

A
Home School
Parent's
Guide

How to Give
YOUR CHILD
a Great
MATH EDUCATION

in Algebra, Geometry & Trigonometry

By Craig Hane, Ph.D.

A Home School Parent's Guide on...
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a Great
Math Education
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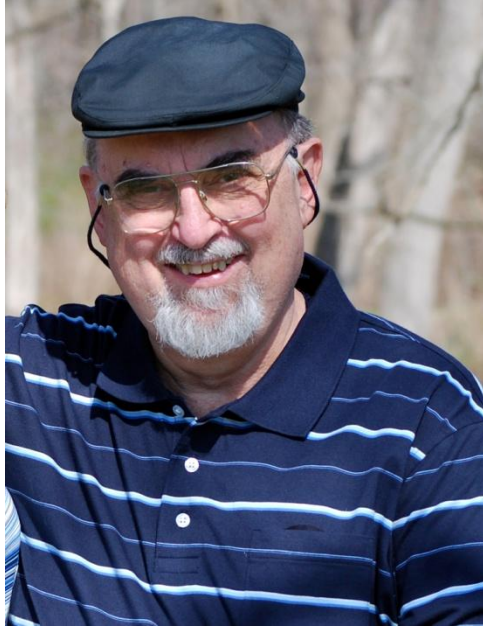
Craig Hane, Ph.D.

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Questions or Comments for the Author?

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For much more free information and many valuable resources,

Visit: www.CraigHane.com

Mathematics, post-elementary, is a challenge for many home school parents/teachers. It is very difficult to teach mathematics unless you are a highly trained and experienced math teacher. However, “the times – they are a changing.”

In this book you will learn several things, such as how . . .

- You can deliver your child/student a superlative mathematics education thanks to modern technologies and modern resources.
- You can do this very affordably both in terms of time and money. You’ll probably be amazed at what you can achieve today.
- And most important, it is possible even if you do not know or like math yourself or have the adequate time to dedicate to it.

Many home school parents have been asking Craig Hane Ph.D. (aka Dr. Del) several questions for some time now, and he is now answering these questions in this book. For additional information, go to www.CraigHane.com

Dr. Del has been teaching math at all levels from industrial math to advanced graduate school theoretical math for decades. Many of his students claim he is the best teacher they have ever had. Now, you and your child can benefit from this too.

When you finish studying and digesting this Guide, and the many free supplemental materials you will be given, you will know exactly what you should do and how to do it.

“It” is to deliver your child a superlative math education that will be appropriate for your child no matter what career he or she wishes to pursue.

How you choose to do this will depend on you and your abilities, interests and resources. If you are going to teach the math yourself Dr. Del will give you many resources for free that should help you do an even better job.

If you need more help, then Dr. Del has created an incredible program that you and your child will find very valuable. It is called the Practical Math Foundation.

It will kind of be like having a great math tutor on call for less than a dollar per hour. Actually in many ways it is better than a live tutor as you will learn in this Guide.

**How to Give
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Chapter 1. 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 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.

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. I will tell you more about this in later chapters.

You are also going to learn in later chapters that math ideally should be learned in a tiered fashion. 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.

Chapter 2. 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.

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. For example, the Fourier Transform is an amazing tool that underlies many modern technologies and it is essentially based on a sophisticated extension of trigonometry and calculus.

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 visit: homeschoolmathematics.com/svcm/ and watch three videos.

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

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 three centuries, until 1972. Trigonometry tables were also used a lot, and they too were sometimes included in a circular slide-rule.

Then, in 1972, came the scientific calculator and all these tables and tools became obsolete. Later came the spreadsheet which was an even more powerful tool which we introduce in Tier 3. Then came an extremely powerful tool called Mathematica, which we introduce in Tier 4, and 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.

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.

