numerator. #14-26: follow the instructions that they give in the beginning of the problem; it is **not** to use ϵ/δ definitions here!

(b) #66: try to sketch the graph of the function when, say, $x > 10$; here you have an ϵ -goal and an N -answer.

(3) §2.7: #4(a)(b),6,8,10,12,14