2. Memorization

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   269
×   78
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The second point I'd like to mention is memorization.

Imagine trying to multiply 269 by 78 without knowing your times tables.

All of maths is like this. You need to have some facts memorized to be able to attempt the next topic.

2 x 8 = ?   6 x 8 = ?   9 x 8 = ?

2 x 7 = ?   6 x 7 = ?   9 x 8 = ?

long multiplication

the times tables

We need to know addition to understand multiplication.
We need to know times tables to do long multiplication.
We need to be able to multiply to work with fractions.
Both algebra and geometry rely on proficiency with fractions.
and so on, and as we have seen,
the language of the physical world is understood through knowledge of Calculus.

Leaving gaps in the building of your knowledge erodes your confidence.

calculus

trigonometry

analytic geometry

algebra | geometry

fractions

long multiplication

times tables

simple addition


Memorized facts
serve as stepping stones
On our journey of mathematical discovery,
memorized facts help us proceed to our goal.

Mathematics is like Law.

If you are arguing a case,

before a judge,


you need to have memorized some important cases.
That is how law works.

You need to know some facts to base your arguments on.
Studying law involves plenty of memorization.

Reasoned arguments stand on memorized facts.

Reasoned Arguments stand on memorized facts.

Mathematics is the same.

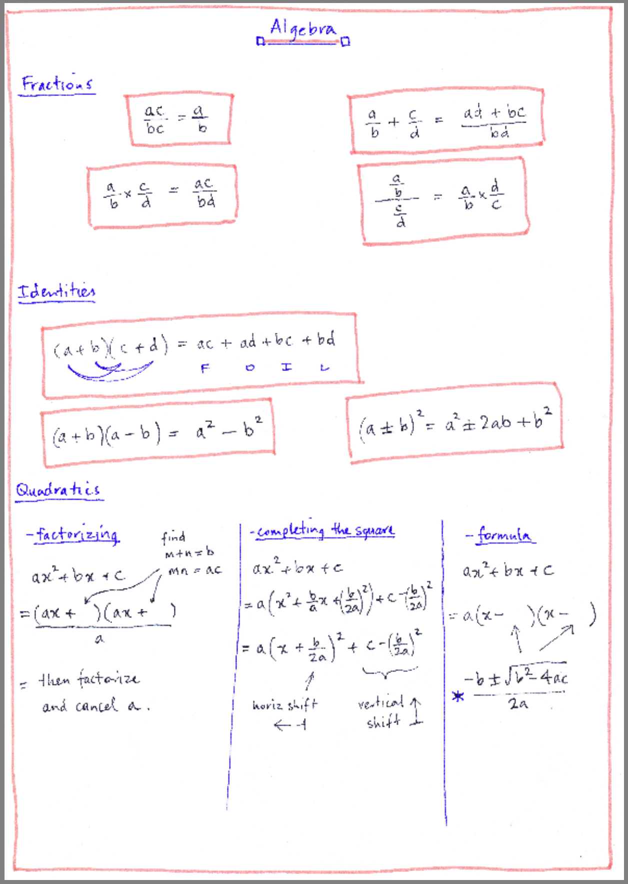
and

"What???"
Am I advocating "Drill and Kill???" you may be asking.

checking recall of key formulas

Well, memorization doesn't have to be unpleasant.
It can have all the soul warmth of sitting together on the couch and sharing a story.

Though students should not always expect it to be fun.



And memorization doesn’t have to be painful. In fact it can be almost effortless.
I always ask my students make a summary and post
it on the back of the toilet door. It’s the eeeasy way to memorize.

Hopefully your toilet has more room than this one.

effortless

How Mathematics?

some memorization

and lots of practice

How do you learn mathematics?
- by some memorization, and lots of practice.
Carl Gauss is regarded as the greatest mathematician.

If we asked him, he would certainly agree.
He had memorized the log tables.