

PRACTICING WHAT YOU PREACH

OR

~ ("DO AS I SAY, NOT AS I DO!")

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Let me share some problems with you.

1) Show:
$$\int_0^{\infty} \left[\ln \left[\frac{x}{x+a} \right] \right]^2 dx = \frac{a\pi^2}{3}$$

2) *Swimming Pool Problem:* You are to cover a 42' diameter swimming pool so that the cover sags 2' in the center. What is the length of the cover from rim to rim?

3) *Golf Problem:* 16 people are to play for 5 days, 4 foursomes per day. Each person is to play with each other exactly once. Determine how this may be done.

What goes through your mind when you read these problems? I hope that you are not intimidated by them. You may not remember all of your calculus needed to solve some of them, but should this forgetfulness make you feel inadequate to attempt a solution? Certainly not!

I am very concerned, however, that during the course of my high school teaching career, I have had the word "*dumb*" used twice in conversation with me. Once was with respect to a department meeting and once again when I was putting a 'problem of the day' in the teachers' mailboxes. The only response was the statement (in all innocence), "Are you trying to show how smart you are or how dumb we are?" Of course, neither, but how hurt I was that someone's attitude toward problem solving was that of apprehension and suspicion instead of viewing seeking a solution as a chance to do some mathematics. This after having taught at the college level where faculty seminars and colloquia were a way of academic life.

I have a philosophy that if students do not see a teacher practice what s/he preaches, then what reason do they have to listen to a teacher preach? Thus, for example, music teachers should play music; art teachers should exhibit in public art shows; literature teachers should be publishing or *be seen* reading. In other words, a teacher should participate in the field in which s/he teaches! Our principal recently sent out a memo with the sage advice, "If you don't *do* it, you don't *believe* it." How true. If we are to develop mathematical power in our students, as the NCTM Curriculum and Evaluation Standards (*Standards*) is proposing, then it had better start with us.

Teachers at all levels of mathematics must be comfortable with mathematics in order to develop their own power to pass this attribute on the students. It is disheartening to hear (as I have) an elementary teacher say, "I hate math!". It appears that before we try to sell mathematics to our students, we must be sold on it ourselves!

I've read an article showing that a group of education majors did not have a grasp of the concept of "zero". Another stated that junior high teachers could get by with a minor or less in mathematics. I know of a teacher who got very frustrated in the classroom one day and told the students, "Don't ask me any question I can't answer!". Given this set of circumstances, are high school teachers unwilling to put their mathematical knowledge on the line and in the open, even in front of the students? Is this the reason some teachers are locked into the textbook, and thus reluctant to do mathematics?

The *Standards* are portraying a new attitude about teaching and learning – a classroom where the teacher becomes a FACILITATOR while the students become the DOERS! Paul Halmos stated that

A teacher who is not always thinking about solving problems – ones he does not know the answer to – is psychologically not prepared to teach problem solving to his students. [Halmos, p. 322].

Teachers of all levels must be familiar enough with mathematics and the applications of mathematics in order to convey its beauty, interest, and utility to students.

I would like to leave you with two questions which I think teachers of mathematics must answer before they can be serious about their teaching. "What does **mathematics mean to me?**" The second question deals with a question often

posed by the students. "When am I ever gonna use this stuff?" I don't believe most teachers can, or even should, answer for anyone but themselves. Thus, every teacher of mathematics should ask him/herself, "**When do I use this stuff?**"

To be ignorant of many things is expected.
To know you are ignorant of many things is the beginning of wisdom.
To know a category of things of which you are ignorant is the beginning of learning.
To know the details of that category of things of which you were ignorant is to no longer be ignorant.

Phenella in *The Unwritten Comedy*
[Duncan, p. 220]

Bibliography

Duncan, Ronald and Weston-Smith, Miranda (Ed.). *The Encyclopedia of Ignorance*. New York: Pocket Books, 1977.
Halmos, Paul R. *I Want to be a Mathematician*. New York: Springer Verlag, 1985.

NOTE: I wish to thank the referees for their valuable assistance in suggesting certain modifications of this article.



Teachers in the Anchorage, Alaska, area created these addition cryptarithms. One answer for each is given on page 29. You are welcome to submit other answers for these or to create new cryptarithms of your own. Ask your students to help.

<u>NO</u>	<u>CAN</u>	<u>CALL</u>	<u>NO</u>	<u>HOW</u>
<u>NO</u>	<u>YOU</u>	<u>HOME</u>	<u>WAY</u>	<u>COME</u>
SAM	SEE	SOON	JOE	RICK
Peggy Frost	Ed Sievert	Kathie Maloney	Rick Volk	(Joe K.)