

Address to my students (23.9.1986)

I was alarmed when I learned the other day that on the problem of the chords in the circle --EWD979-- some of you had spent perhaps more than 24 hours. I am all in favour of dedication, enthusiasm, fascination and all those good things, but honestly, Ladies and Gentlemen, it was not my intention to inflict such a long (and probably vain) struggle upon any of you.

Technically, this course deals with two distinct topics: the structure or shape of really sweet arguments, and the heuristics of designing such really sweet arguments. These are two totally different topics, and it is hard to be very explicit about the heuristics before we have a clear picture of the sweetness we are aiming for. I cannot deal with everything simultaneously. I gave you the problem before I had given you any advice in avoiding unproductive labour. I am sorry and apologize. I do hope, however, that the many hours some of you have spent on this problem have not been wasted: they should have driven home the message that, if you would like to become a more effective mathematician, there is something to be learned.

The most helpful thing I can do at this stage is probably to relay to you the advice I got from my mother --an accomplished mathematician-- at the age of 16. During the Summer Holiday I bought my books for the next year, among which a book on trigonometry. All the formulae with all those Greek letters somewhat frightened me, and I asked my mother, whether trigonometry was difficult. "Oh no," she said, "learn the standard formulae as well as you learned the multiplication tables, and, never forget: if you need more than five lines, you are on the wrong track." I think it is only fair to tell you that probably no other remark has made such a profound influence on me as a mathematician; I am a great lover of the solution that fits on the proverbial back of an envelope, and, unless stated otherwise, all problems I give you have such a solution.

At this stage I can give you some behavioural advice. Contrary to what misguided --and misguiding-- educationists may have told you, don't waste your time looking at specific examples. Trying to come to grips with a large set by looking at a few --hopefully representative-- elements of that set is one of the most ineffective ways of spending one's time. Go immediately for the general case, or, in other words, attack the set not by looking at specific elements but by analysing the definition of the set.

The second advice is never to resort to mechanical aids like pen and paper without feeling slightly guilty. Postpone that stage as long as possible, and if you have to resort to those aids, don't make a picture --because pictures, unless very carefully designed, are more misleading than helpful-- and don't scribble. Write slowly and as beautifully as you can, and as little as possible; if you still write too much, try writing with your other hand. You see, the only reason for writing symbols on paper is to let them do the work! The side-effect of postponing the use of pen and paper as long as possible is that by doing so you force yourself to explore the simple possible solutions first.

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