

User-Friendly Mathematics

From publishers' catalogues of books on computing I have learned that the greatest recommendation nowadays is that the texts are void of any form of mathematical rigour, precision, or clarity.

Obviously, traditional mathematical texts are the pinnacle of user-unfriendliness, and if the mathematical community does not want to get completely out of touch with the real world, it had better do something about it. Here is my modest contribution.

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Hi folks! This is about the theorem of Pythagoras (read: "pythagoras"). Though he is already dead and was Greek, he was in fact quite modern. He is best known for having founded a new sect that meditated on the beauty and harmony of shapes, numbers, and guitar music. (And you all like sects with guitar music, don't you?)

For a long time he meditated on a triangle with sides 3, 4, No, let me give you a simpler explanation. It is really quite simple: for years, even stupid Egyptian farmers could use it to give their lots right angles. (You have heard of Egyptians, haven't you? They build those queer pyramids full of mystical measures. And those pyramids have right angles

too!) The farmer would take three pieces of rope, one of 3 yards, one of 4 yards, and one of 5 yards, and he would tie them together. And then he would give three of his children each a knot and tell them - in Egyptian, of course - to pull and stretch the ropes as much as they could. (In former days, dads could not do their own work and wanted their kids to help them!)

Now that's the figure Pythagoras pondered about from the moment he had seen that the squares of the sides were equal. (If you are not sure about the squares of the sides, ask your mom. She may still know, and if she does not, don't bother, for then it is evidently not that important. The important thing to remember is that the sides have a relationship.)

When Pythagoras discovered that the relationship did also hold for other triangles, you can imagine how excited he became! (Remember he was Greek.) When he had discovered his theorem, he was, in fact, so excited that he shouted "Eureka" - that is Greek too, though the Greeks still don't know how to write it with proper letters - and named the theorem after himself. So much for the theorem of Pythagoras and its discovery.

The important thing, of course, is how we, modern young people, incorporate it into our sense of well-being and our place in the real world. The most important thing is that we learn not to be as over-awed as Pythagoras, whose sense of wonder mainly derived from the fact that he did not understand like us what he was doing. Today we should no longer ignore the possibility that the theorem is false because

- (i) the ropes had the wrong lengths or one of the kids pulled harder than the other two;
- (ii) the angle was not as right as Pythagoras had assumed;
- (iii) mom has made a mistake in calculating the squares;
- (iv) our supposedly straight lines are actually curved (see the lesson "How Relativity made Einstein").

Exercise Explain in your own words why Pythagoras got so excited.

Plataanstraat 5
5671 AL NUENEN
The Netherlands

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prof. dr. Edsger W. Dijkstra
Burroughs Research Fellow