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 $a^m \times a^n = a^{m+n}$ $a^{-n} = \frac{1}{a^n}$ $A = \frac{1}{2}bh$ $C = 2\pi r$ $A = 2\pi r^2$
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 $\frac{a^m}{a^n} = a^{m-n}$ $a^2 - b^2 = (a+b)(a-b)$

What is Math good for?

a^{m-n}

Mathematics

What it is now

Memorization, Recitation, manual calculations

30 days hath September, April, June, and November;
All the rest have 31, Excepting February alone,
And that has 28 days clear And 29 in each leap year.

What it should be

Smart Phones and Apps

<https://www.timeanddate.com/calendar/>

[By Julius Nadas](#)

kontrowersyjna.

Warning.
Controversial
content.

警告。論争の的となる
コンテンツ。

Math Courses are not addressing the skills our students need.

My internationally acclaimed brother-in-law (<https://aristos.org/aris-06/lack.htm>) established a school for portrait artists in 1971 in Minneapolis. Although they worked with many of the same tools that a house painter would use and although he did say that “virtually all great painters were trained under this method”, I don’t think he was targeting house painters and I would not send someone who wants to be a house painter to The Atelier. Even though they probably would benefit from what he taught, I don’t think it would be the most effective way to train a great house painter.

Similarly, our math curriculum is focusing on some beautiful principles, but I don’t think it is preparing our students to learn the math they will need in other disciplines or on the job.

KNOW MATH

What does a Math teacher think you need to know if you want to know math?

You start by learning how to count. You count your fingers, your toes, the number of peas on your spoon. Things like that.

Then you learn how to add numbers. Like five fingers on this hand plus five fingers on the other hand gives you ten fingers.

Then you learn how to multiply. If you and your 3 friends each have ten fingers then there are a total of $4 \times 10 = 40$ fingers.

All of this is important, but most people pretty much know this before they enter the first grade.

What do you do for the next 12 years, before you start college?

TEACHING MATH

hasn't changed in hundreds of years.

The rest of the world uses computers and artificial intelligence to become more efficient. Math does not.

Say you want to multiply 315×826 to get 260190

Instead of using technology, Math teaches a manual algorithm:

First you multiply a bunch of stuff:

$$5 \times 6 + 310 \times 6 + 5 \times 20 + 310 \times 20 + 5 \times 800 + 310 \times 800 =$$

Then you add up the products:

$$30 + 1860 + 100 + 6200 + 4000 + 248000 = 260190$$

What's the point of that?

What Do Math students need?

Students need to look at a problem, to figure out what it is asking for, to determine the relationship between that and the given information, and to come up with a way to get the answer.

In the past this meant finding a formula and doing a calculation with it. I believe that formulas and calculations are no longer needed by most of our students. They should be removed from our courses and referenced only as historical footnotes. Basic Math which teaches manual algorithms for adding, subtracting, multiplying and dividing numbers is unnecessary and should also be eliminated.

NO MATH

Math courses stress formulas and calculations because they are easy to teach and test.

But no one really needs either of them since calculators and apps are a much better way of getting answers. Memorizing a series of steps to solve a problem by hand is not critical thinking.

Other disciplines like business, manufacturing tech, physical science, and health science have all recognized this and have implemented technology in their courses. Math needs to follow suit and give students modern tools that they need to master instead of the math they are learning now.

Students need to learn to use technology. Every student should have a smart phone, a lap top computer, a tablet, a net book or a pad in class.

They should be familiar with web sites like

- [Photomath](#),
- [Wolfram Alpha](#) and
- [Desmos](#)

They can also use other web sites like the one I wrote called [Wrightcalc.com](#).

- Start by looking at something so simple you really don't need any tools:

calculating the area of a rectangle

- The formula is $AREA = LENGTH \text{ times } WIDTH$.
- If you know any two of the three values, you can calculate the third value.
- The variables we use are: $A = AREA$, $L = LENGTH$, and $W = WIDTH$
- The 3 formulas are: $A = L * W$, $L = A / W$, and $W = A / L$
- To use the app all you have to do is to supply two of the three values and click on the third button: <http://faculty.ccc.edu/jnadas/js/arearect.htm>
- Once you understand this app then we go on to something that is more complicated and more useful.

Compound Interest Calculations



[My Financial Calculator](#)

- Suppose you deposit \$500 into a savings account that pays 2.5% per year credited on a monthly basis. How much money will you have after 5 years?
- Suppose you borrow \$500 to be repaid with 4.3% APR over 3 years with monthly payments. How much will you be paying in total interest?
- Suppose you deposit \$10.00 at the beginning of every month into an account that pays 1.7% APR at the end of each month. How much will you have after 42 months?

Coins, Dice and Small Sets

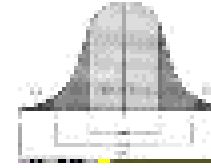


[My discrete probability app](#)

- If you toss ten coins, what is the probability of getting exactly 4 to land as heads?
- If every student has a 75% chance of passing a test what is the probability that out of a class of 35 there will be at least 25 passing grades?
- What is the probability of rolling less than 6 with two dice?
- If six out of ten apples in a bag are ripe, what is the probability of only picking two ripe ones when you pick three randomly?

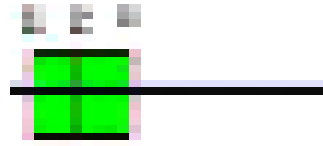
Large Sets – Normal Distribution

[My Continuous Probability App](#)



- If the average weight of a watermelon is around twenty pounds with a standard deviation of 1.6 pounds, what is the probability that a random melon will weigh more than 21 pounds?
- Graph the probability distribution showing the probability of a melon weighing between 16 and 19 pounds.
- The heaviest 25% of the melons would weigh at least how many pounds?

Statistical Calculations



[1-variable statistics app](#)

Using the following data values:

19,26,48,45,50,56,35,10,10,35,67,66,46,35,35,29,10,65,66,35

calculate the values in this poem:

Hey diddle diddle,

- the median's the middle;
- you add and divide for the mean.
- The mode is the one that appears the most,
- and the range is the difference between.

Thank you for your attention!