

Transcription by Evernote

Good evening. I enjoy the stimulation of advanced mathematics. I like using the left side of my brain [Google AI:

[https://www.google.com/search?q=the+left+side+of+the+brain+is+used+for&client=firefox-b-1-d&sca_esv=5ed3572dacaed608&ei=GGxAaPOZFa7pwN4Pyvuz2QY&ved=0ahUKewjzhZqLkNiNAxWuNNAFHcr9LGsQ4dUDCBA&uact=5&oq=the+left+side+of+the+brain+is+used+for&gs_lp=Egxnd3Mtd2l6LXNlcnAiJnRoZSBsZWZ0IHNpZGUGb2YgdGhlIGJyYWluIGlzIHVzZWQgZm9yMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHSLUFUABYAHABeACQAQCYATagATaqAQExuAEDyAEAmAIBoAIKmAAMaiAYBkAYGkgcBMaAHHowSyBwC4BwDCBwMyLTHIBwU&scient=gws-wiz-serp\]](https://www.google.com/search?q=the+left+side+of+the+brain+is+used+for&client=firefox-b-1-d&sca_esv=5ed3572dacaed608&ei=GGxAaPOZFa7pwN4Pyvuz2QY&ved=0ahUKewjzhZqLkNiNAxWuNNAFHcr9LGsQ4dUDCBA&uact=5&oq=the+left+side+of+the+brain+is+used+for&gs_lp=Egxnd3Mtd2l6LXNlcnAiJnRoZSBsZWZ0IHNpZGUGb2YgdGhlIGJyYWluIGlzIHVzZWQgZm9yMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHMgoQABiwAxjWBBhHSLUFUABYAHABeACQAQCYATagATaqAQExuAEDyAEAmAIBoAIKmAAMaiAYBkAYGkgcBMaAHHowSyBwC4BwDCBwMyLTHIBwU&scient=gws-wiz-serp]).

Unfortunately, I never got as far along in school in mathematics-wise as I could have. A big reason for this was moving around. In fact, in 1993, I attended four different schools.

The first one was in West Des Moines, Iowa. The school district there was considered quality [people told me this]. Eighth grade year, I was taking pre-algebra. The class would have prepared me to take something like pre-calculus and or trigonometry senior year. About halfway through the year, I got to move to Garrison, South Dakota. As I was leaving, I had to have my teachers fill out this form. The form was used to give my new teachers a basis for grading. Thus, my old teachers had to write the grade I was getting in their classes. My math teacher, Mr. Cooley, made what would seem to be a minor mistake, but it became a huge deal. He put, by mistake, his initials in the box reserved for grade. His initials were RC for Ryan Cooley.

Unfortunately, the people at the school in Garrison, which was a really lousy school, thought I was getting a C in math. No matter how much convincing I did, they would not be persuaded. I even resorted to calling the principal at home. Still no grade change. I didn't have to take a C in pre-algebra. I had to take a C in basic math, which was what 8th graders took in Garrison, South Dakota. Garrison is really small, less than 1,000 people. Not all that many people from Garrison are going off to college [people there say]. It is a rural area. Thus, the high school and junior high wasn't set up for college-bound individuals.

For about a quarter, I attended Lincoln High School in Sioux Falls, South Dakota. I took an algebra or perhaps a pre-algebra class there. It was pretty dull for me, whatever it was.

Soon after that, I moved again to Rockford, Illinois. Since I was on the college-bound track, I wanted to take advanced classes. My dad and I got to meet with my counselor. I was enrolled in Honors English and Honors History. In some subject matters, if you have not had the background, you can jump right in [educational experts say]. History and English are good examples [educational experts say]. In other subject areas such as math and science, if you haven't had the background [educational experts say], it is quite a bit harder to jump in [educational experts say]. Math and science build on themselves [educational experts say]. It was a hard decision for math.

We were deciding between Honors Algebra and Regular Algebra. I was concerned if I went into Honors algebra, I'd be too far behind. I expressed that concern to the counselor. I asked, "If I was too far behind, could I get out?" She was very firm in suggesting I could not. Later I would find out people did move from Honors to regular classes and regular classes to Honors classes. It did happen. Toward the end of my high school experience, my counselor told my dad that "she regretted not having me enrolled in all Honors classes my first year." After the first year, it was Honors classes for everything where Honors classes could be taken. At my school, Honors classes had weighted grades. My school has since discontinued this practice due to a lawsuit, I read in the *Rockford Register Star*, but when I was there, it was the rule. Weighted grades involved more points for getting the same grade in Honors classes than getting the same grade in regular classes. For example:

- In an Honors class, an A counted for five points, while in a regular class, it counted as four points.

The difference between regular algebra and Honors algebra was largely pace [the school said]. The two classes covered the same material [the school said]. The difference was Honors algebra took one year to cover it, while regular algebra took two years [the school said]. I took regular algebra my freshman year. I did well in that class. The pace was slow. Because I did well, the next year I went up to Honors Algebra, thus I wasted the first year, since everything I did in the first year would be covered in the first semester of regular algebra.

The year after that, I took Accelerated Geometry and Computer Programming. My senior year, I took College Algebra. I also took advanced science classes. At our school, Honors science classes differed from regular science classes in how much math was emphasized [the school said]. I liked that part of Honors classes because I liked the math. I actually really preferred doing chemistry and physics problems rather than doing labs where you mix up chemicals. I wasn't intending to major in anything science or math related. Even in high school I wasn't thinking about that. Toward the end of high school I thought I wanted to be a teacher. I was very foolish back then, but what can you do? I later learned how rotten the teaching profession is.

When I started college, right away it was pretty clear I wasn't going to major in anything math or science related. Even before I decided on what specific major or majors to major in, I chose the Bachelor of Arts path. That involves a lot less science and math than does the Bachelor of Science path [the school said]. I did have to take one math class. I took college algebra. That was less rigorous than the college algebra I took in high school. Part of it was the nature of the course itself and also part of it was the professor. She was pretty easy going. Also, she was very passionate about her Hindu beliefs. She would at times devote class time to talking about how much she loves Hinduism. If she was a Christian fundamentalist, that would be a problem if she wanted to rave about her beliefs. But I don't have a problem with Hinduism.

I did take statistics for sociology both in college and graduate school. Other than that, I didn't have much that was even remotely related to math. I majored in philosophy and a part of philosophy, logic, relates to what one does in geometry and computer programming [philosophy experts say]. But overall, philosophy is quite a bit different from math. Mostly philosophy and sociology, along with my leisure endeavors, stimulated one side of my brain, the right side [Google AI: https://www.google.com/search?q=the+right+side+of+the+brain+is+used+for&client=firefox-b-1-d&sca_esv=5ed3572dacaed608&ei=QWxAaK7-I5fOp84P7_Xz0QM&ved=0ahUKEwjuou-ekNiNAXUX58kDHe_6PDoQ4dUDCBA&uact=5&oq=the+right+side+of+the+brain+is+used+for&gs_lp=Egxnd3Mtd2l6LXNlcnAiJ3RoZSByaWdodCBzaWRlIG9mIHRoZSBicmFpbiBpcyB1c2VkIGZvcjIGEAAYChgeMgYQABgIGB4yBhAAGAgYHjIGEAAYCBgeMgYQABgIGB4yBRAAGO8FMgUQABjvBTIIEAAYgAQYogQyBRAAGO8FMgUQABjvBUjWE1DXA1jcEHABeAGQAQCYAV-gAZIEqgEBN7gBA8gBAPgBAZgCCKAC0QTCAGoQABiwAxjWBBhHwgIIEAAYBxgKGB7CAggQABgHGAgYHpgDAIgGAZAGBpIHATigB_krsgcBN7gHyQTCBwLjEuNS4yyAcu&scient=gws-wiz-serp]. That's the conceptual, artistic

side, while the left side is the logical, reasoning side of your brain. I had an itch to stimulate that side of my brain, the left side [Google AI:

https://www.google.com/search?q=the+right+side+of+the+brain+is+used+for&client=firefox-b-1-d&sc_esv=5ed3572dacaed608&ei=QWxAaK7-I5fOp84P7_Xz0QM&ved=0ahUKEwjuou-ekNiNAXUX58kDHe_6PDoQ4dUDCBA&uact=5&oq=the+right+side+of+the+brain+is+used+for&gs_lp=Egxnd3Mtd2l6LXNlcnAiJ3RoZSBYaWdodCBzaWRIIG9mIHRoZSBicmFpbiBpcyB1c2VkIGZvcjIGEAAYChgeMgYQABgIGB4yBhAAGAgYHjIGEAAYCBgeMgYQABgIGB4yBRAAGO8FMgUQABjvBTIIEAAYgAQYogQyBRAAGO8FMgUQABjvBUjWE1DXA1jcEHABeAGQAQCYAV-gAZIEqgEBN7gBA8gBAPgBAZgCCKAC0QTCAGoQABiwAxjWBBhHwgIIEAAYBxgKGB7CAggQABgHGAgYHpgDAIlgGAZAGBpIHATigB_krsgcBN7gHyQTCBwcwLjEuNS4yyAcu&sclient=gws-wiz-serp

I thought it would be neat to study trigonometry. I never got to study that in high school [I did indeed study trigonometry at high school; I may have meant something different]. At my high school, the group ahead of me got to take pre-calculus. algebra senior year. The group that was the highest got all the way up to calculus senior year.

I even mentioned my desire to study trigonometry in a Federation without Television lecture. It was a lecture about rest and relaxation. I mentioned how it would actually be relaxing since I so often use the other side of my brain [Google AI: see above]. It would be a change of pace. A change of pace can be very relaxing.

Graduate school was too busy to even think about doing something like studying trigonometry. After graduate school, I freed up some mental space. I had this urge to study Latin, which I eventually did. I really enjoyed doing that. After a while, I again got this stronger urge to study trigonometry. I knew Latin was a big time commitment, so I felt reluctant to add something else on to my daily schedule. I did eventually check out a trigonometry book. It sat on my table untouched for quite a while until I eventually picked it up and began to study advanced mathematics. It was a great move.

At first, it was strictly trigonometry that I wanted to study. Then later, some of the books did not have a clear division line between what was trigonometry and what was pre-calculus. So eventually, my advanced mathematics study included not just trigonometry specifically, but also pre-calculus. It got to the point where studying either concept was fine.

How do we define pre-calculus? How do we define trigonometry? Trigonometry, I think, is the easier of the two to define. Trigonometry “can be defined as the branch of mathematics pertaining to the relationships of size and angles of triangles. Trigonometry is all about triangles.”

[<https://en.wiktionary.org/wiki/trigonometry> for a definition similar to this]

Pre-calculus sometimes is defined in a way that it includes trigonometry. Some textbooks are called pre-calculus and have part of the textbook devoted to trigonometry. Other textbooks don't have any trigonometry, just other pre-calculus concepts. There are also textbooks just for trigonometry. Pre-calculus, like the name suggests, prepares one for calculus.

Now, mathematicians suggest “trigonometry is the first math course or field of study in which you move from manipulating numbers and variables to studying mathematical relationships, which is what calculus involves. Pre-calculus, although a prerequisite for calculus does involve understanding some relationships, but it also is about computing and manipulating numbers and variables. I think we can define pre-calculus as advanced mathematics concepts not in trigonometry, but which are needed for calculus.”

There are a lot of neat concepts in pre-calculus.

Permutations and combinations are a concept I studied in pre-calculus on my own and in college algebra when I took it years ago. In fact, there are a number of concepts I have encountered in pre-calculus that I covered back in my study of algebra. It has been a while since I studied algebra. Eight years since that college course or something like that. Ten years plus since I first took that college algebra class. In high school, a lot of my study of pre-calculus is refreshing my mind about these concepts also mentioned in algebra. Trigonometry, on the other hand, has been pretty much entirely new. In algebra, we scratched the surface of some very basic trigonometry concepts, but overall trigonometry has been just about entirely new.

“Permutations and combinations are used when you have a pool of possibilities and you need to pick out certain items, people, places, whatever, to put them in a certain configuration. Sometimes order matters, sometimes it is not. For one of these, you use it if the order matters, for the other you use it if it does not. You can find out how many different possibilities exist. I have seen word problems involving combinations of marbles, collections, committee members, items for a meal. One problem even mentioned a combination lock, though it asked “why

would a combination lock more technically be called a permutation lock?””

[Google AI: “Permutations and combinations”]

The answer is because in a combination lock, the order matters. If you have a combination which is 7, 14, 34, you have to have it in that order. If you put in 34, 14, and then 7, it's not going to work. [Google AI: “Permutations and combinations”]

Functions are very important in mathematics {like mathematicians say}. I remember covering these in algebra. From what I gather about calculus, these are used a fair amount in calculus, if not a whole lot. Functions are in the form of f of x equals x something. It can be x squared, square root of x , x cubed, $2x$ plus 4 , x minus 8 . A lot of different possibilities

Depending on what is done to x , how the graph looks can vary. One concept I encountered in precalculus was entirely new.

is the principle of mathematic induction. I really don't see the point of it, but it's good to learn nevertheless. It seems like a concept you could just as well skip over and not be negatively affected in your further mathematic studies. Other concepts you definitely don't want to skip over.

Mathematical induction is:”

1. SN
2. $As 1$
3. $As K$
4. $As K$ plus 1 .

You assume SN , then you plug in SK plus 1 . From what I have gathered through trying to figure out mathematical induction problems is mathematical induction is used when you're trying to explain why certain principles work. Inductive logic is logic in which you have a particular example and then you try to use that to draw conclusions for the whole. Deductive logic, which is used in geometry and computer programming, involves having a general principle, theory or whatever, and then seeing how it applies to specific cases.” {A similar definition to what I cited during this speech:

<https://www.mathcentre.ac.uk/resources/uploaded/mathcentre-proof.pdf>]

Matrices I've encountered in both algebra and precalculus. “A matrix is numbers in rows and columns inside of brackets. Matrices can be big or small. You can have a matrix with a 2 by 1 configuration. You can also have a matrix as big as 4 rows by 4 columns. Even bigger yet, usually the problems don't include 25 by 25 matrices. The simple problems usually aren't too bad. For example, you may have a matrix:

- 4 0 1 1

and then you're asked to add 1 to that matrix. That would give you $\begin{bmatrix} 5 & 1 \\ 2 & 2 \end{bmatrix}$. You can perform other operations besides addition. You could even add two matrices to each other. You can multiply or divide matrices by each other. Multiplying or dividing matrices can be complicated when the two matrices in question do not have the same configuration. For example, one may be 2 by 1, one may be 3 by 2. There's a process you go through in order to make a new matrix. You can also find the inverse of a matrix." [I forget the original source(s). This offers a similar explanation: <https://www.mathsisfun.com/algebra/matrix-introduction.html>]

Arithmetic and geometric sequences are studied in college algebra. I remember studying in college algebra. Arithmetic sequences are not too hard to understand. "They involve adding a certain number to a sequence of numbers. It may be 5, it may be 10, it may be 12. An plus d is the basic form of an arithmetic sequence." [I forget the original source(s). This offers a similar explanation:

<https://www.mathsisfun.com/algebra/sequences-sums-arithmetic.html>]

"A geometric sequence is harder to understand intuitively. It involves a ratio. The ratio is an plus 1 over a_n ." [I forget the original source(s). This offers a similar explanation: <https://www.mathsisfun.com/algebra/sequences-sums-geometric.html>]

Logarithms are one of the most powerful concepts in mathematics. "You have two types of logarithms, natural and regular." [I forget the original source(s). This offers a similar explanation: <https://www.mathsisfun.com/algebra/logarithms.html>] These I encountered in algebra. I also used them in chemistry. "Logarithms involve increasing numbers dramatically, more than just regular exponents. For example, the difference between x squared and x cubed is one more x in x cubed that you're multiplying by.

With regular logarithms, when you increase the power to raise them to, you increase by power of 10. For example:

1. $\log 0$ is 1,
2. $\log 1$ is 10,
3. $\log 2$ is 100,
4. $\log 3$ is 1000,

so on and so forth.

Natural logarithms involve this specific number e . Mathematicians consider e like the number π , a very special and very specific number, which has a host of functions.” [I forget the original source(s). This offers a similar explanation: <https://www.mathsisfun.com/algebra/logarithms.html>]

I have seen it used for computing interest, both simple and compound. I have also seen it used for general growth and decay problems. I have seen it used for computing the half-life of something.

I have an interesting story about regular logarithms. My high school chemistry teacher, Mr. Brown, had this rule. For tests, he wanted you to take the responsibility to bring the calculator for yourself. He didn't want to have to provide it for you. If you forgot your calculator on test day, he would offer you a deal. He said, “You could take his calculator to use, but you had to forfeit a point on the test.]

During the tests on logarithms, one of the slackers in the class didn't have a calculator. This kid didn't put much effort into chemistry class. Mr. Brown [told him] “he would lose a point if he borrowed Mr. Brown's calculator.” [He said] He was so lost and so out of it that decided to forego the calculator and get the extra point.” Mr. Brown quipped, “you have those log tables memorized?” He said “he did.” It's absurd to think anyone would memorize [log tables]. Yeah, he did. It's absurd to think anyone would memorize log tables, much less a slacker.

When we were talking about logarithms in college algebra, I made a humorous comment that that kid had log tables memorized. He wasn't in the class, but the teacher had had him before. She made some comment about “how that was unbelievable considering how poorly he did in her class.” One dude I knew from my cross-country team made some comments about “how I was ripping on this kid by saying that I don't think the people in that class got my humor there.”

One of the most fascinating uses of logarithms is a spiritual one. David Hawkins has created this map of consciousness, which he claims describes the scale of spiritual steps [<https://veritaspub.com/product/the-map-of-consciousness-explained/>]. It's based on logarithms. I'm not claiming there's any validity to this. I'm skeptical of it. I do think it's very fascinating. He says the different spiritual states calibrate at different logarithms. He claims the more noble the spiritual state, the more logarithms it calibrates at. For example, at the low end of the scale is “shame”. He says, “shame calibrates at 20 logarithms, while guilt at 30 logarithms,

apathy at 50, pride at 75 or 100, desire at 125, anger at 150. Actually, fear was at 75 to 100. Pride is 175. Courage is 200.”

Hawkins claims that at certain points in his map of consciousness, “you make a quantum leap when you get to that state. He claims 200 is a huge leap, which is the level of courage. He says when you jump from pride to courage, you are moving from falsehood to truth. He claims everything 200 and above is a level of truth, and everything below 200 is a level of falsehood. After truth comes states such as acceptance, neutrality. At 400 logarithms you have reason. Hawkins claims when you jump from reason to love, which is 500, you make another what he calls a quantum leap. 540 is unconditional love. 600 is peace. Hawkins claims when you move to 600, you again make a quantum leap. He claims from 700 logarithms to 1000 logarithms are the states of enlightenment. He says the higher up you get, the fewer number of people who are in those states. He claims throughout history maybe only 3 people have been at 1000.”

It's a really fascinating idea. I really doubt if it's valid. It could be a great metaphor for spiritual progress if nothing else. In order to determine where somebody or something is at, you use what he calls kinesiology. His use of the term is different than the standard use. Usually when you use the term kinesiology, you are referring to the scientific study of kinesiology. My cross-country coach in college taught kinesiology. It's the scientific study of muscles.

From what I have gathered, Hawkins claims “that muscles respond to how spiritually valuable something is. He claims if something is good for you, your muscles will respond by flexing, while if something is bad for you, your muscles will, as he says, go weak.”

The first time I ever heard of this kinesiology idea was from Wayne Dyer [on one of his recorded public speeches]. Wayne Dyer didn't use the term kinesiology; he called it “a strength test.” He said “what you do is you hold some object against your chest and then you hold your other arm out. He claims if the object you hold against your chest is good, people will not be able to move your arm, while if the object you hold against your chest is bad, people will be able to move your arm.” The examples he used were:”

1. For good, a banana.
2. For bad, a rap CD.”

I used to work with kindergarten students, so I think it's absurd to say if kindergarten students hold a banana against their chest, I will not be able to move

their arms. I'm not that weak. I think I can move the arm of a kindergarten student no matter what he or she is holding against his or her chest. Unless, perhaps, it's kryptonite. Then I would crumble.

Hawkins claims “you can ask this force field or whatever it is at what level does something calibrate. He says you can ask, for example, does such and such calibrate over 10 logarithms? If it does, whoever's muscles you're feeling will supposedly flex, while if it doesn't, the muscles will, as he says, go weak.”

Conic sections is a concept that relates to algebra, pre-calculus, and also geometry [I have encountered them there]. “Conic sections are the shapes: circles, ellipses, parabolas, hyperbolas. We all understand what circles are; we see circles all the time. A perfect circle involves every point on the edge being the same distance to the center. If a point is to the far left or to the far right, they're all the same distance from the center. That is what makes a circle a circle.

An ellipse is like a circle, but it differs because not all the points are the same distance from the center. Some ellipses look very much like perfect circles. Other ellipses are elongated and

The degree in which look more like those balloons you use for making balloon animals or hot dog buns.

an ellipse deviates from a perfect circle is eccentricity. A parabola looks like a semicircle or semi-ellipse. One end is open, one end is closed. It can go up or down, left or right. And a parabola is like two parabolas. The closed ends face each other.

Hyperbolas can go up, down, or left, right. Each of these conic sections have different equations for them. Based on the equations, you can tell which conic section you're dealing with.” [I forget the original source(s). This offers a similar explanation: <https://www.mathsisfun.com/geometry/conic-sections.html>]

Fortunately, I have felt I have sufficiently mastered the concepts of pre-calculus and trigonometry. Thus, I have felt ready to move on to calculus. I have started to study calculus.