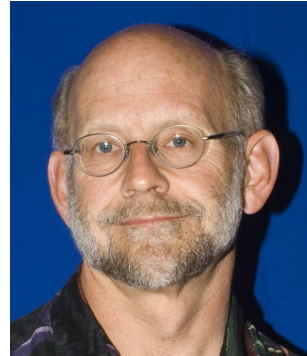


My name is Tom Davis and I will be leading Teacher's Circle sessions on Symmetry and on Visualizing Algebra. Attached are a few problems to show you the sorts of things we'll be looking at together.



I have a BS from Caltech and a PhD from Stanford, both in mathematics. I'm not a pure mathematician, however: I did a post-doc at Stanford in electrical engineering. I left Stanford to help found Silicon Graphics where I worked for 16 years as a graphics software engineer. Thus I tend to look at mathematics from a very practical point of view.

I have taught mathematics for a few years in various colleges, and have done a lot of volunteer mathematics teaching and coaching, mostly of high school and middle school students. I have also been active in the Bay Area mathematical circles for eight years.

I hope that in this Teacher's Circle, I can show you how to generate excitement in your students when they learn new strategies and techniques for solving problems where the answer is not just obtained from a formula in a book.

1. Without doing any algebra, why is the following equation *obviously* wrong?

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 3bc + 2ac$$

2. What does Figure 1 have to do with the previous problem?

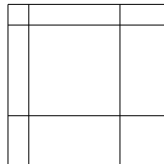


Figure 1: Squaring figure

3. If a , b and c are real numbers, how does the problem of finding all x and y such that $x^2 + y^2 = 1$ and $ax + by + c = 0$ relate to figure 2?

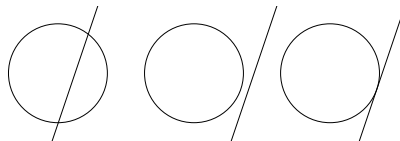


Figure 2: Circle and line