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How do I teach math classically?

This is one of the biggest questions in the classical renewal, so I wanted to write a (very) brief overview of what classical mathematics looks like. 🧵



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Modern Math

First, we need to understand the philosophical underpinnings of mathematics today. Modern math is predicated on the concept of symbol: in other words, the math language is inherently representative. Number does not refer to concrete ideas; number is itself symbolic.

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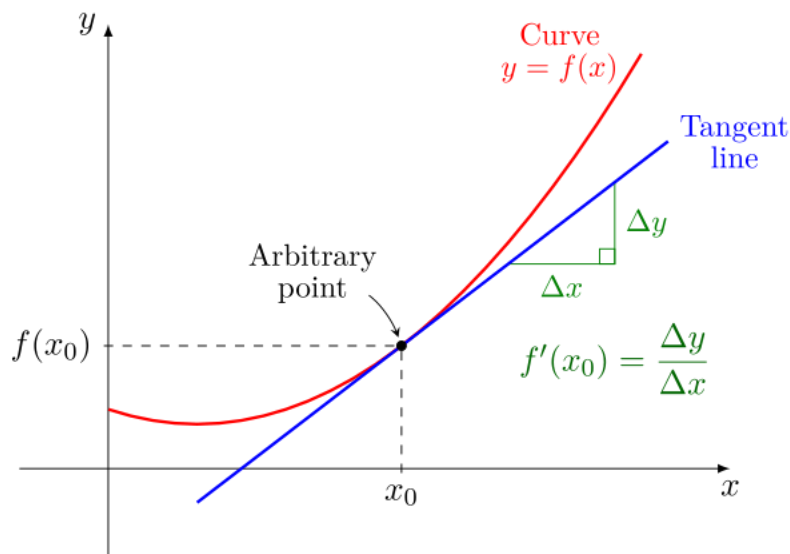


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This is the beginning of algebraic thought. x represents any number, and number is symbolic for anything we might count. In advanced math, we are simply calculating numbers that may or not be applied to the physical world.



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Modern math is divided into many different subject areas, but each has algebra as the common denominator. (No pun intended) Modern math utilizes an inherently algebraic understanding, language, and framework.

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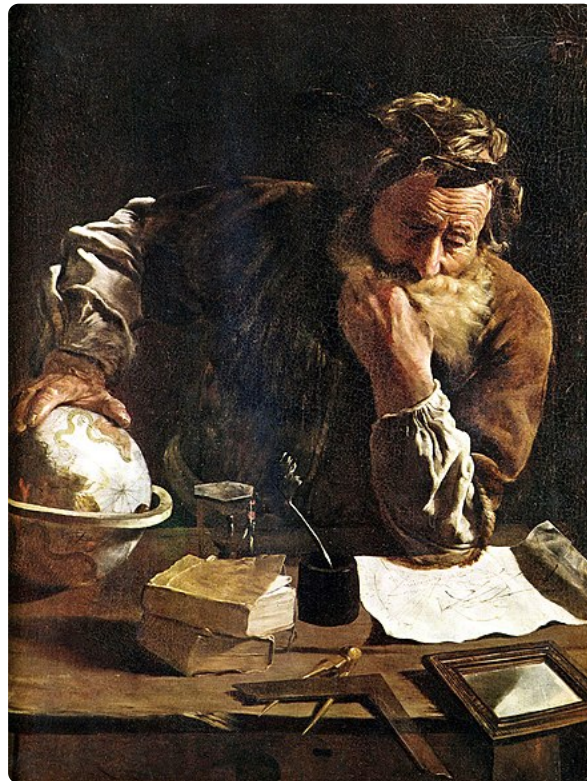
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Classical Math

Classical math is based on the idea that number is itself real. When we study math, we contemplate the divine realm, and math is the surest way to accomplish this. Numbers are not simply symbolic, but are actual things. Three is real and we can contemplate it.



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In the classical world, math studies would have begun with calculation, or “practical logistics”. This would be counting, addition, subtraction, multiplication, division, etc. Today, we would call this arithmetic, but for the ancients this was not the case.

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Mathematics classically was dominated by the Quadrivium: Arithmetic, Geometry, Astronomy, and Harmony. Each of these liberal arts were focused on contemplation, and were very much intertwined with metaphysics and theology.



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What is the Quadrivium?

Arithmetic was the study of pure number. What is threeness? What is the nature of even and odd? The one and the many? In a word, arithmetic was concerned with Unity. This was the pure Divine because the god was pure unity, pure simplicity.

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Geometry was the study of pure form. It governed both plane geometry and stereometry, solids. Herodotus believed that the Egyptians invented geometry in their advanced ability of surveying and apportioning land. If this is true, the Greeks perfected it.



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Astronomy was the study of the heavens, which was really stereometry applied to motion, that is, solid geometrical figures in motion. These motions, when properly studied, produced music, thus, the music of the spheres.

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Harmony was the study of music, but more properly, it was the study of pure ratio and proportion. Whole numbers, when considered together, produce pleasing tones. The ancients were obsessed with creating tools and instruments that could create these ratios in perfect harmony.



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Each of these contains in itself the art of calculation and the contemplation of pure number. Number illuminates our understanding of the cosmos and the divine.

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It was for the common folk to only consider the “practical” application of math. It was the mark of the true philosopher to consider the metaphysical.

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There is no time to consider the various understandings of the purpose of math throughout time, because there is a lot to consider. My overview has focused primarily on the Pythagorean understanding, which dominated the classical world. There is so much more to study.



PYTHAGORAS.

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It is worth pondering how differently we study math today. We do not consider numbers to be “real”. We do not treat plane figures as actual ideas, but merely as illustrations. We have no use for music outside of entertainment, and we have dropped astronomy as a study long ago.

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Can we return to a classical idea of mathematics? If so, how?

First, we have to recognize how powerfully algebra has overtaken modern study. All subjects are constrained to an algebraic approach. This has lead us to forcing students to think “abstractly” as quickly as possible.

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We discourage counting on fingers or using manipulatives, and we leave students in the dust as we power through year after year, trying to get to as advanced a math as quickly as possible. We need to slow down and evaluate what we're doing.

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We need to realize that math is not the practical part of education, while the humanities are the “artful” studies. For the ancients, the opposite was true!

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Math should be “useless”. All of the liberal arts should be. We need to study for truth’s sake, because the most useful thing we can do is contemplate the Divine.



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