

Chapter 3 How to Give Your Child a Great Education in Algebra, Geometry, and Trigonometry and Beyond

This Chapter is for a parent who has a student who likes Math and wants to give this student the best possible Math Education, one that is vastly superior to what the Public Schools deliver.

This is explained in our eBook with the same title. You may obtain a free PDF copy of this book at www.HomeschoolerToday.com by clicking on the Free Resources Tab, and then the Educational Tab and then the eBook choice and downloading the eBook.

Why would you want to give your child a great math education, and why would your child want it?

Here in one reasons we give on the eBook Webpage.

Math for success!!!

Whether your student is entering the workforce, military, is college-bound or a future STEM student, you'll need a modern math curriculum that will fully prepare your student for their future life.

It's is huge responsibility, but fortunately very easy to achieve today thanks to modern technologies and resources, even if you don't know much math or even like math.

Here are some Questions and my Answers any parent and child needs to know to achieve Math Success in an efficient and affordable way.

Why is Math so important?

In a nutshell, Math will open up many doors of opportunity for your child that will otherwise remain closed. Math is like a special universal language that is necessary for understanding many things in life.

Mathematics, or Math, is an indispensable tool used in almost all modern technologies. You may have heard of the STEM subjects. STEM stands for Science, Technology, Engineering and Mathematics. It is widely known that a STEM career can be very lucrative and satisfying.

Mathematics at some level underlies all STEM subjects. So if your child has any aspirations for a STEM career, then your child needs a good math education.

Many STEM careers require advanced education in science or engineering schools, which require math competency for success.

But also, There are hundreds of thousands of jobs going unfilled today in our modern manufacturing economy because there are not enough qualified trained people available. The Boston Consulting Group estimates that may be around 600,000 in 2012. And, the U.S. manufacturing economy is actually expanding so there will be more and more new jobs created.

Health care is similar. But also, you should know that there are many non-professional technical careers or jobs that do not require college that also are very well paid. For example, jobs in high tech maintenance require training and knowledge in things like hydraulics, electronics, electrical and mechanical power systems, and much more.

You might want to visit www.HaneTraining.com to see a listing of the types of subjects and programs industry is training its employees in. And, all of these programs require practical mathematics for optimal success. If a worker knows practical mathematics s/he is much better off than one who does not.

It is much better to introduce a child to basic practical mathematics first, before going on to more advanced topics for reasons you should soon fully understand.

What may surprise you even more is you will learn how virtually all children can learn all the math they need for any STEM subject, all the way through calculus and differential equations, in high school IF, and this is a very big IF, they are taught math properly and in a tiered manner.

But, even more amazing, is how quickly and easily a child can learn all of the practical math they will need for a non-professional career.

Unfortunately, this is not how math is taught in our modern standard middle and high school mathematics curriculum.

Fortunately, there is something you can do about it. In fact, a home school teacher can do things for their student today that is not possible in a regular school. That is why it is “vastly Superior” to Public School Math.

Just what is Math?

Math consists of numbers and geometry, and the tools needed to solve problems. Numbers start with the counting numbers, 1, 2, 3,... and expand to include negative numbers, fractions or rational numbers, and then decimal representations.

At that point you could just mention irrational numbers which are non-repeating decimals. This constitutes what is called the Real Number System and corresponds to the points on a straight line ruler.

Complex Numbers corresponding to points on a plane come later. These are critical for STEM and we cover them in Tier 4 in a way that is rarely done at the high school level, and is actually easy to understand.

Arithmetic consists of learning to perform various operations with these numbers like addition, multiplication, etc.

Geometry consists of various physical figures you can create like lines, angles, triangles, polygons of various types, circles, cones, boxes, balls, etc.

Algebra is a tool used to solve arithmetic and geometry problems. It combines numbers and geometry in a very powerful way resulting in what is called analytic geometry.

Trigonometry is an extension of geometry to better understand triangles. This is what we cover in the Practical Math Foundation, Tier 2.

Then trigonometry has been extended in many wonderful ways to solve many more problems. We cover this in Tier 4 to get the student ready for Calculus and STEM subjects.

Calculus, which we cover in Tier 5, is a powerful tool that extends the power of algebra and geometry to solve many more problems involving rates of change and continuous sums.

If you want a “crash course” in calculus and you already know pre-calculus math you may simply watch the three Calculus videos in the Free Resources. at www.HomeSchoolerToday.com

Differential Equations are an extension of Calculus and are the workhorses of modern science and engineering. We cover this in Tier 6.

Calculus and Differential Equations are very easy to learn Conceptually. And, now today with the 21st Century Tool, Wolfram Alpha, it is very easy to do all of the problems, which were extremely difficult with the manual 18th Century tools still being taught today in the Standard Math Curriculum. This is the main reason this new Program is “Vastly Superior” to Public School Math.

Math can be understood at many levels. It is kind of like some video games. There are many levels each building on the previous one. One can go as far as one has the time and energy and motivation to do so and there is NO END ever.

Math is a huge field. There is as much math as there is music or literature. It is continuously expanding. As we progress as a civilization our math expands too. New mathematics is being created all the time.

Math also consists of “tools” developed and used to solve problems. In the old days we used many “tables” to solve problems. For example, we used logarithm tables just to carry out arithmetic calculations. Then these tables were put into a device called a slide-rule which was the tool all engineers and scientists used for centuries, until 1972. Trigonometry tables were also used a lot, and they too were sometimes included in a circular sliderule.

Then, in 1972, came the first scientific calculator, the HP-35, and all these tables and tools became obsolete. Later came the spreadsheet which was an even more powerful tool. But the best was yet to come!

In 2009 an extremely powerful tool called Wolfram Alpha was release to the world. WA has had a greater impact on STEM Math than the scientific calculator did.

We introduce Wolfram Alpha in Tier 4, which does for calculus, differential equations, and linear algebra what the calculator does for arithmetic and trigonometry. And, so on.

However, what You Need to Know is this: Today a student should first learn to use a power tool called the scientific calculator (the TI30XA is the one I use), and all of the Algebra, Geometry, and Trigonometry needed to solve most practical everyday problems in about fifty hours of their time and less than \$200, and, very easily and enjoyably too. Tiers 1 and 2.

In fact, the TI30XA can seem like “magic”. It is kind of like having a staff of many very fast brilliant calculating mathematicians at your disposal 24/7. It is hard for a person today to appreciate just how much drudgery has been eliminated – literally 99% of the very tedious and difficult calculation techniques that were taught and used pre-1972 are gone – disappeared – vanished. It really seemed like magic in the 1970’s.

Learning to use the TI30XA is a great way to “motivate” students who have previously had difficulties with math. And, it is a great Foundation for any student, even those who will go on into a STEM subject.

And, now since 2009 we have a Tool which does for all advanced STEM Math what the Scientific Calculator did for arithmetic. And, so far as I know, it has not been incorporated into any high school textbooks yet. That is why I say you can teach your student math that is “vastly superior” to public school math.

What should you do if you don’t know math very well yourself?

Punt? Pray? Give up? Soldier on as best you can?

What would you do if you had a mechanical problem with your car you didn’t understand or have the tools or knowledge to fix? My guess is you would take it to a mechanic you trust. That’s what I do.

First, you should realize you will not be able to teach math effectively and optimally to your child if you don't really understand math any more than you could fix your car on your own unless you are a trained mechanic. You will need to find a math teacher you trust who can do the job for you.

You may use the later chapters in this book to help you evaluate a potential teacher or tutor. But beware, a bad teacher can "ruin math" for your child and induce a dislike of math or even a phobia. Of course, tutors are expensive too.

Enrolling your student into a classroom situation might work, but it won't for most children for reasons discussed in other Chapters. Any child needs selfpacing, interactivity and continual positive feedback to succeed in any real or optimal way. And, this is virtually impossible in a typical classroom class no matter how good the teacher is.

If you want to Homeschool your child in Math, here is what I recommend. Go to www.HomeschoolerToday.com and enroll in the Family Plan.

Then, you can be sure you are using the Content I recommend and SPIKE Pedagogy.

You will be the Coach, and I will be the Teacher via the video lessons and the exercises and quizzes all tracked in the Learning Management System so you, as Coach, can track your child's progress and do the Coaching.

In later Chapters I will discuss in more detail just what to do with three categories of students;

Students who do not want to attend college.

Students who want to go to college, but not study STEM subjects.

STEM students, who are college bound.

However, ALL three categories should start with Tiers 1 and 2 as a foundation for their math education.

SO, I recommend you just get started, and go for it!

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