The alternati
billions o

... and it is with great difficulty that
I selected the student Charley

Ricky, you ever think…
what if it's too much?

Programming, algorithms...
What if we can't keep up?

Dany, my man,
when have you ever
not aced a test?

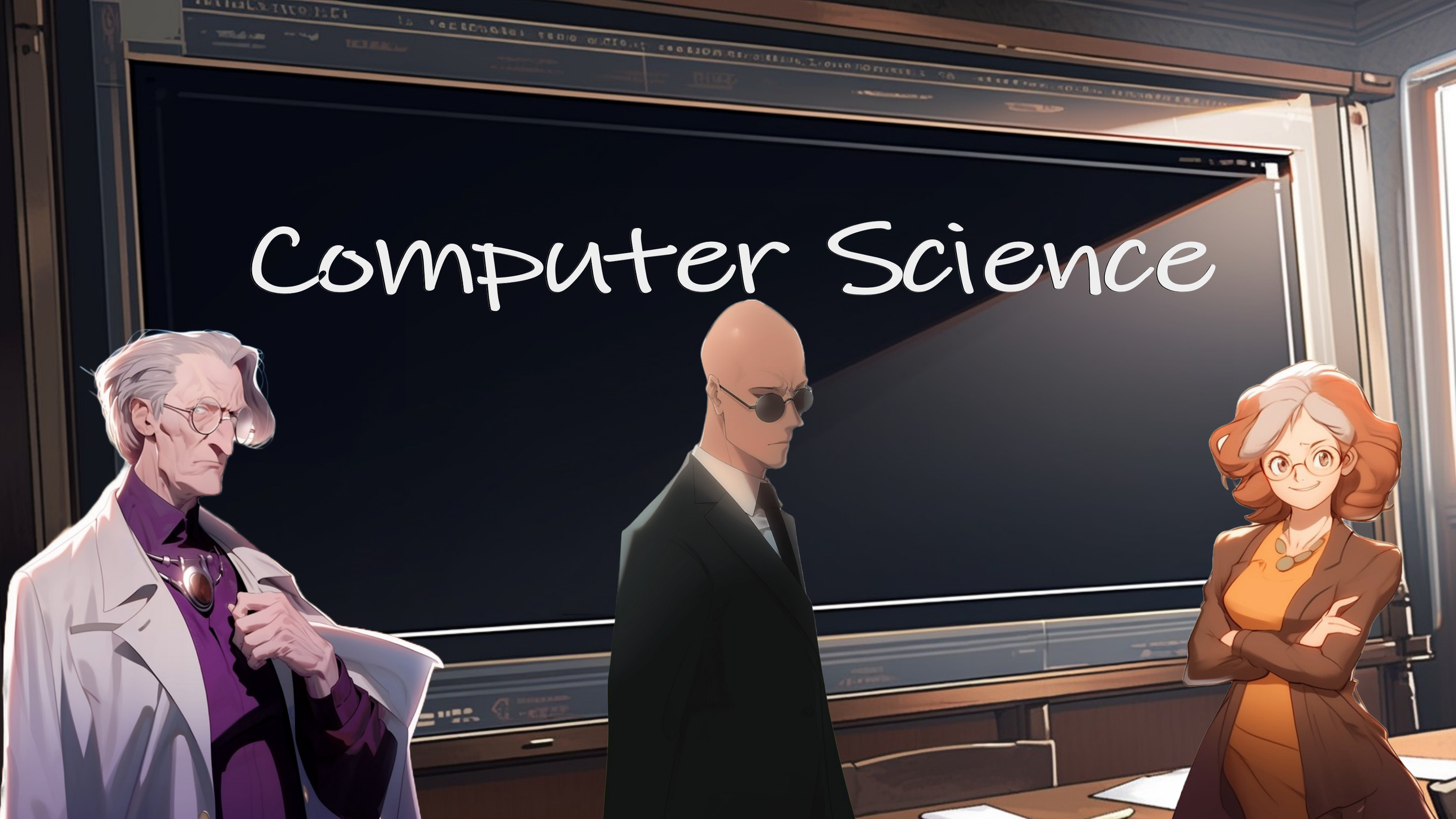
One for Harvard
and one for Oxford

You worry about
everything!

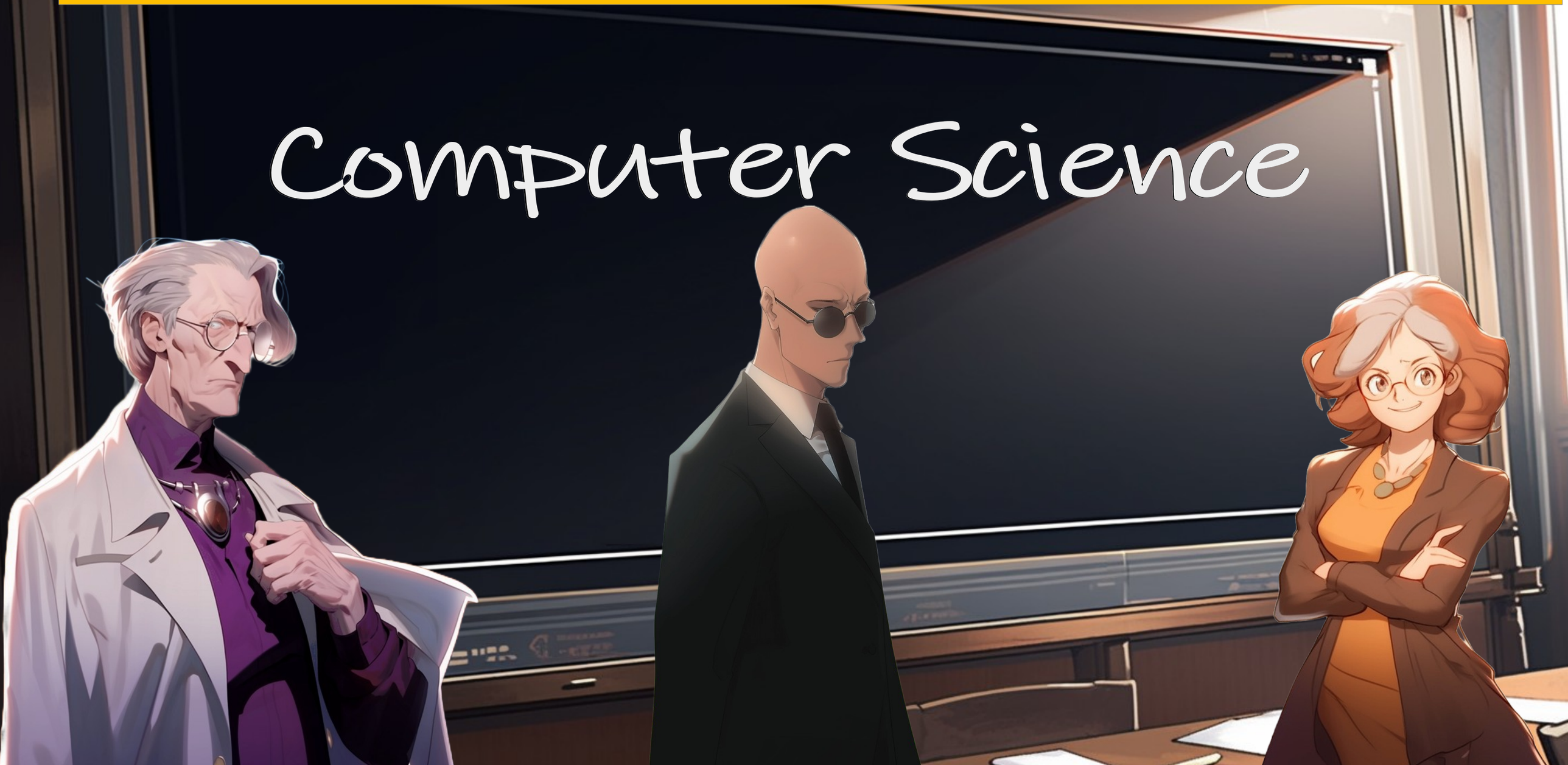
And so, with evident reluctance, the UN approved and established UPU,
Ultimate Programming University, granting it exceptional permissions.

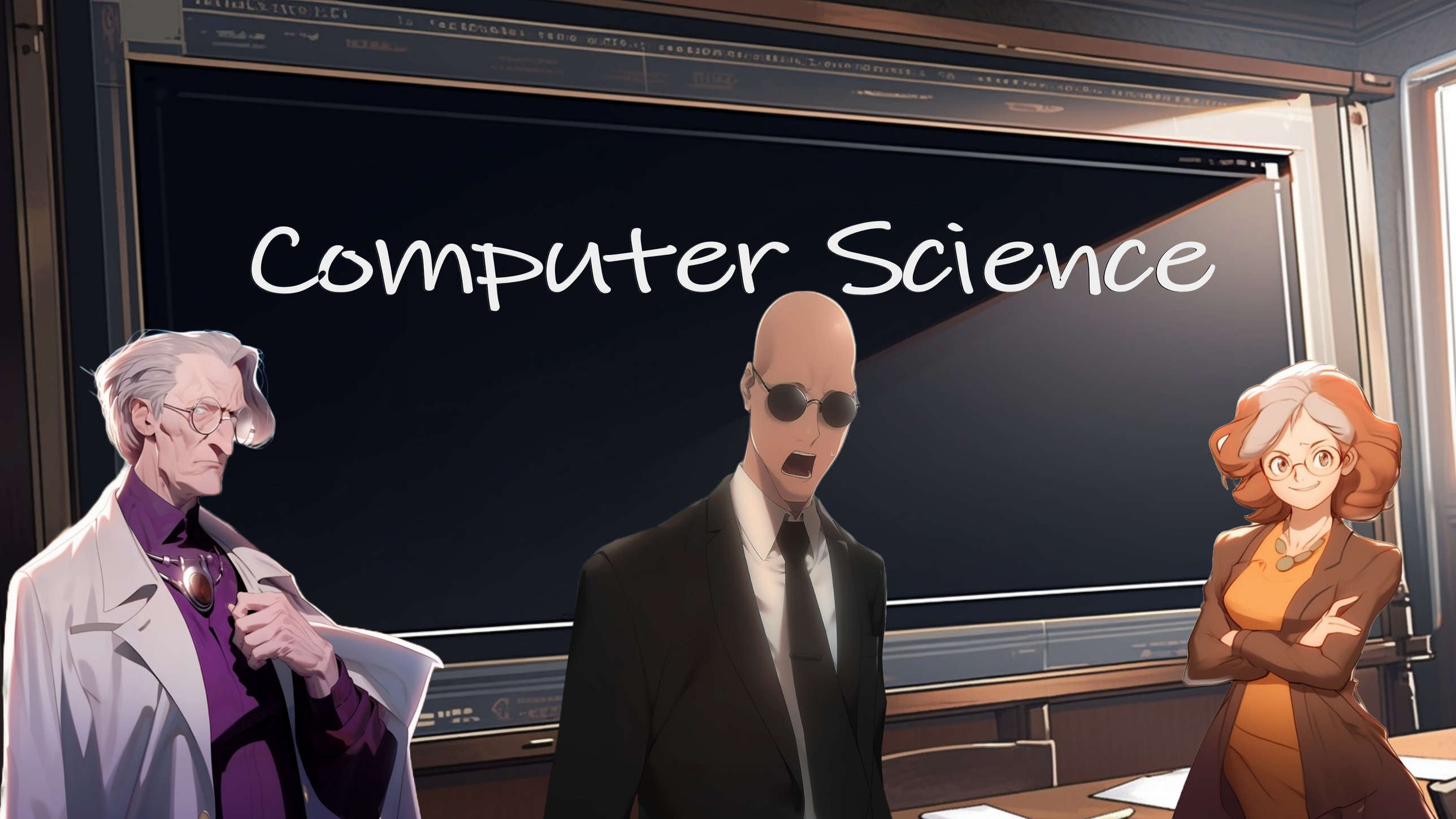
And so, the first lecture starts

Computer Science

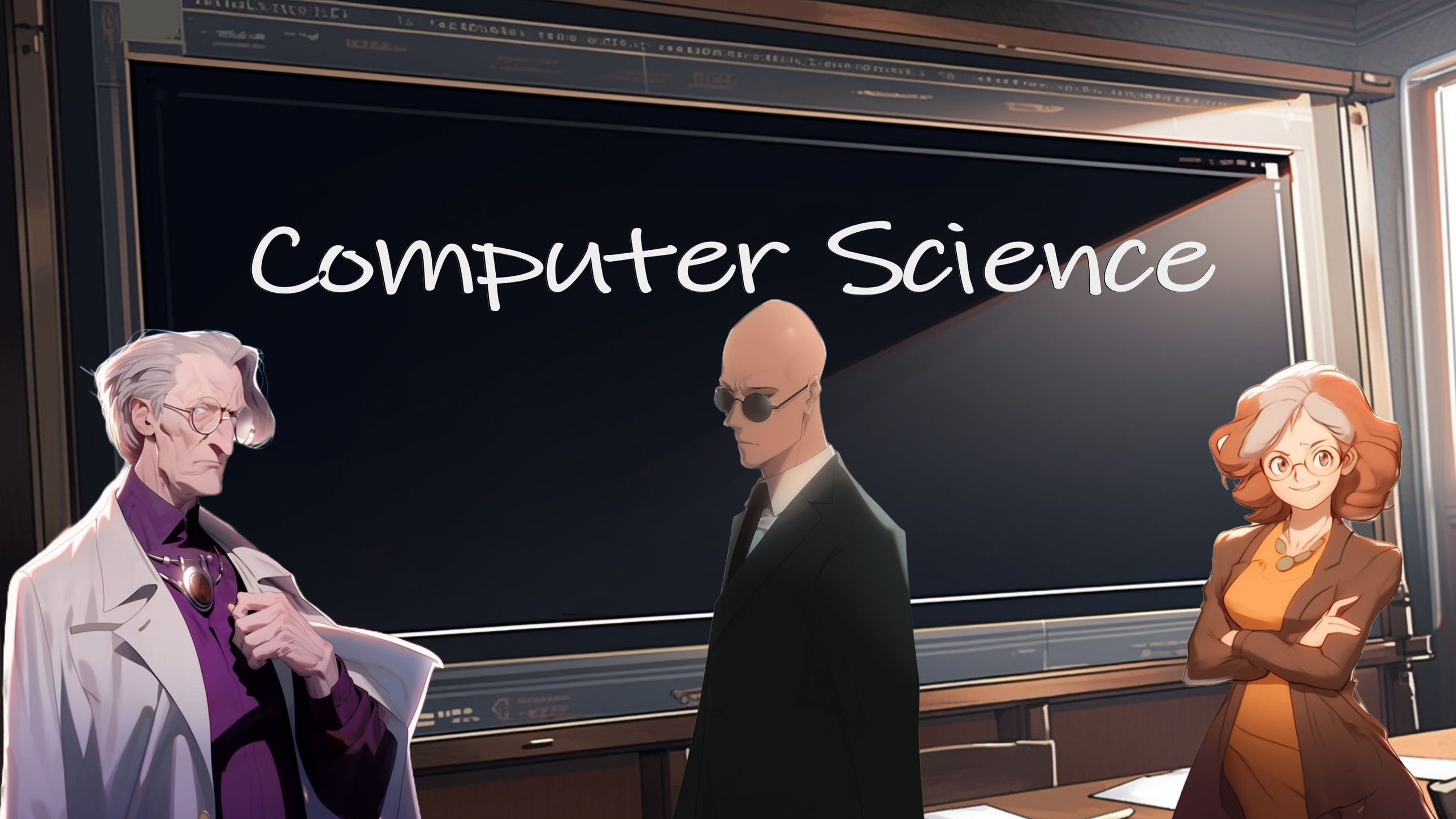

Computer Science

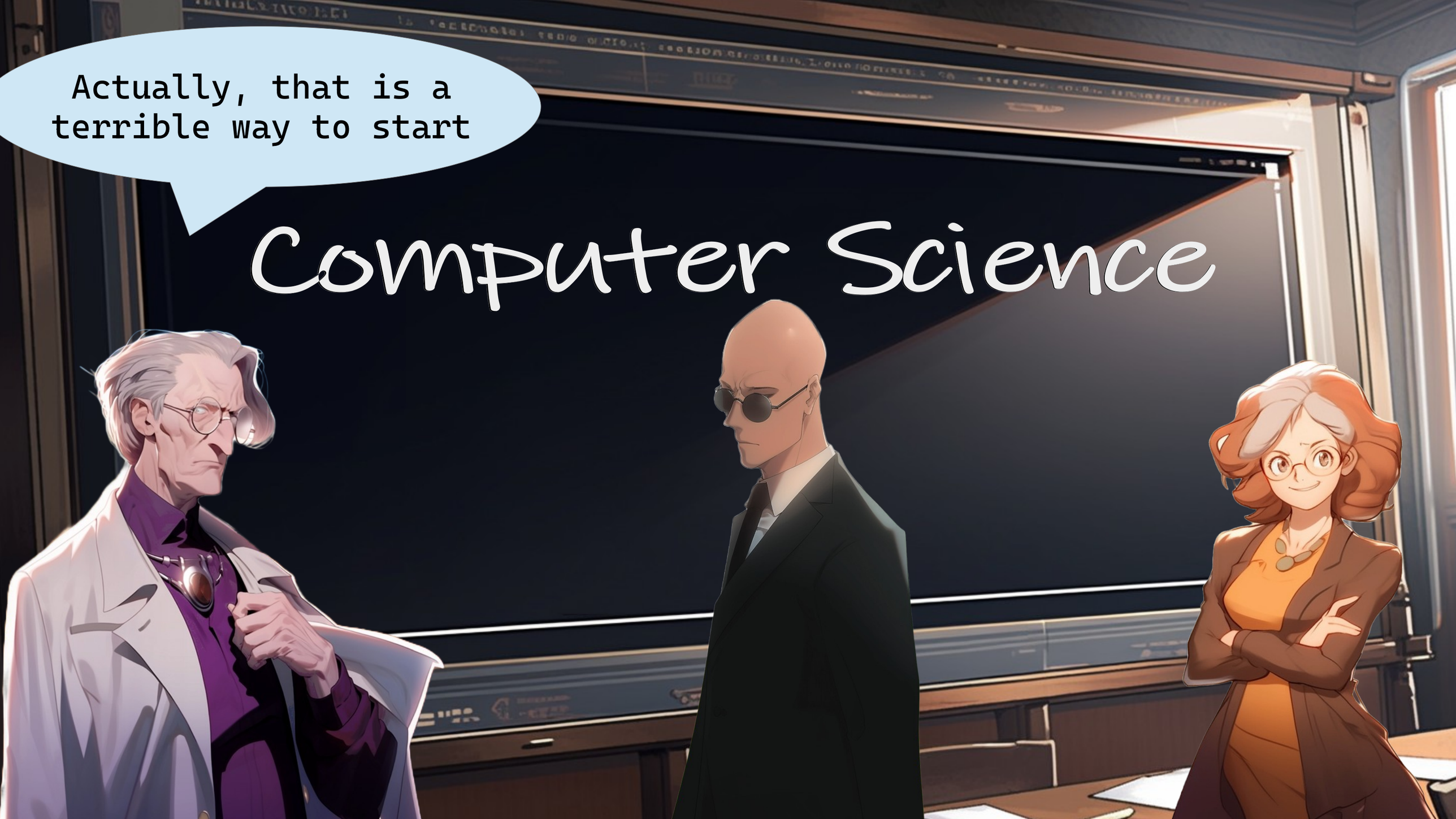
The first lecture sports three Lectures, Mortis, Pupon and Pumpkin

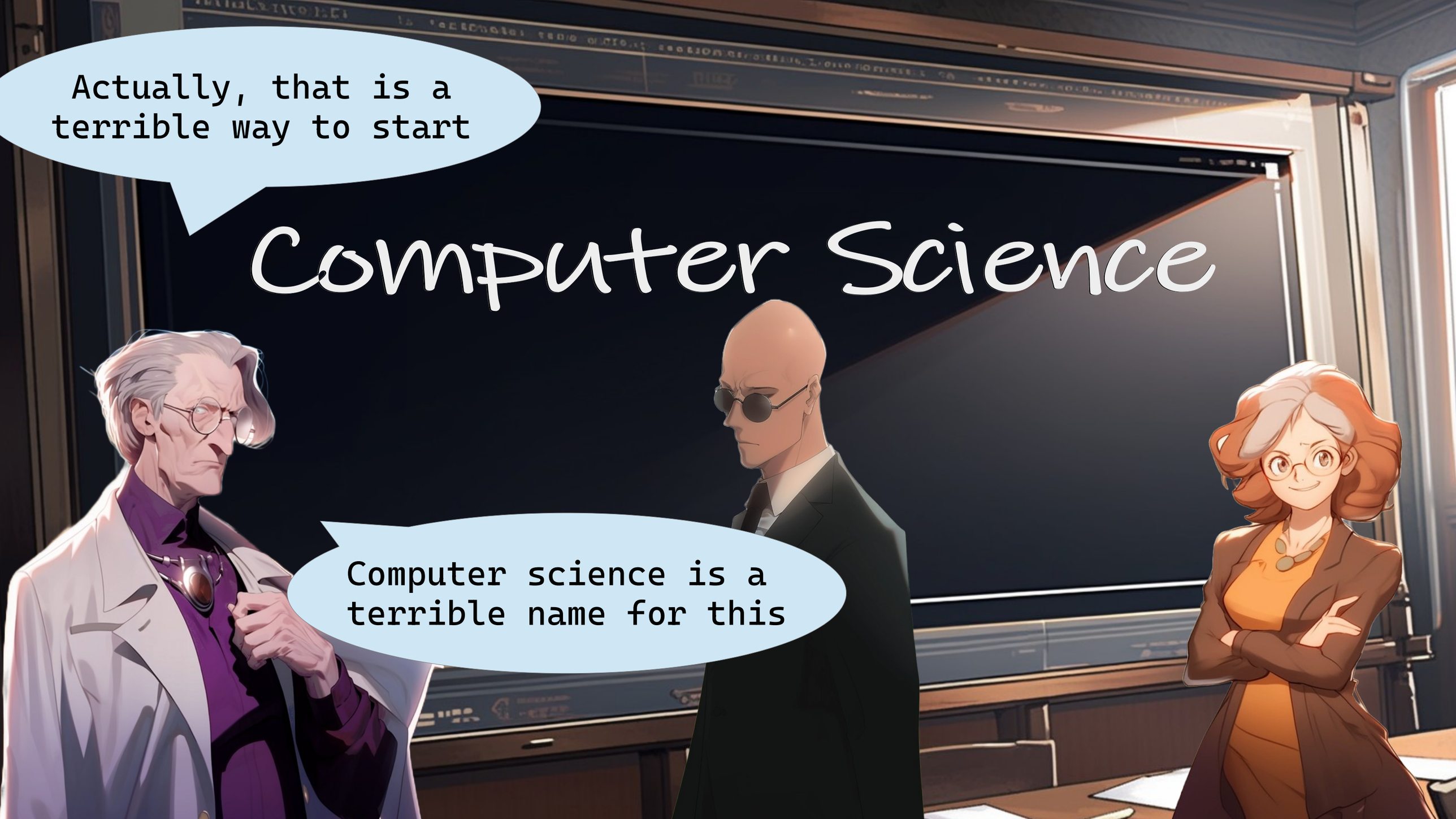



Computer Science

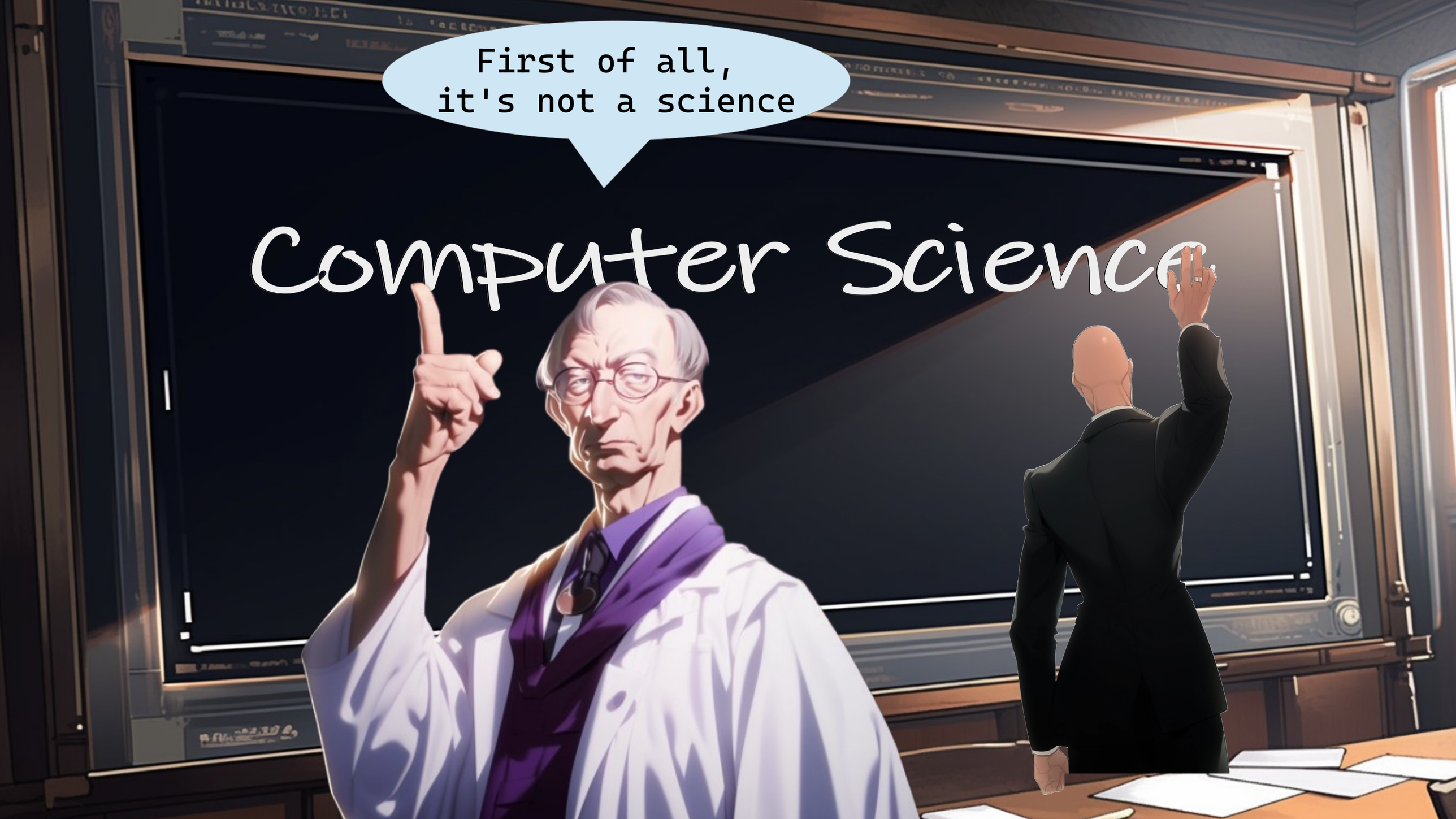
I welcome you to this course on computer science
Computer Science


Computer Science


Actually, that is a terrible way to start
Computer Science

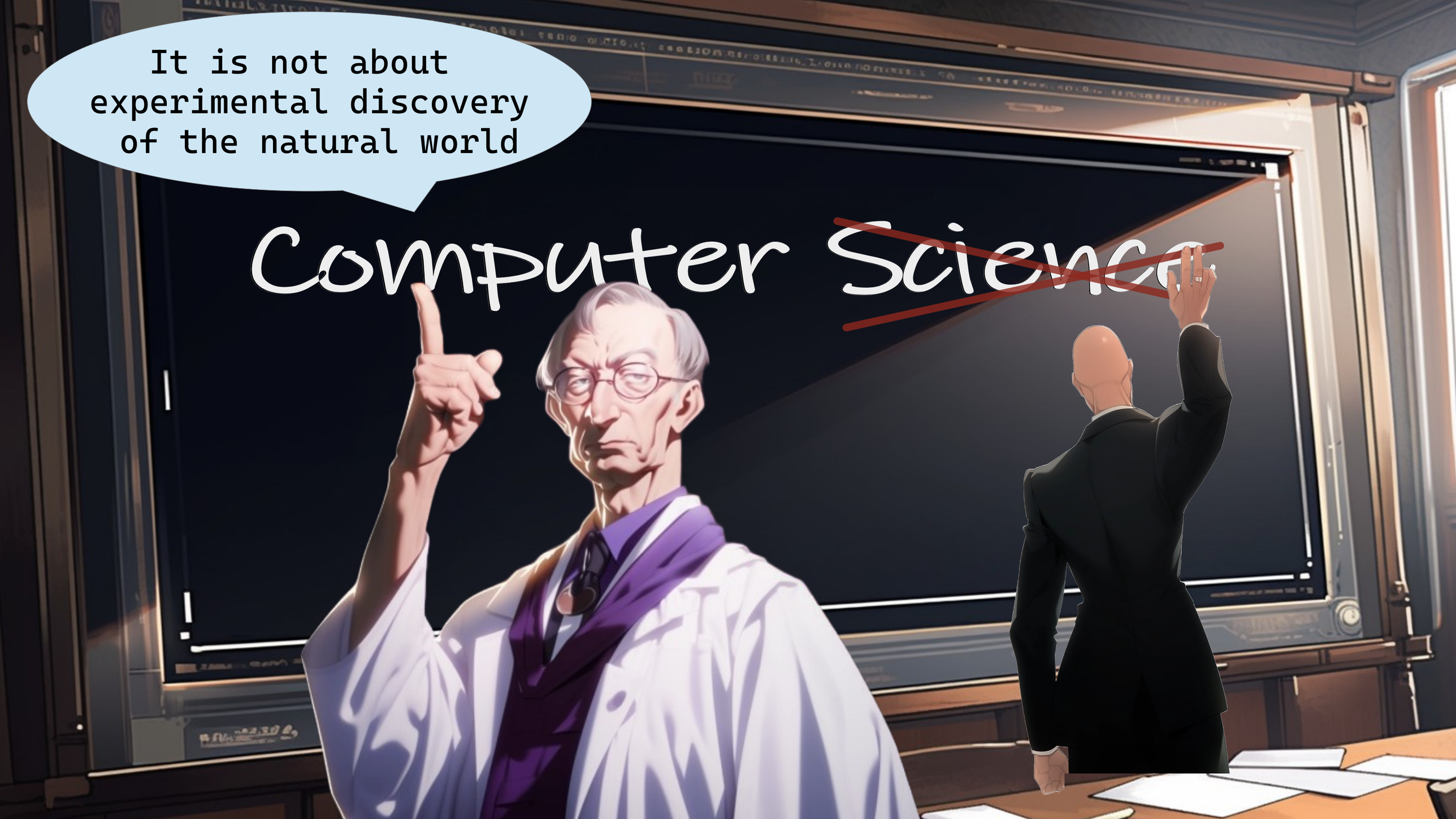

Actually, that is a terrible way to start
Computer Science
Computer science is a terrible name for this

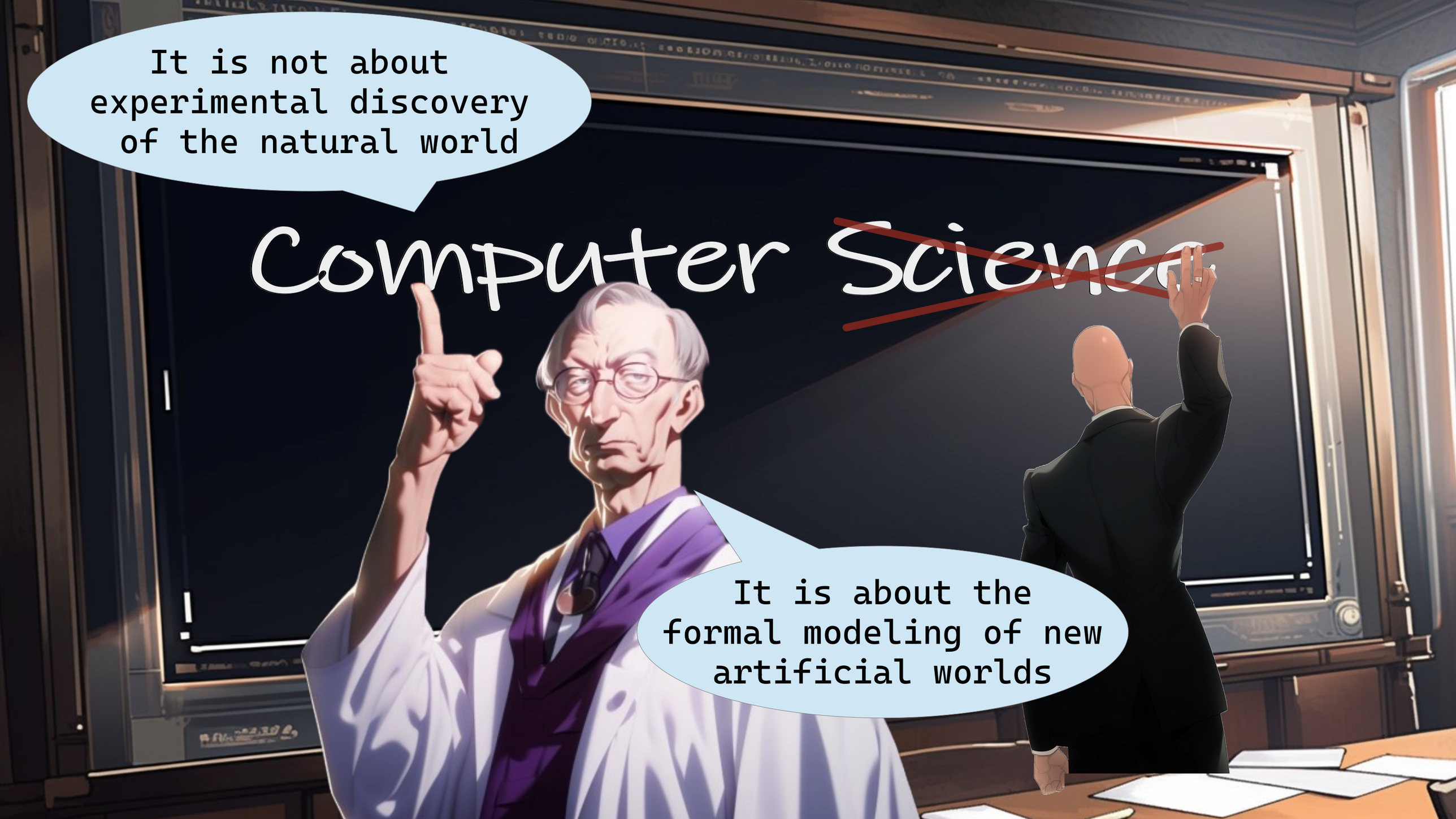
Computer Science

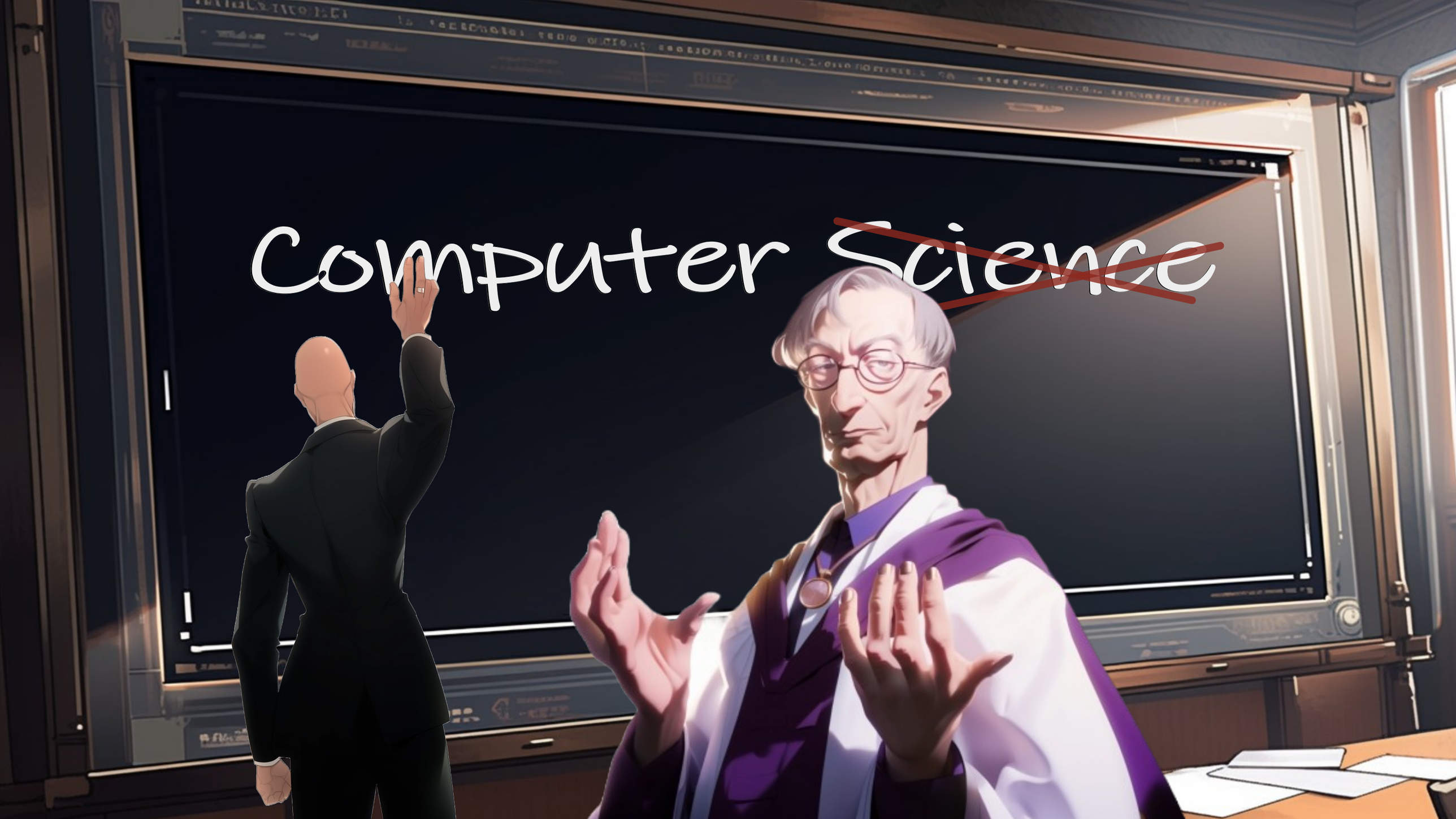

First of all,
it's not a science
Computer Science

Computer Science

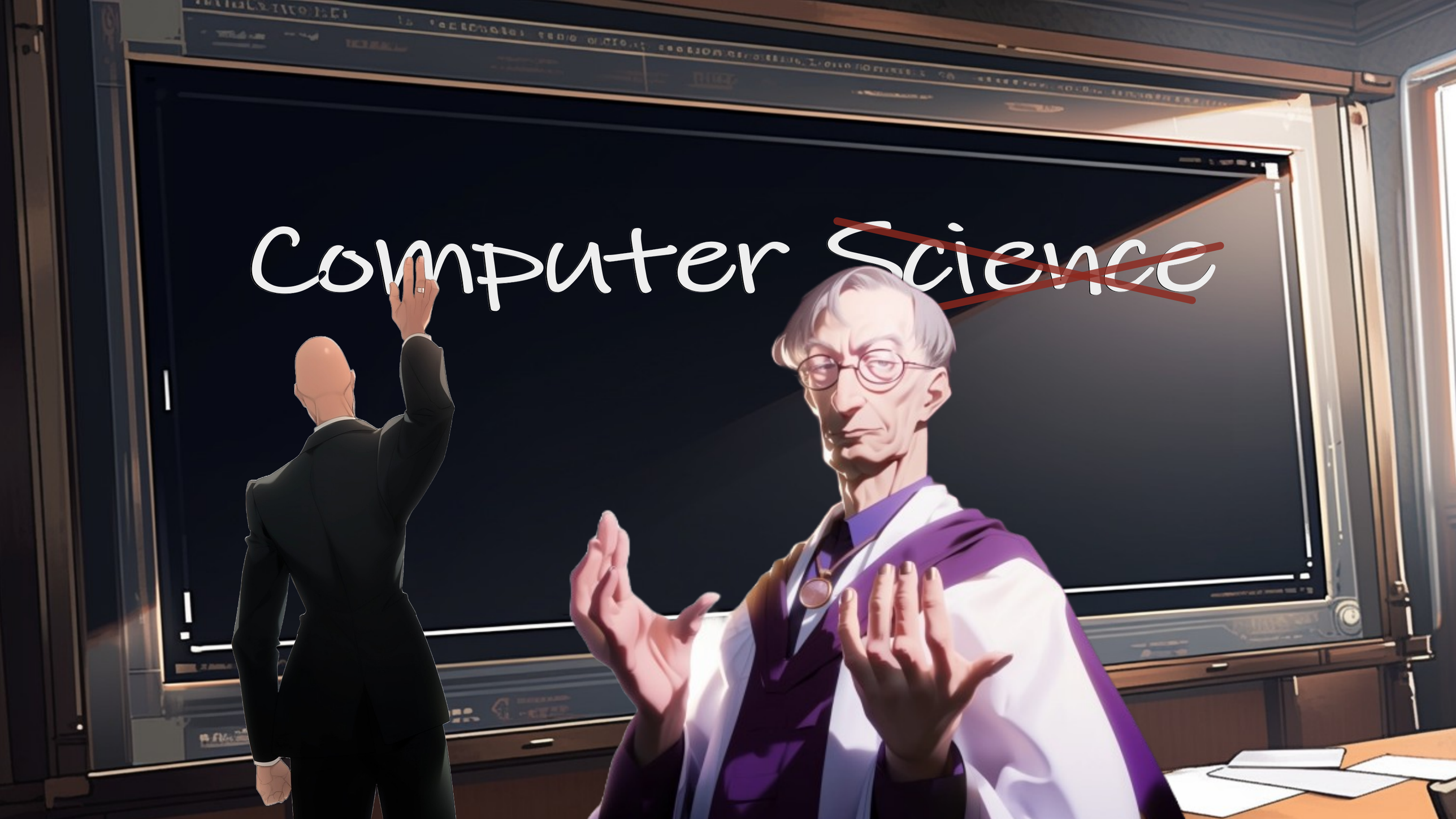
Computer Science

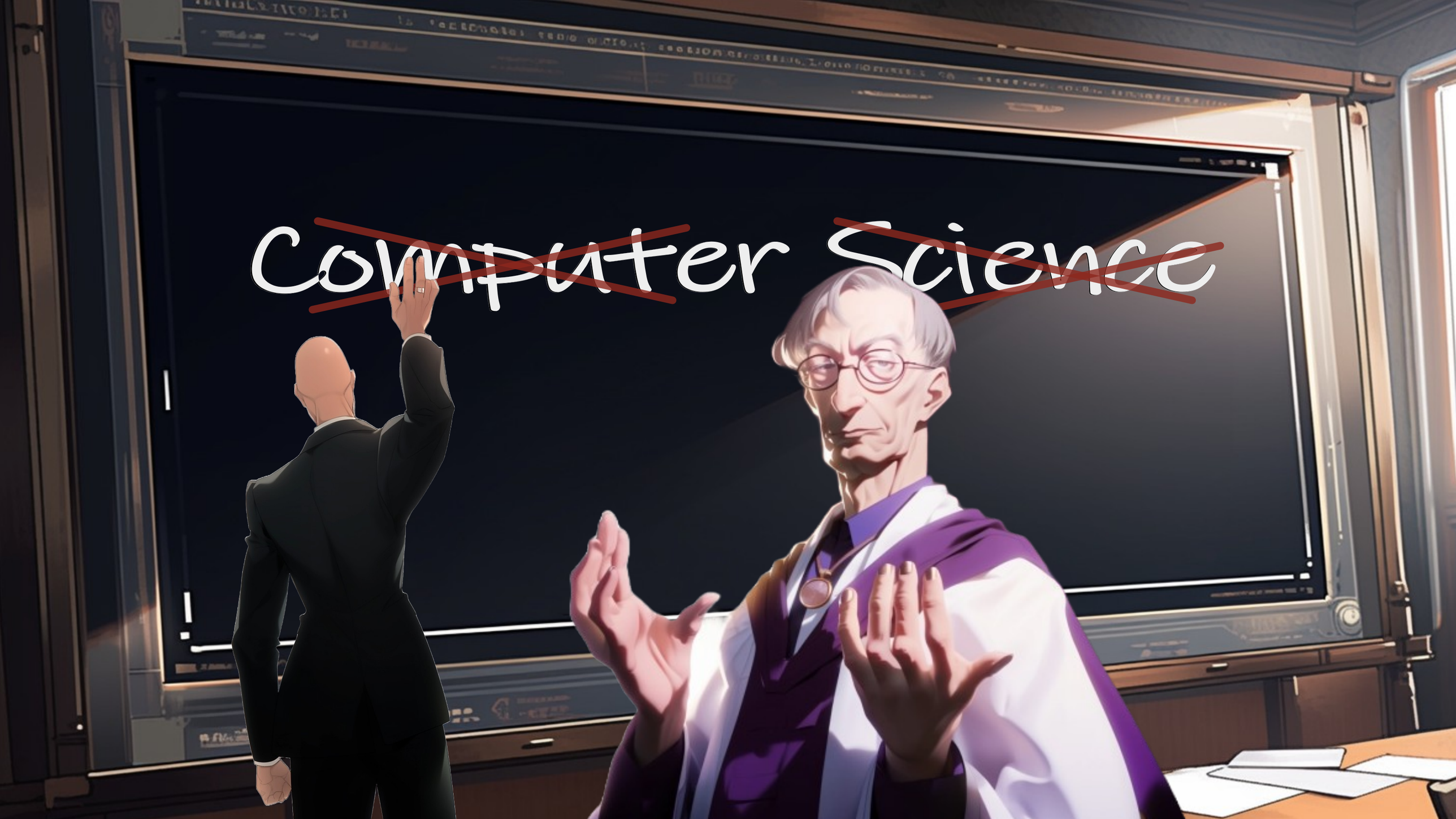

It is not about experimental discovery of the natural world
Computer Science


It is not about experimental discovery of the natural world
Computer Science
It is about the formal modeling of new artificial worlds

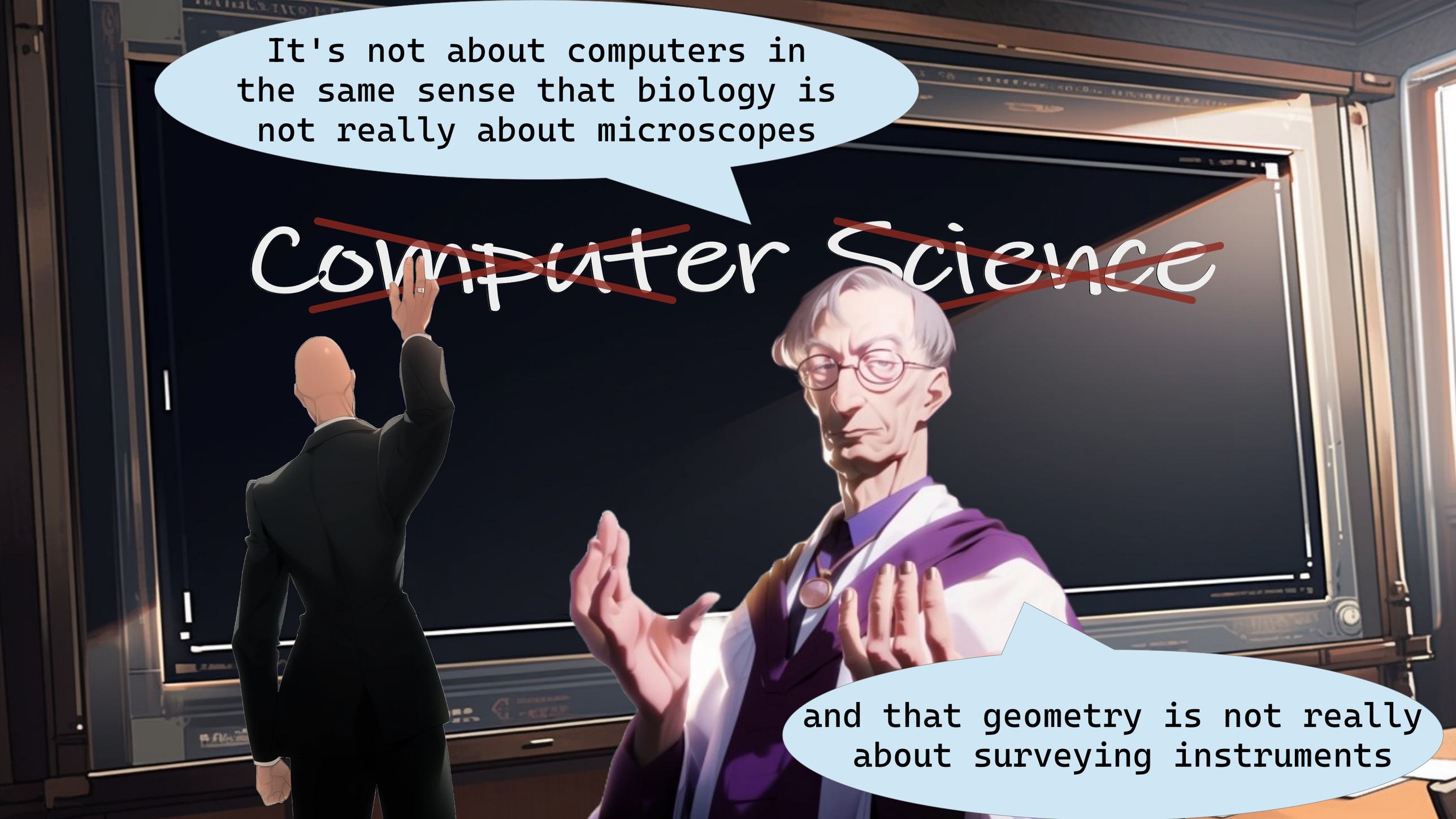

Computer Science

So it's not a science.
It's also not really
about computers
Computer Science


Computer Science

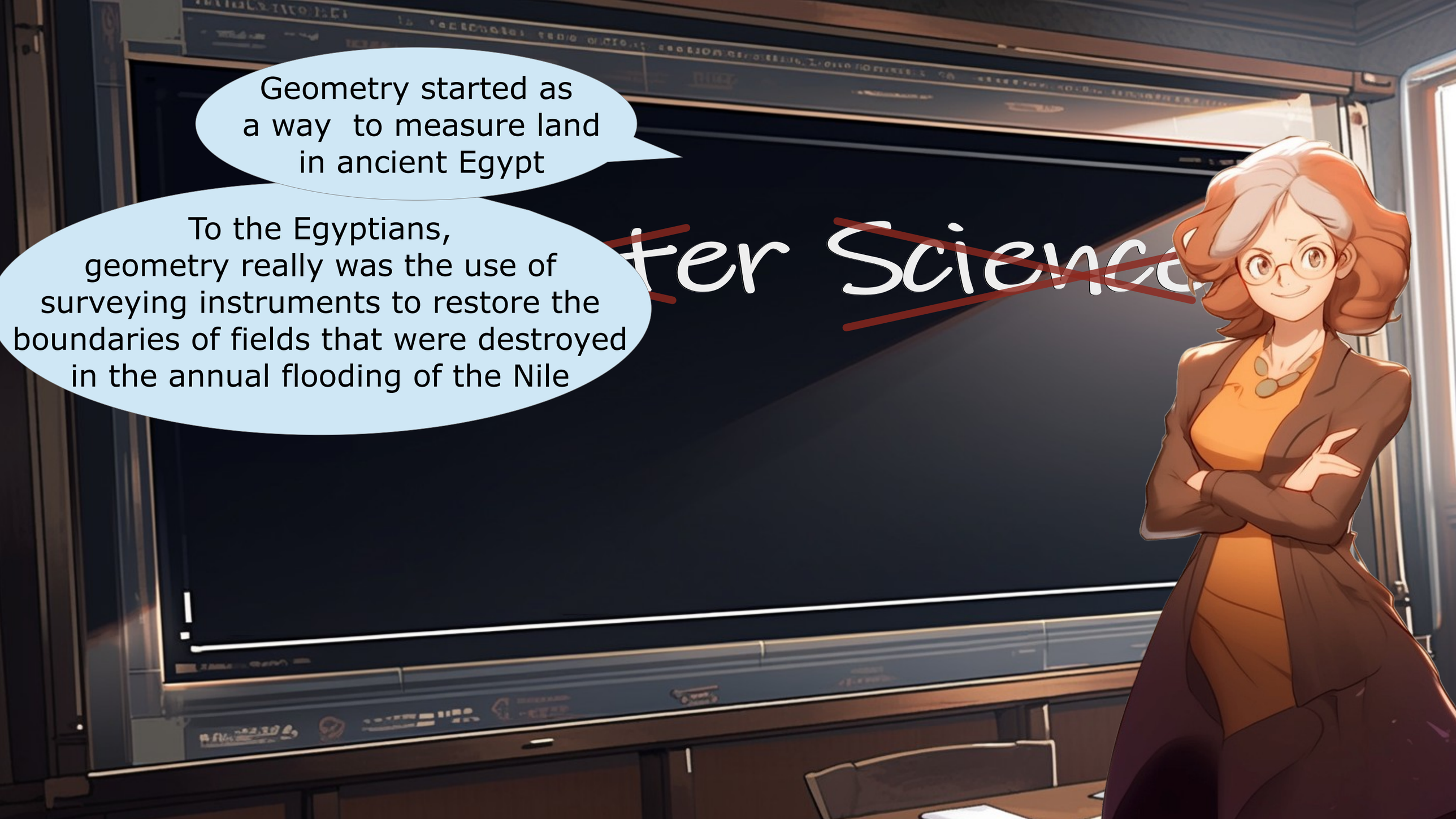

~~Computer Science~~

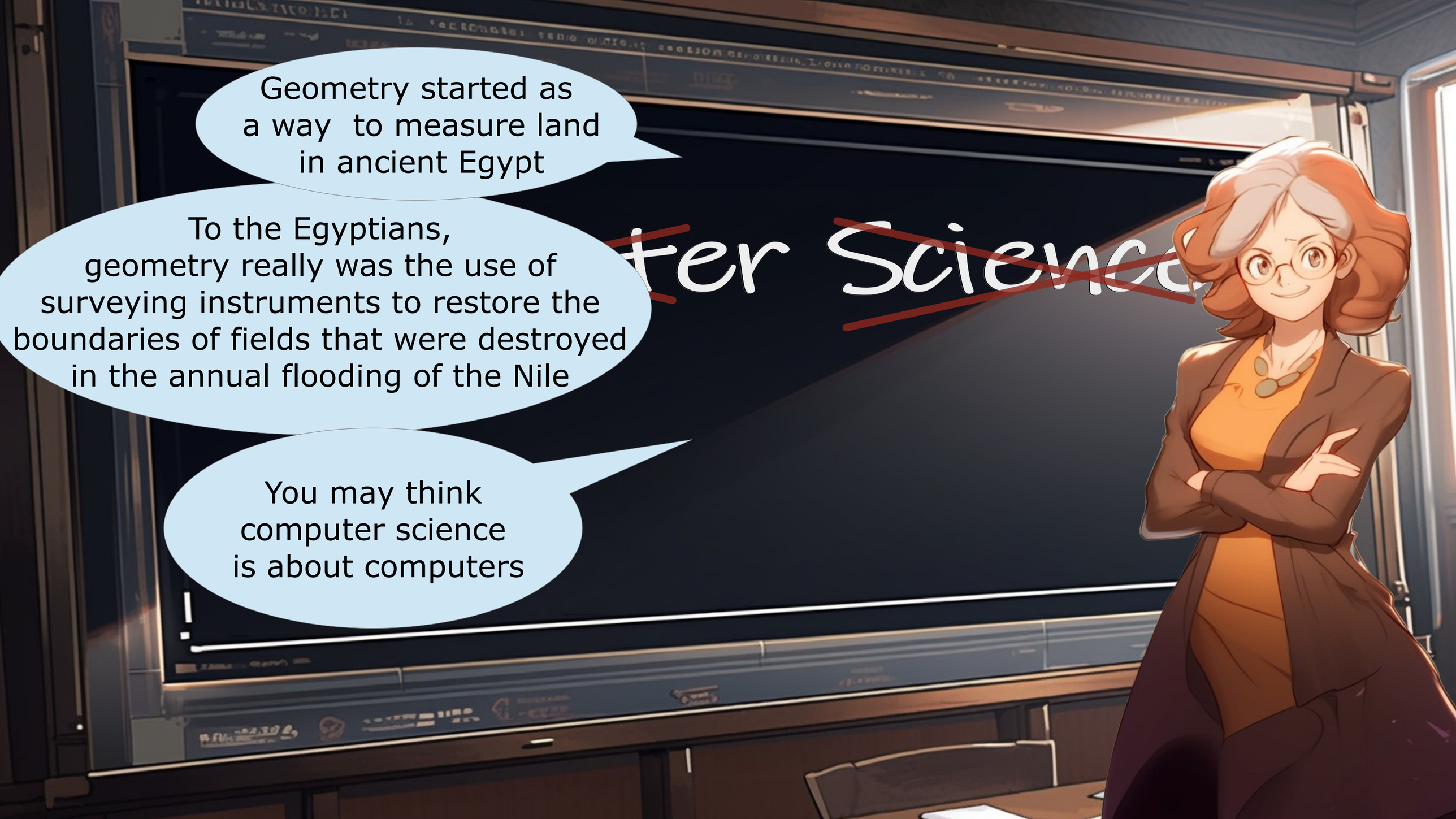
It's not about computers in the same sense that biology is not really about microscopes
~~Computer Science~~


It's not about computers in the same sense that biology is not really about microscopes
Computer Science
and that geometry is not really about surveying instruments

~~Computer Science~~

Geometry started as
a way to measure land
in ancient Egypt
~~Computer Science~~


Geometry started as a way to measure land in ancient Egypt
To the Egyptians, geometry really was the use of surveying instruments to restore the boundaries of fields that were destroyed in the annual flooding of the Nile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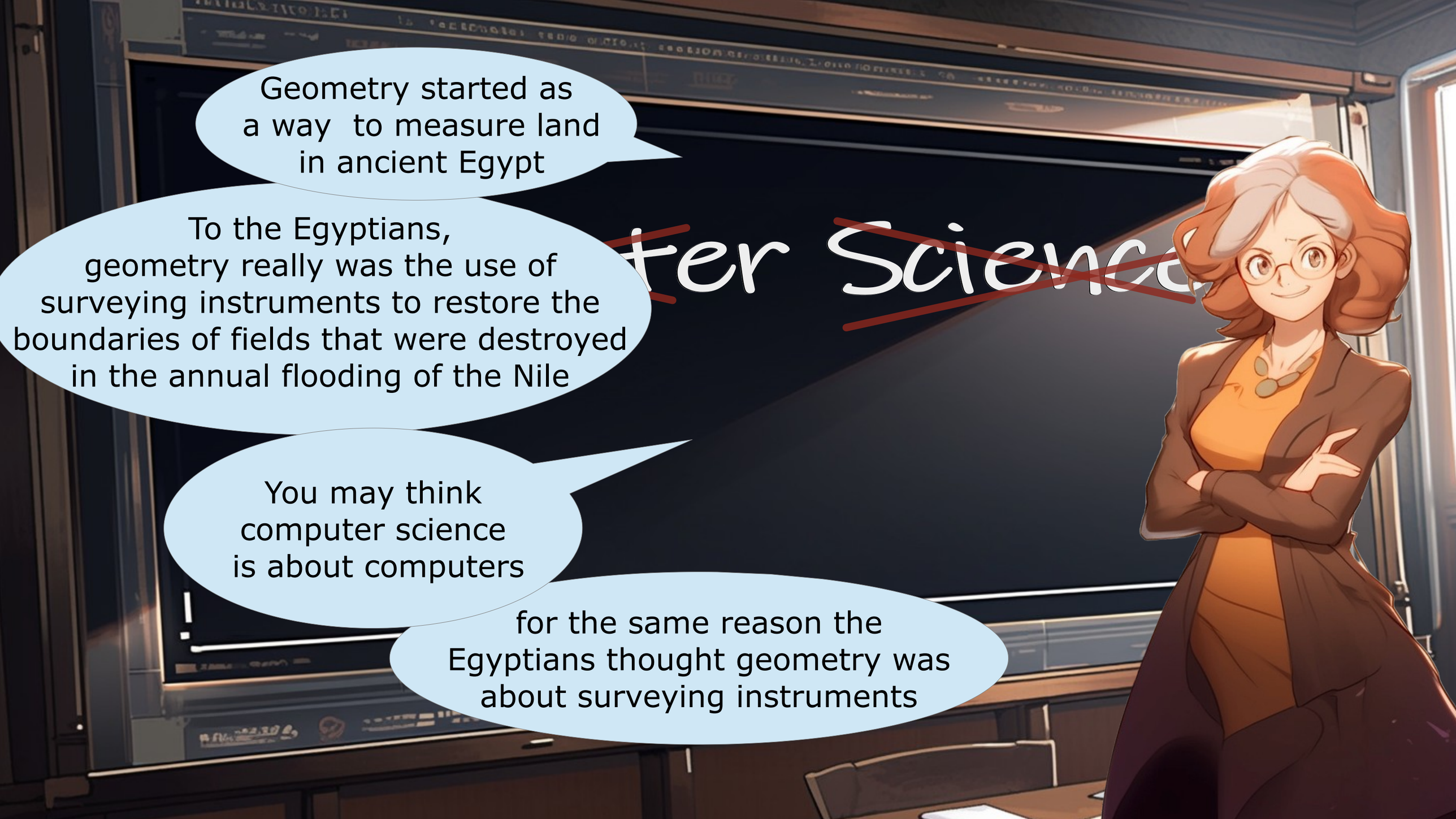
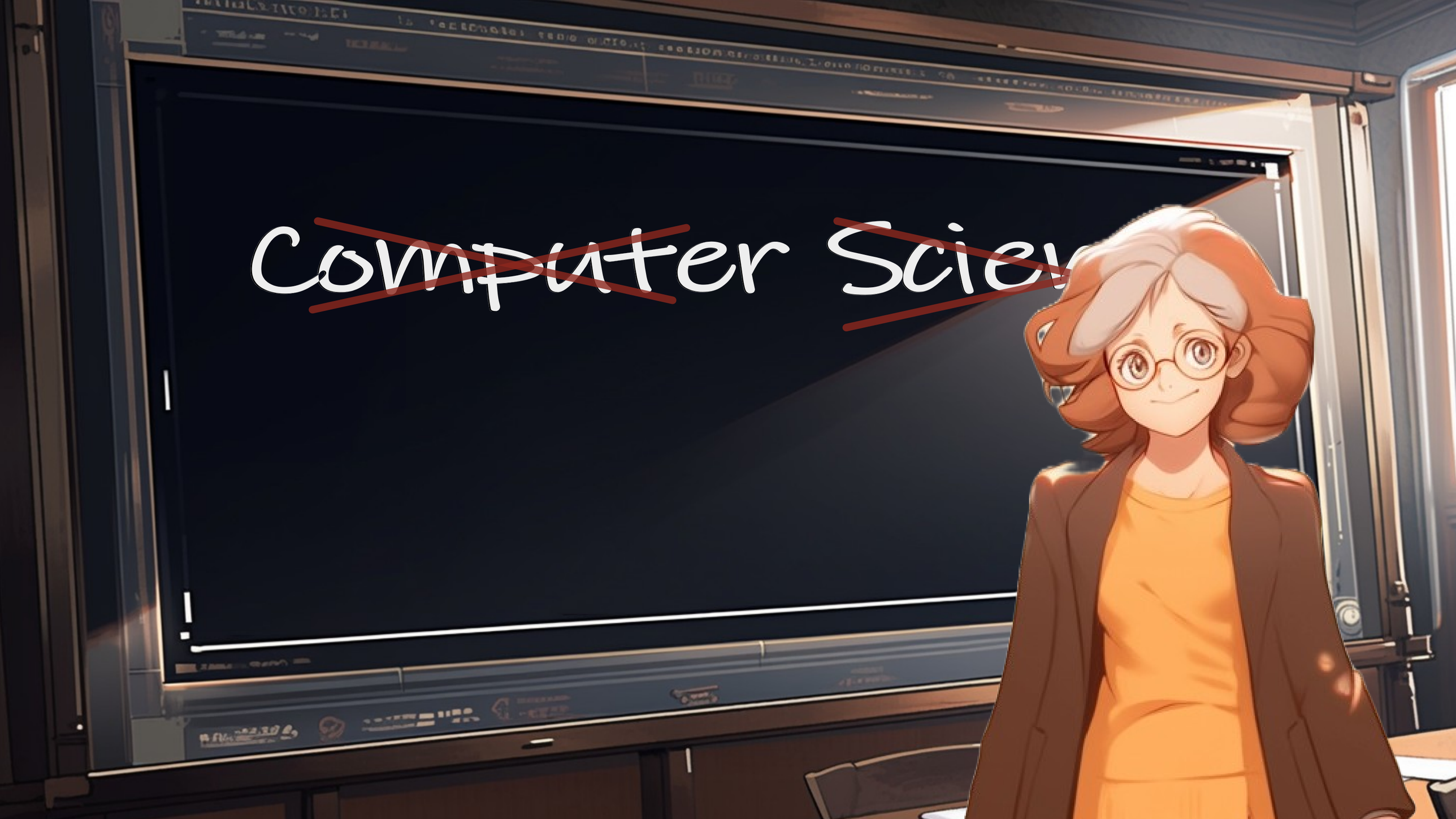
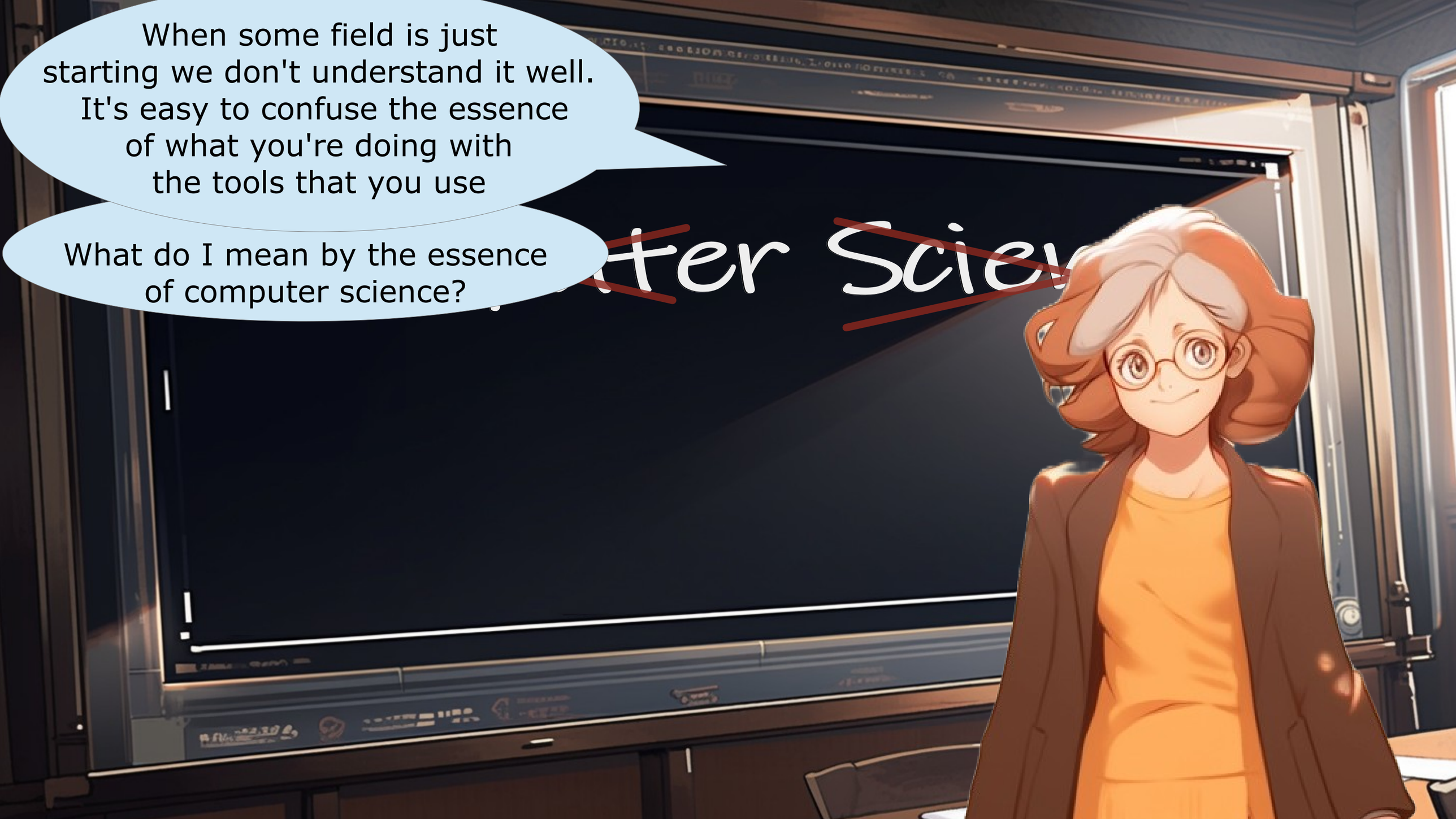
You may think computer science is about computers


Geometry started as a way to measure land in ancient Egypt
To the Egyptians, geometry really was the use of surveying instruments to restore the boundaries of fields that were destroyed in the annual flooding of the Nile
You may think computer science is about computers
for the same reason the Egyptians thought geometry was about surveying instruments


~~Computer Scie~~

When some field is just starting we don't understand it well. It's easy to confuse the essence of what you're doing with the tools that you use
~~Computer Scie~~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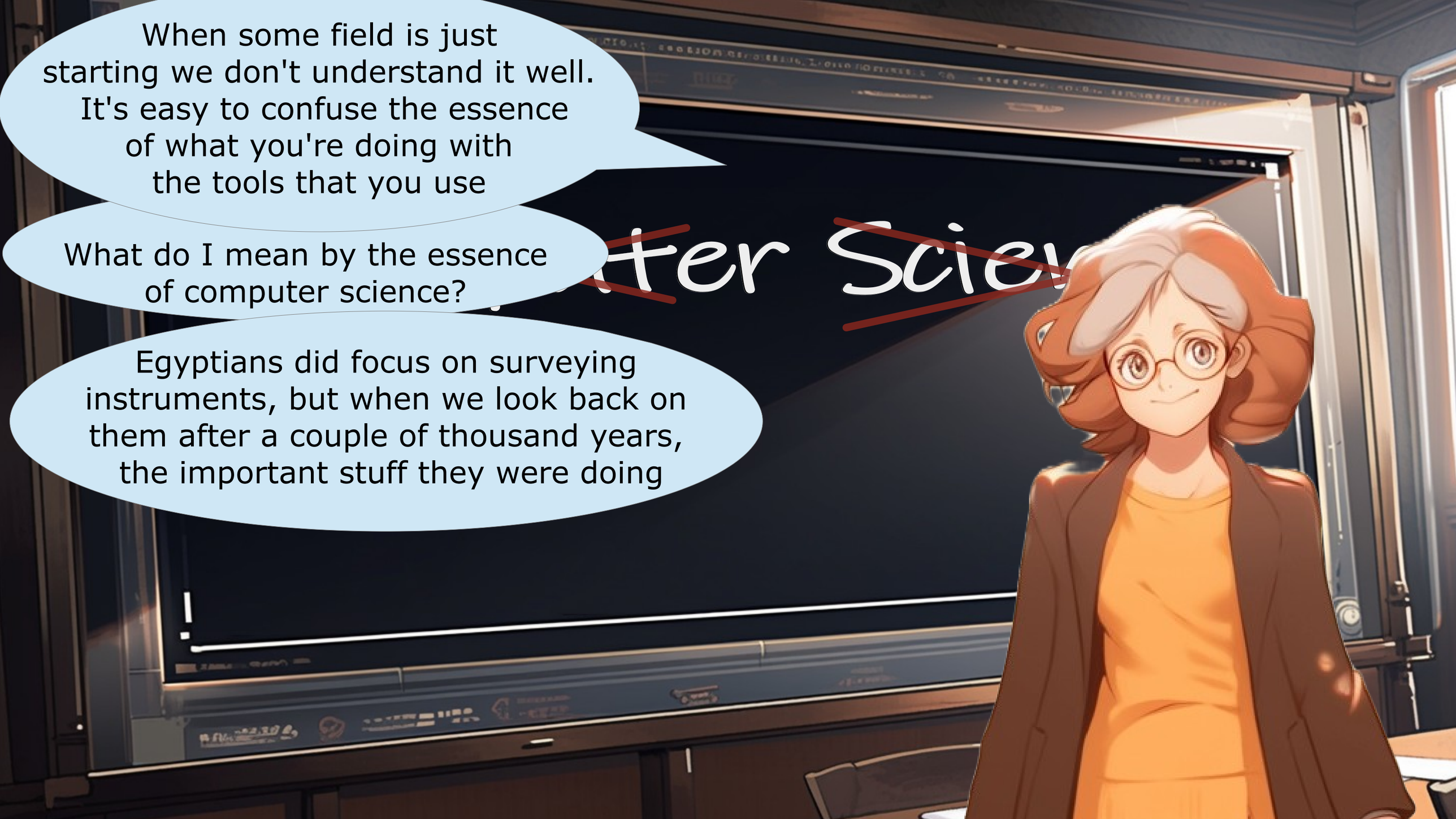
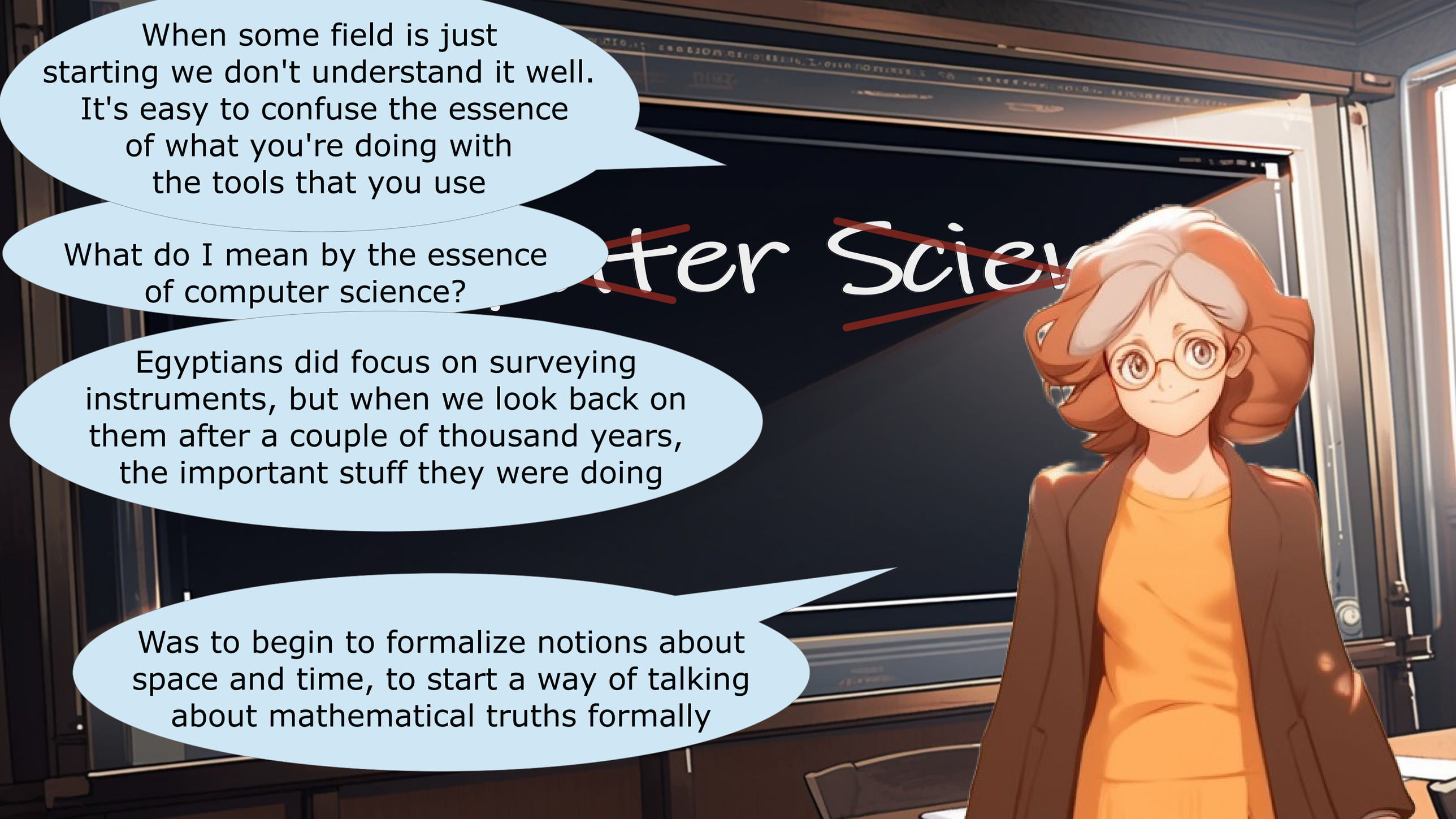
What do I mean by the essence of computer science?


When some field is just starting we don't understand it well. It's easy to confuse the essence of what you're doing with the tools that you use
What do I mean by the essence of computer science?
Egyptians did focus on surveying instruments, but when we look back on them after a couple of thousand years, the important stuff they were doing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What do I mean by the essence of computer science?
Egyptians did focus on surveying instruments, but when we look back on them after a couple of thousand years, the important stuff they were doing
Was to begin to formalize notions about space and time, to start a way of talking about mathematical truths formally

~~Computer Science~~

~~Computer Science~~

Similarly, future people will look at you and say
~~Computer Science~~

Similarly, future people will look at you and say
Yes,
~~Computer Science~~

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Yes, those primitives were fiddling around with these gadgets called computers
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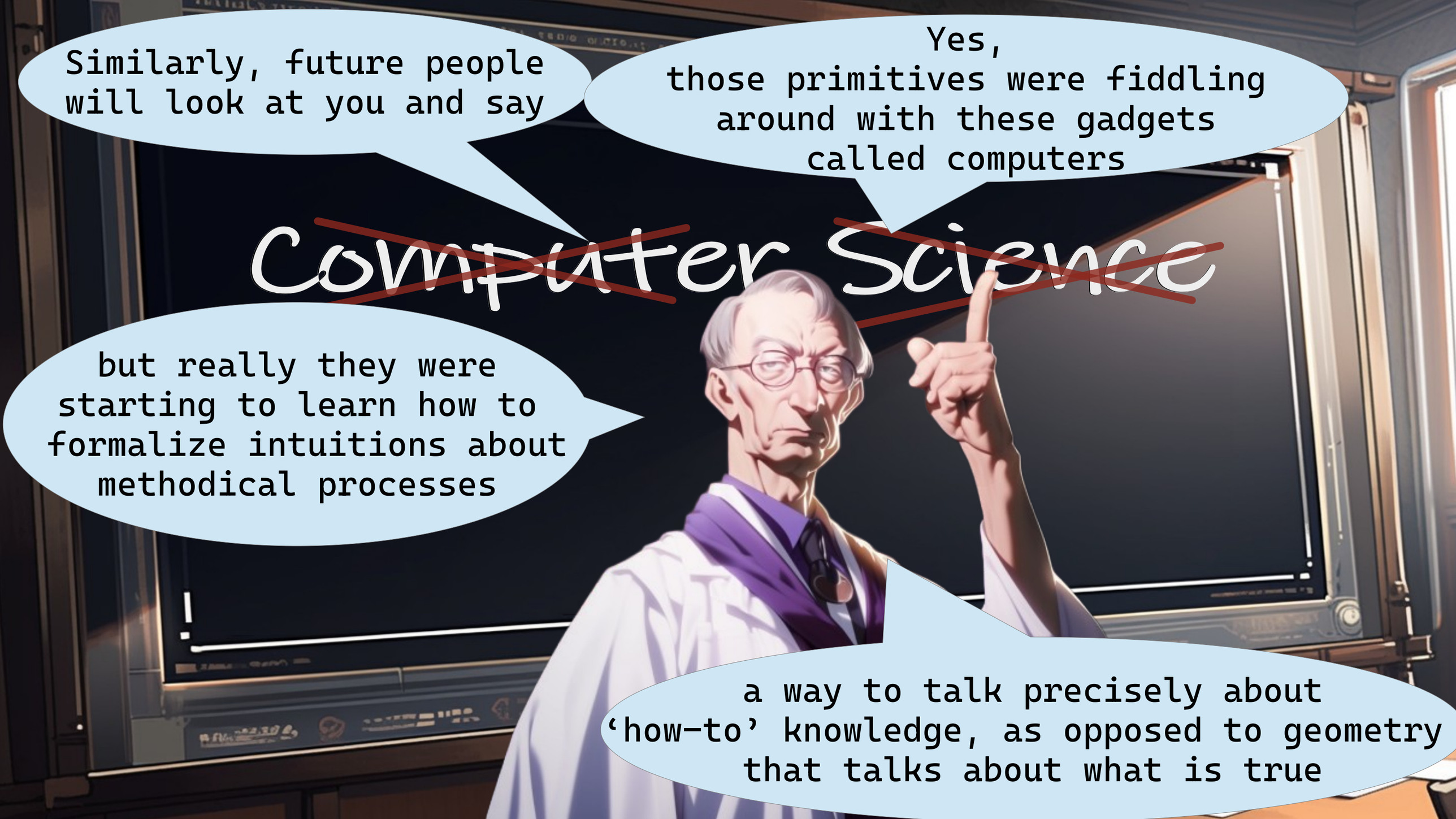
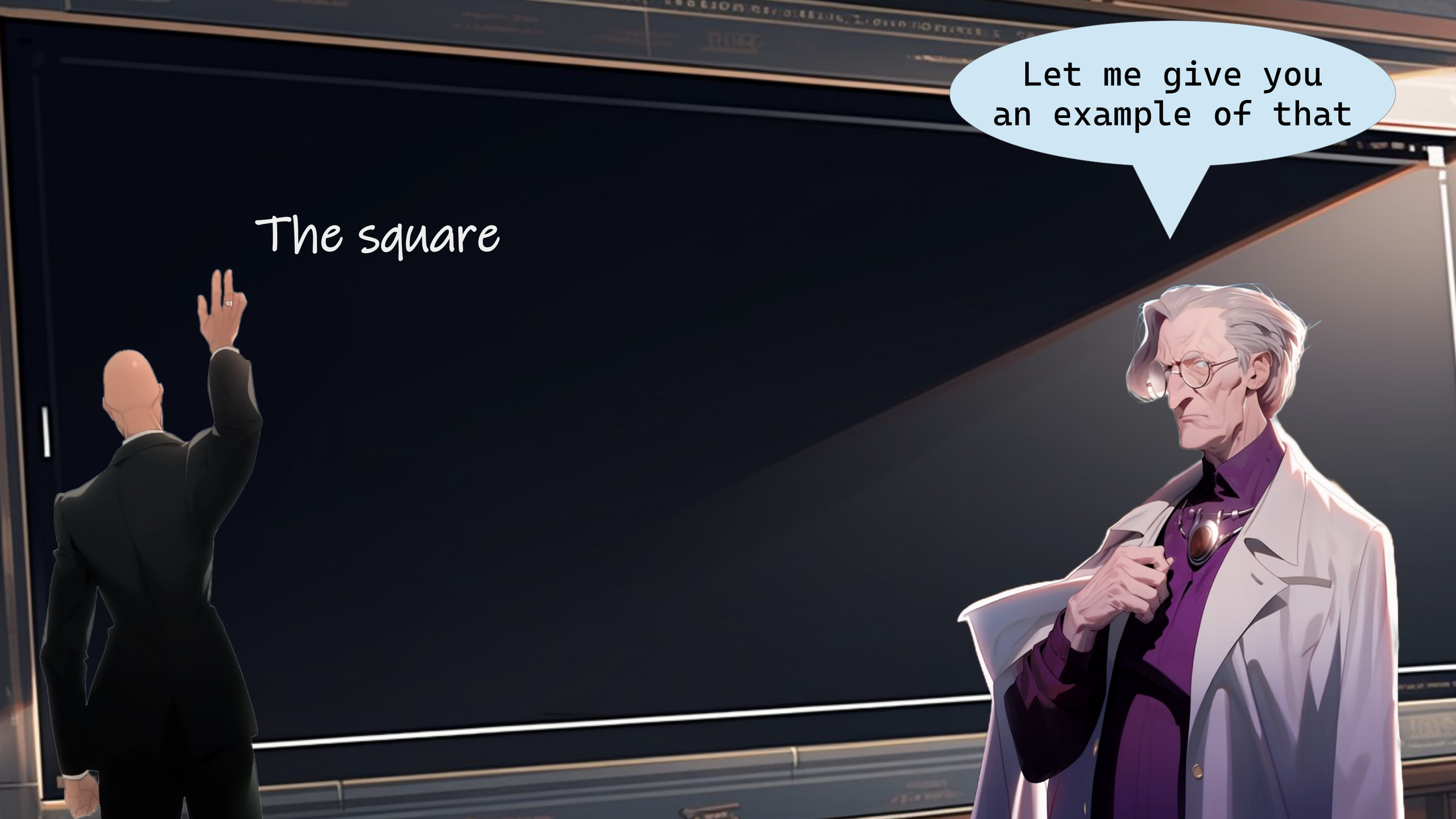
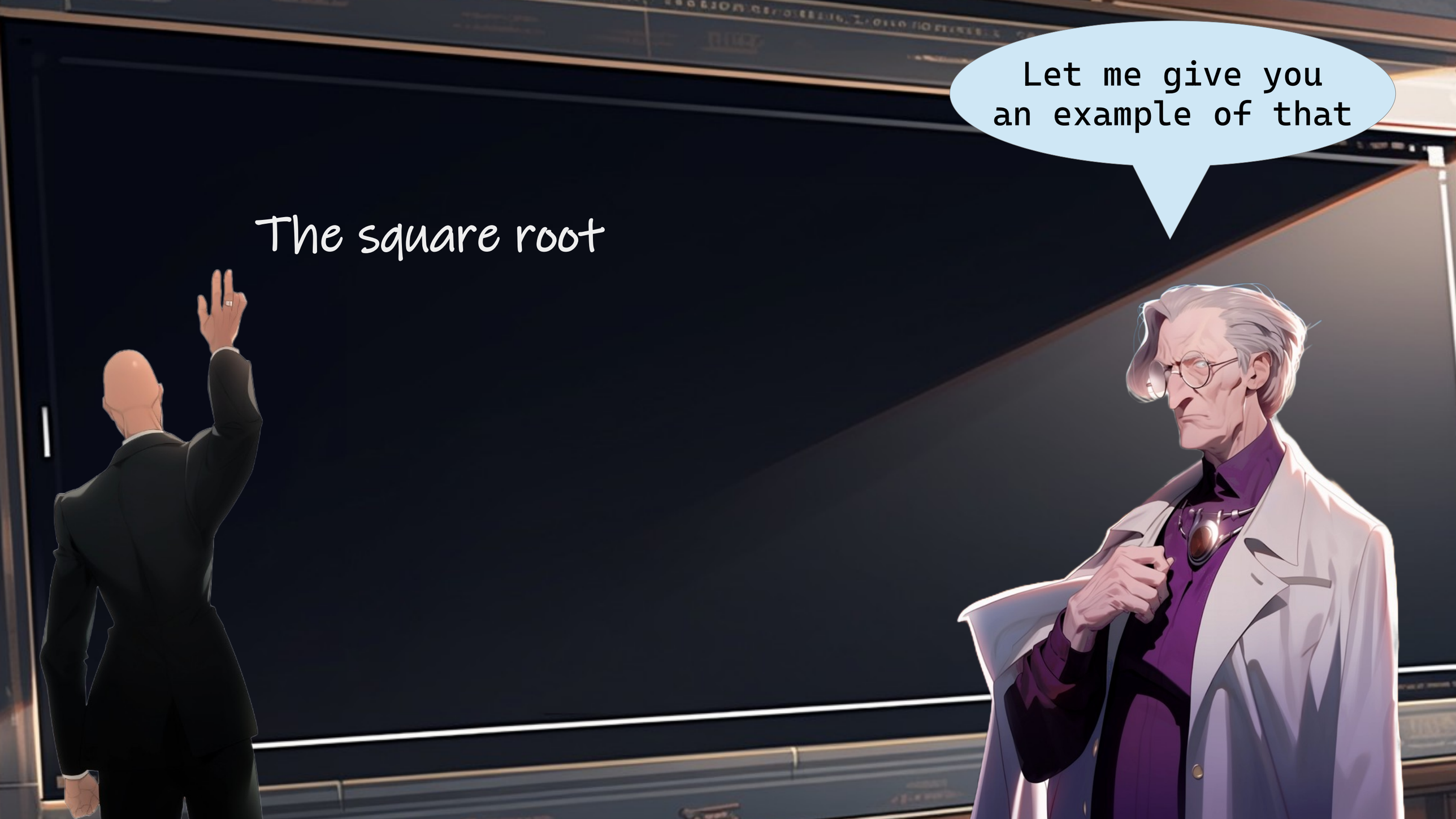

Similarly, future people will look at you and say
Yes, those primitives were fiddling around with these gadgets called computers
~~Computer Science~~
but really they were starting to learn how to formalize intuitions about methodical processes
a way to talk precisely about ‘how-to’ knowledge, as opposed to geometry that talks about what is true

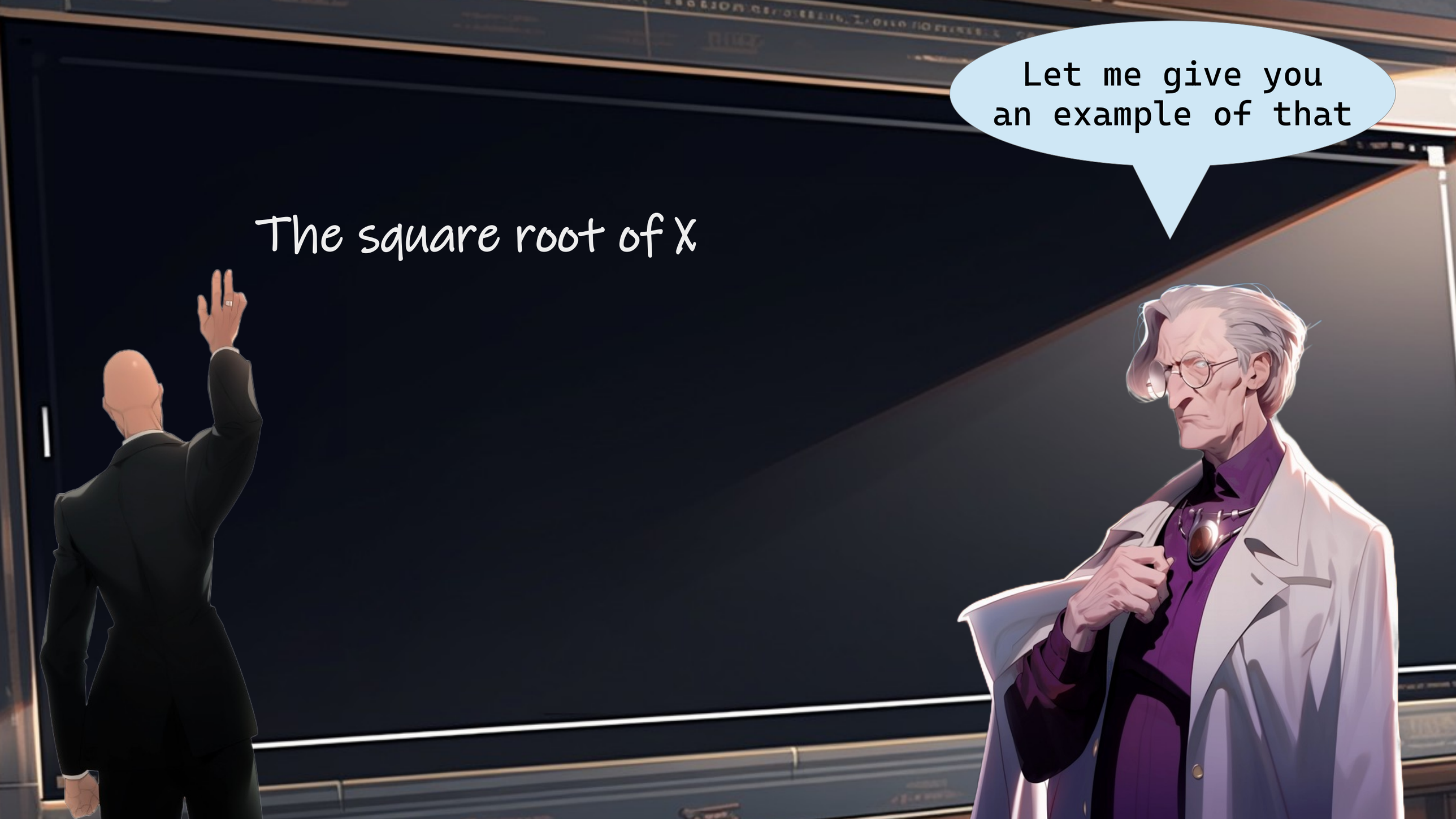
Let me give you
an example of that

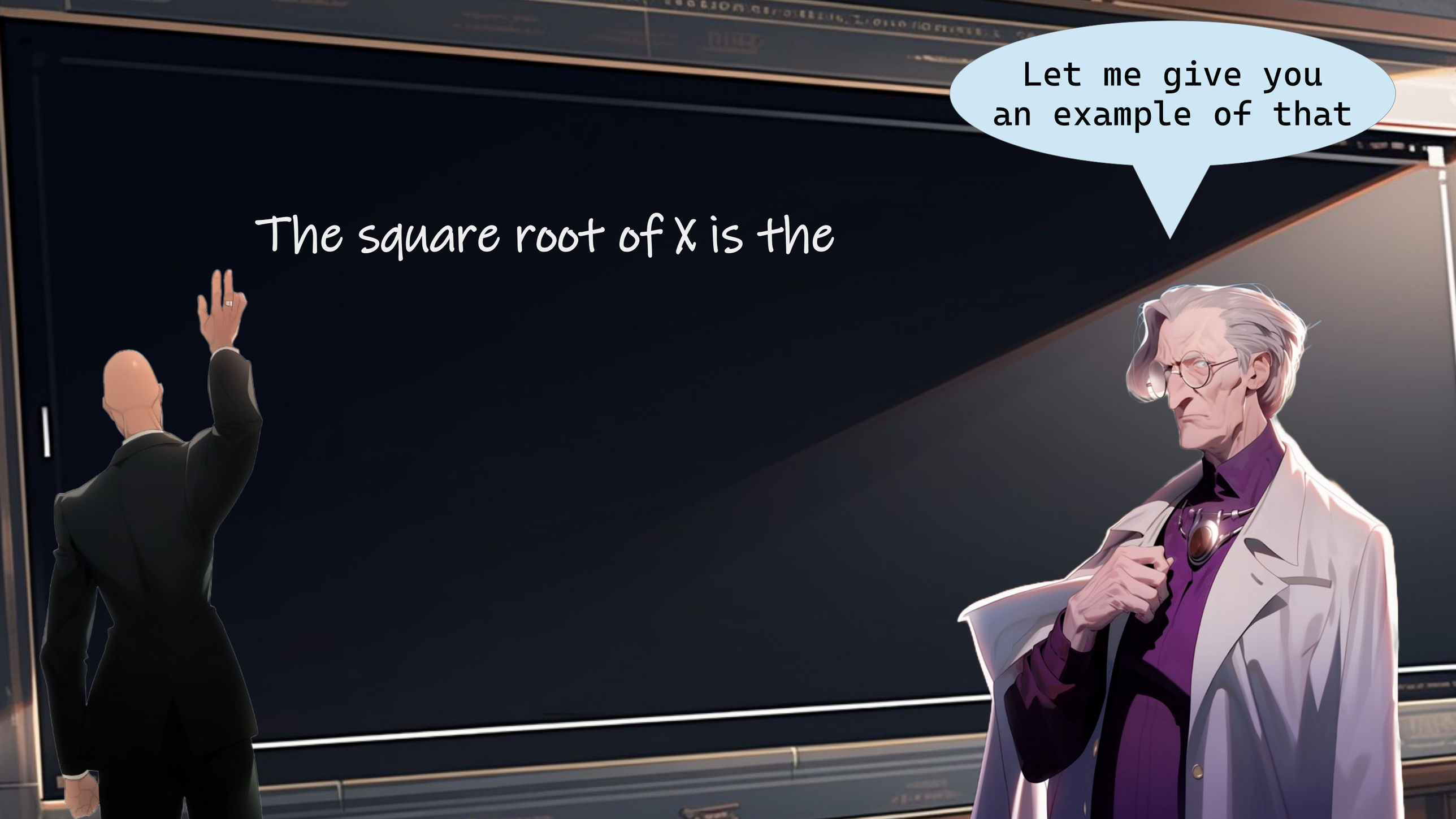
Let me give you
an example of that

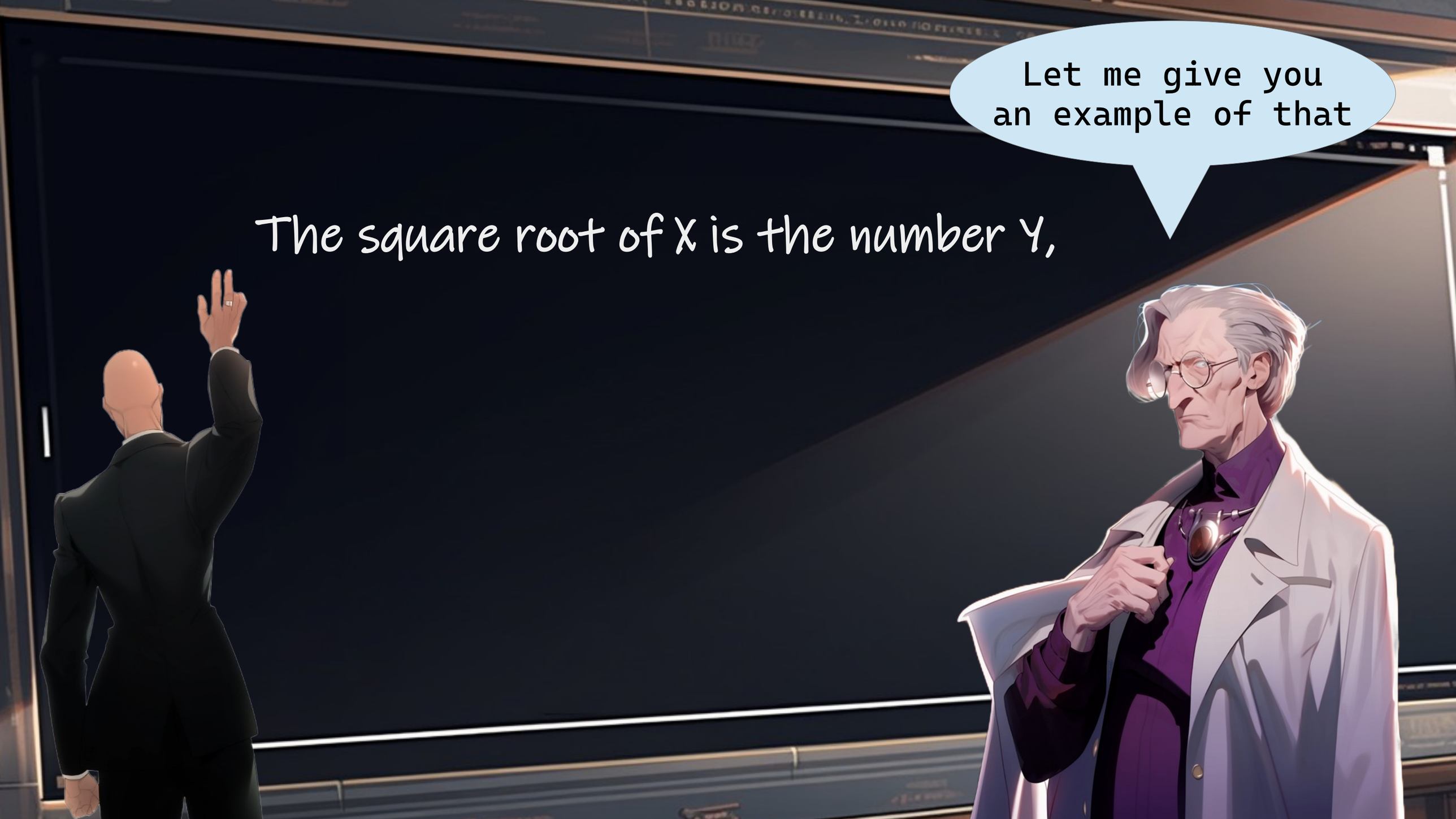
Let me give you an example of that
The

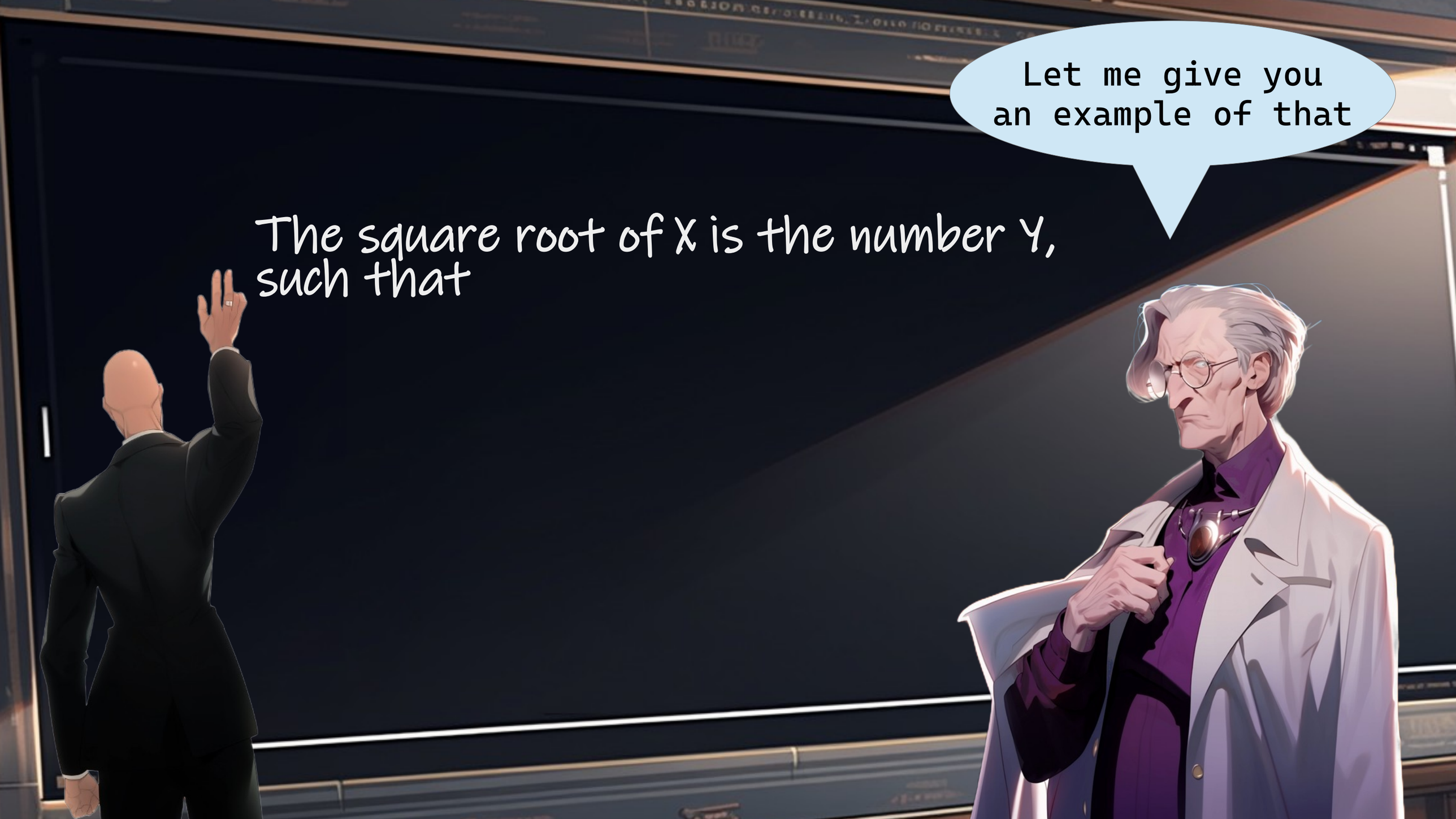

The square
Let me give you an example of that

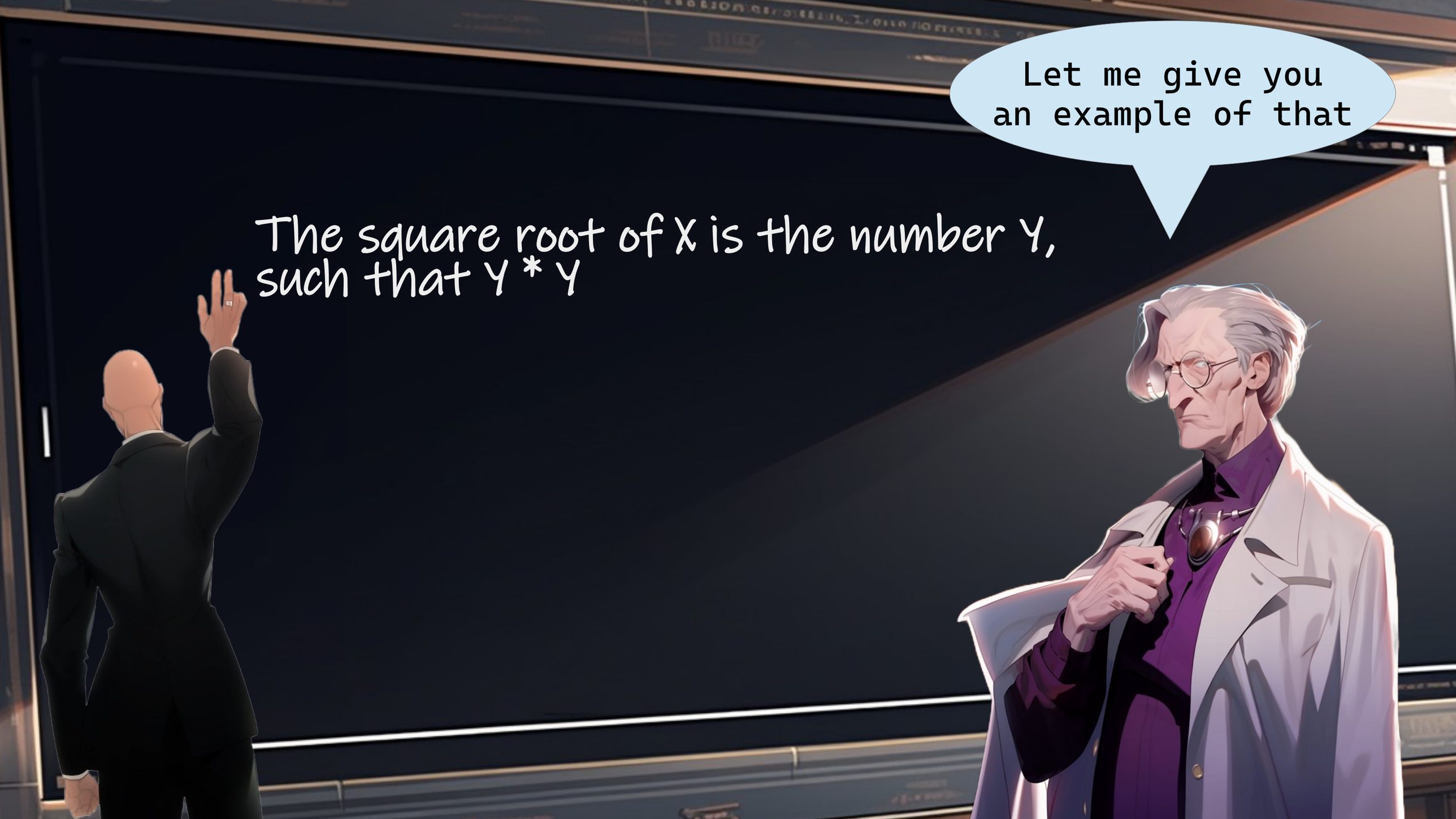

The square root
Let me give you an example of that

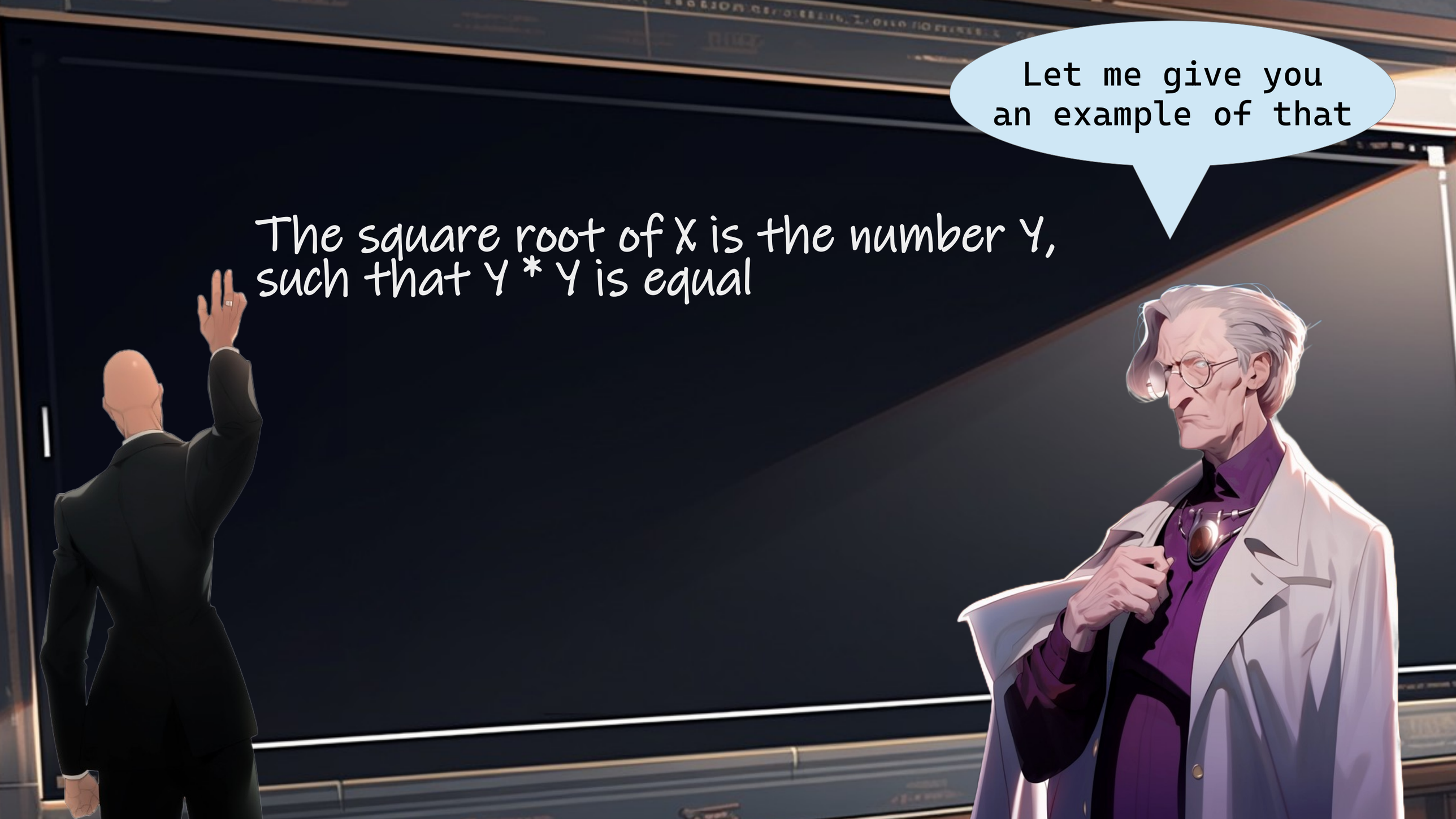

The square root of x
Let me give you an example of that

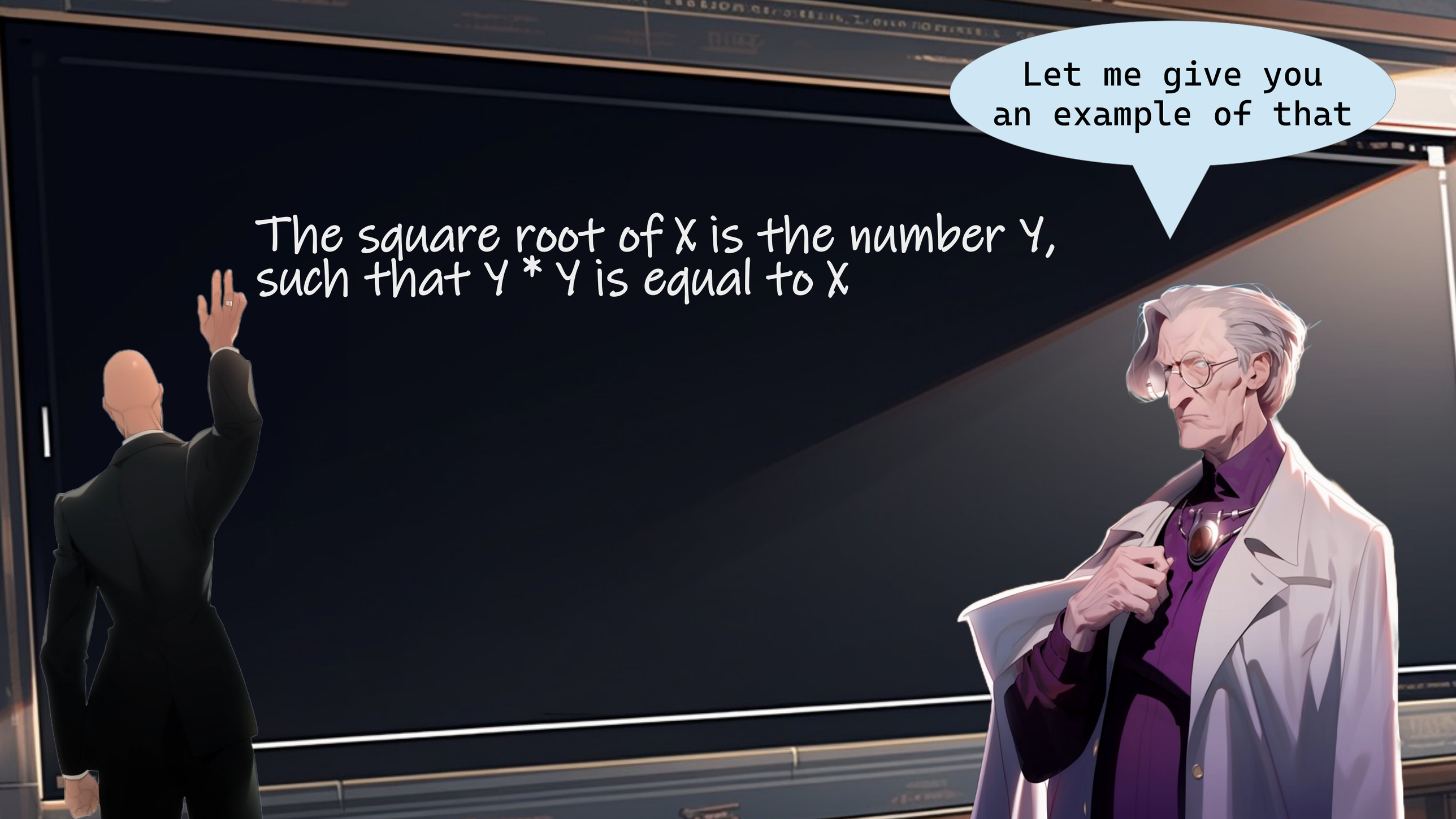

The square root of X is the
Let me give you an example of that

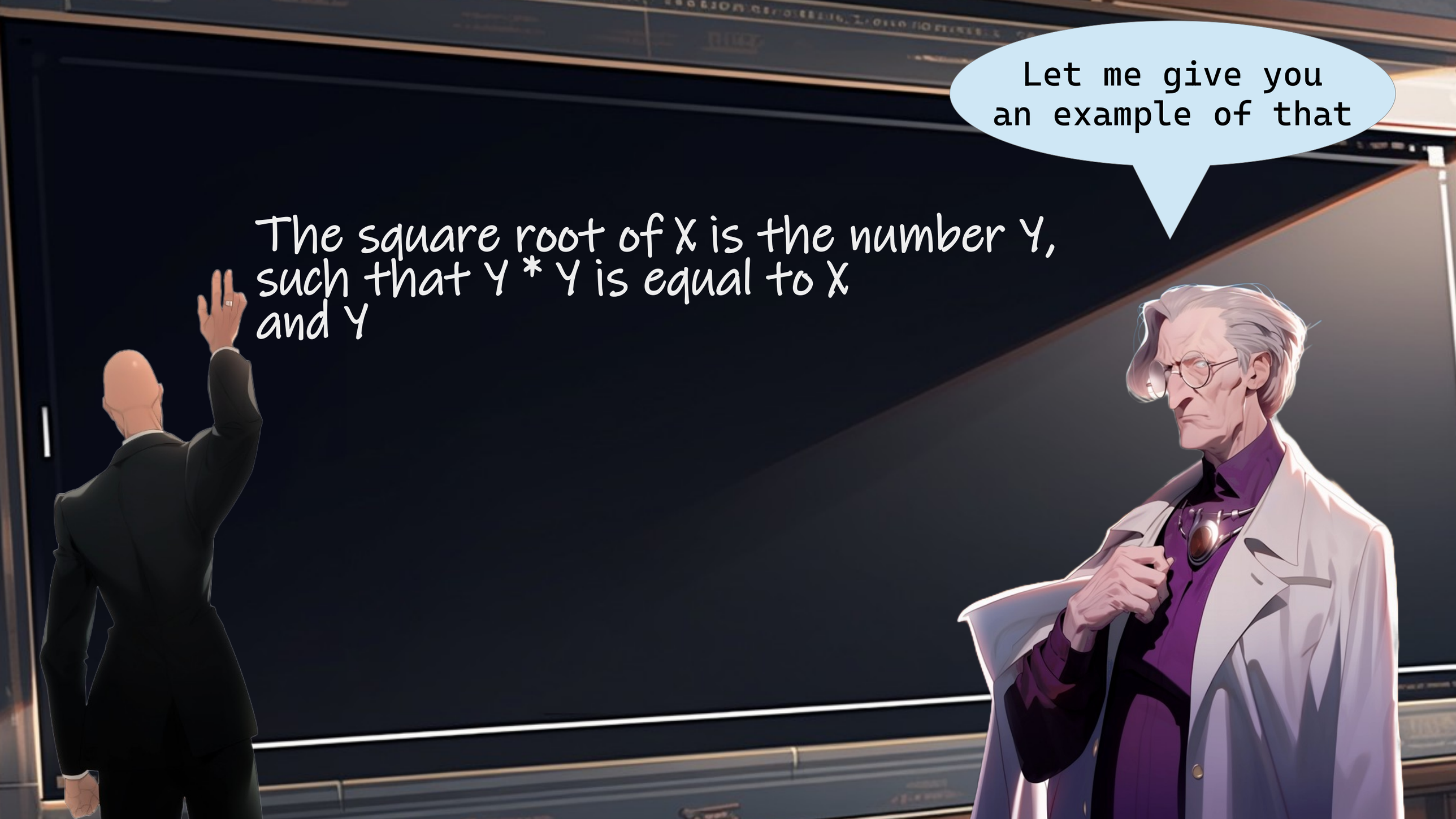

Let me give you an example of that
The square root of X is the number Y,

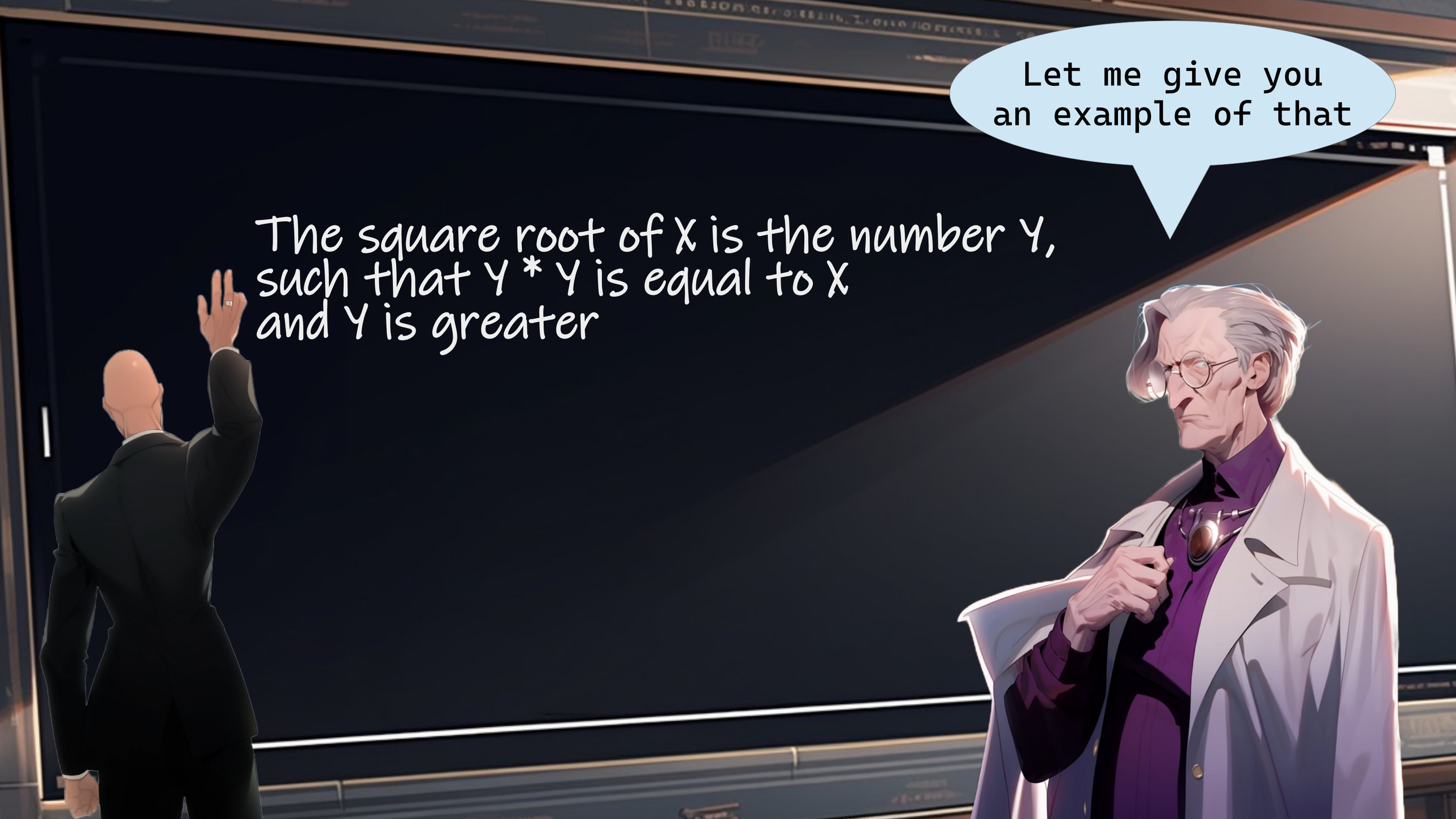

Let me give you an example of that
The square root of X is the number Y, such that

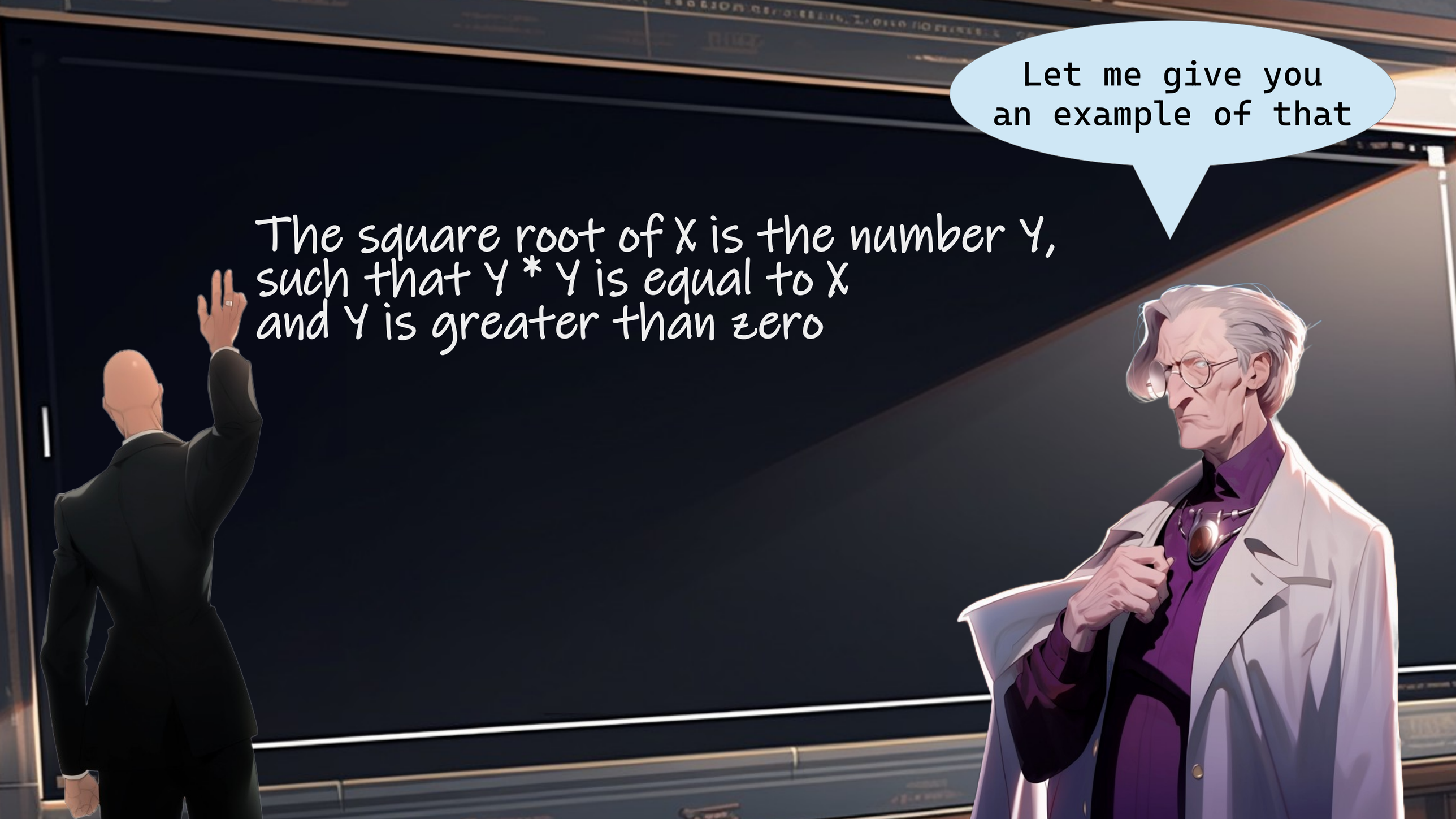

Let me give you an example of that
The square root of X is the number Y, such that Y * Y

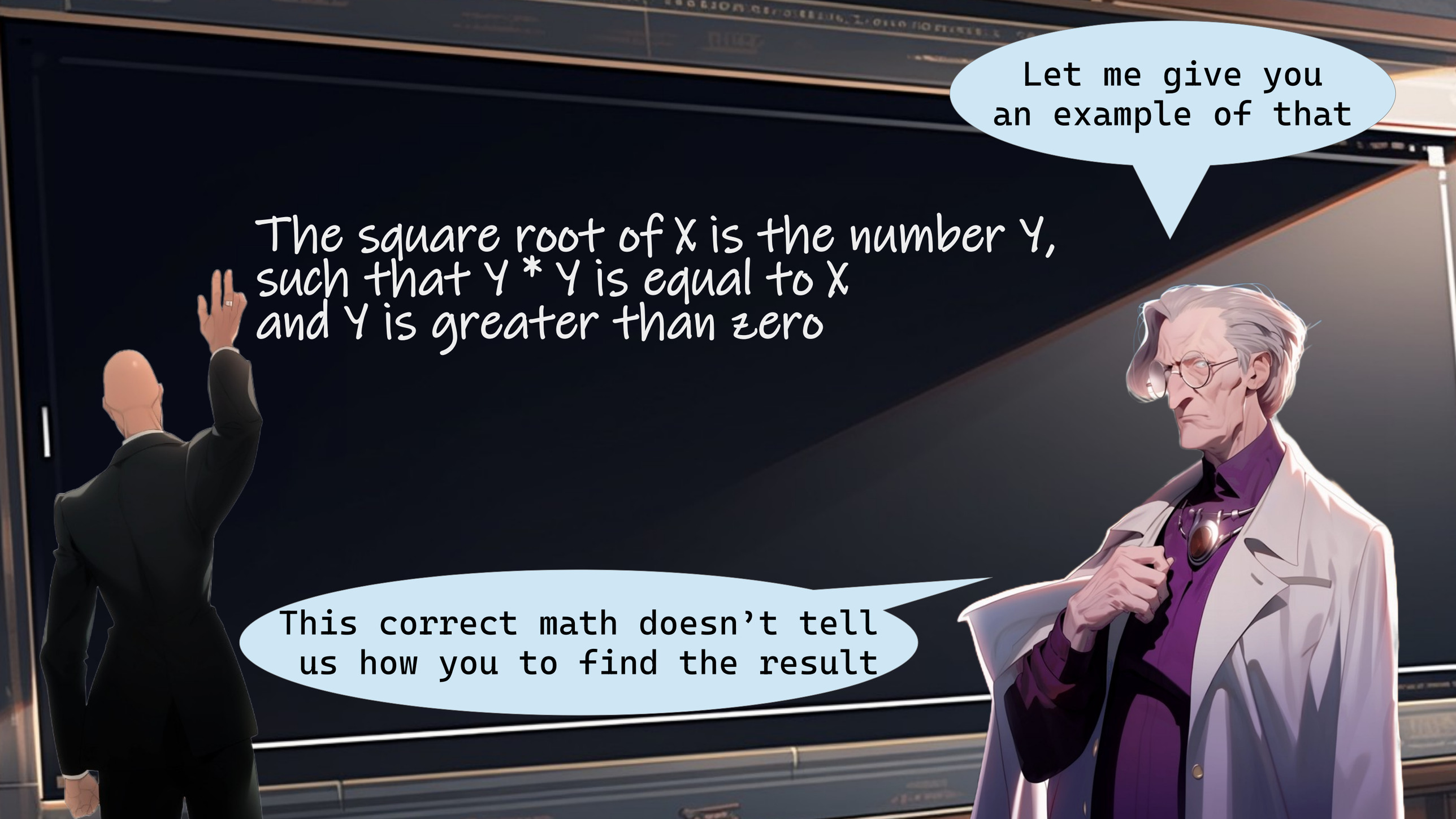

Let me give you an example of that
The square root of X is the number Y, such that Y * Y is equal

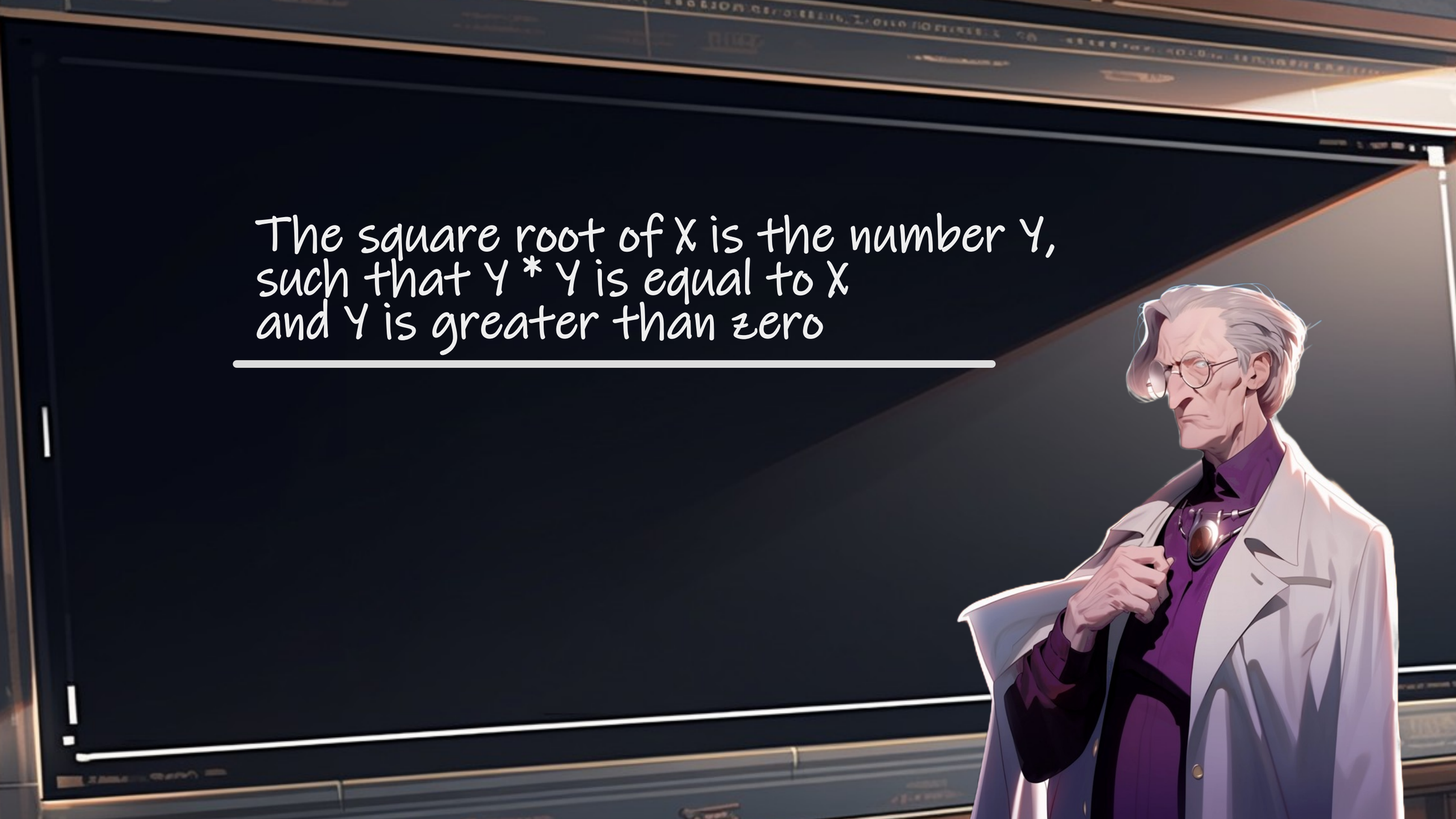

Let me give you an example of that
The square root of X is the number Y, such that Y * Y is equal to X


Let me give you an example of that
The square root of X is the number Y, such that Y * Y is equal to X and Y


Let me give you an example of that
The square root of X is the number Y, such that Y * Y is equal to X and Y is greater


Let me give you an example of that
The square root of X is the number Y, such that Y * Y is equal to X and Y is greater than zero


Let me give you an example of that
The square root of X is the number Y, such that Y * Y is equal to X and Y is greater than zero
This correct math doesn’t tell us how you to find the result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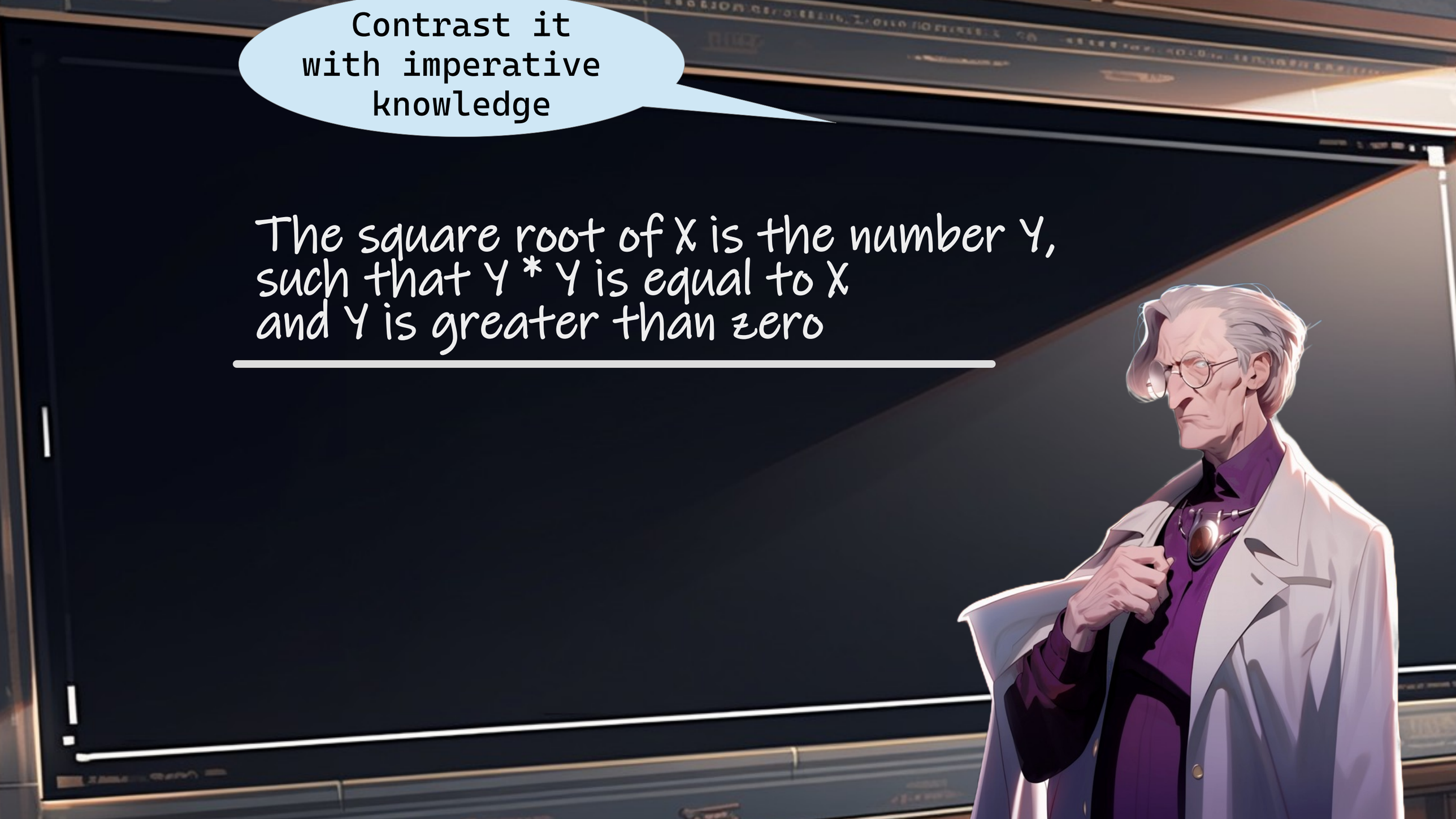
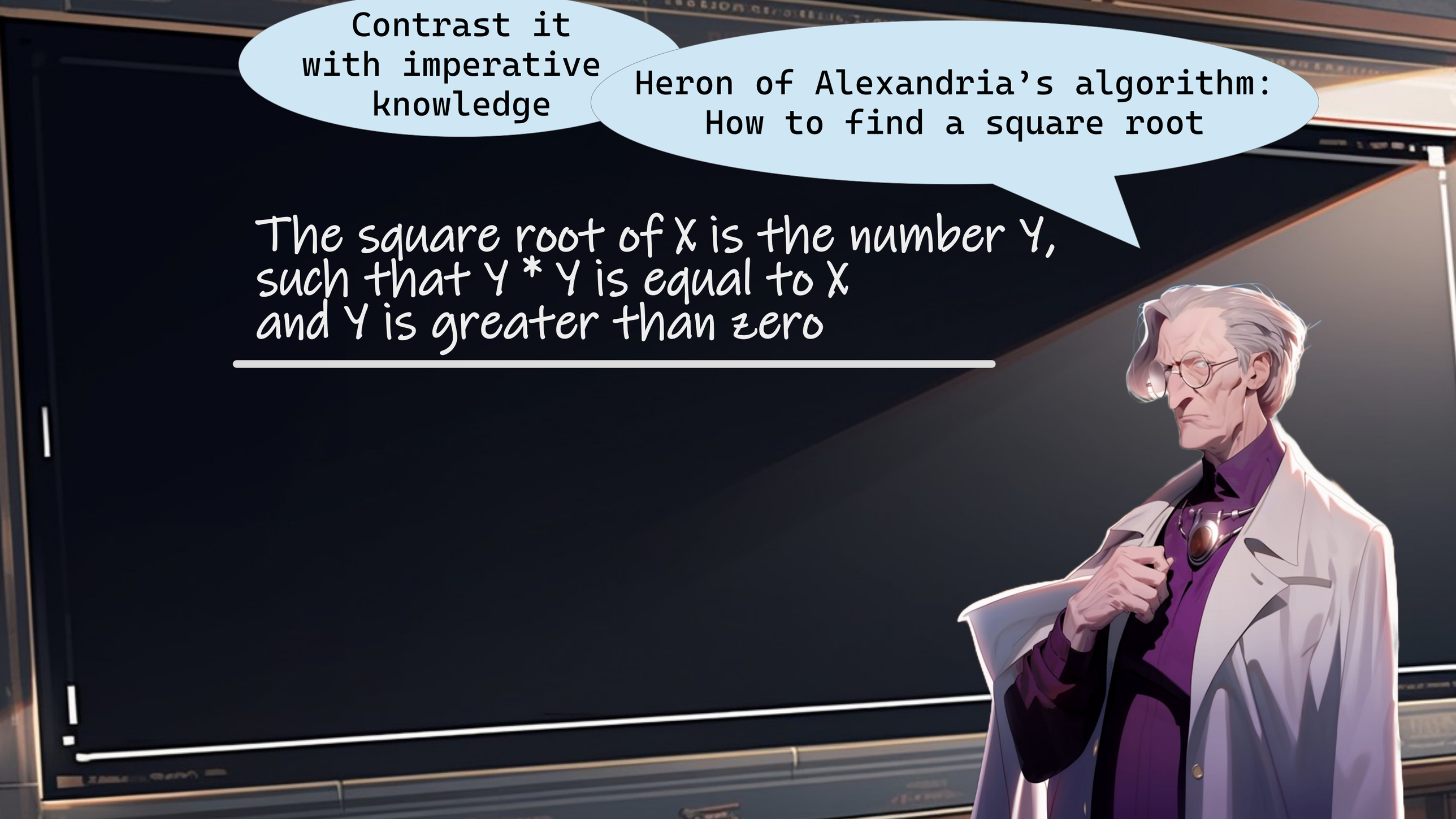
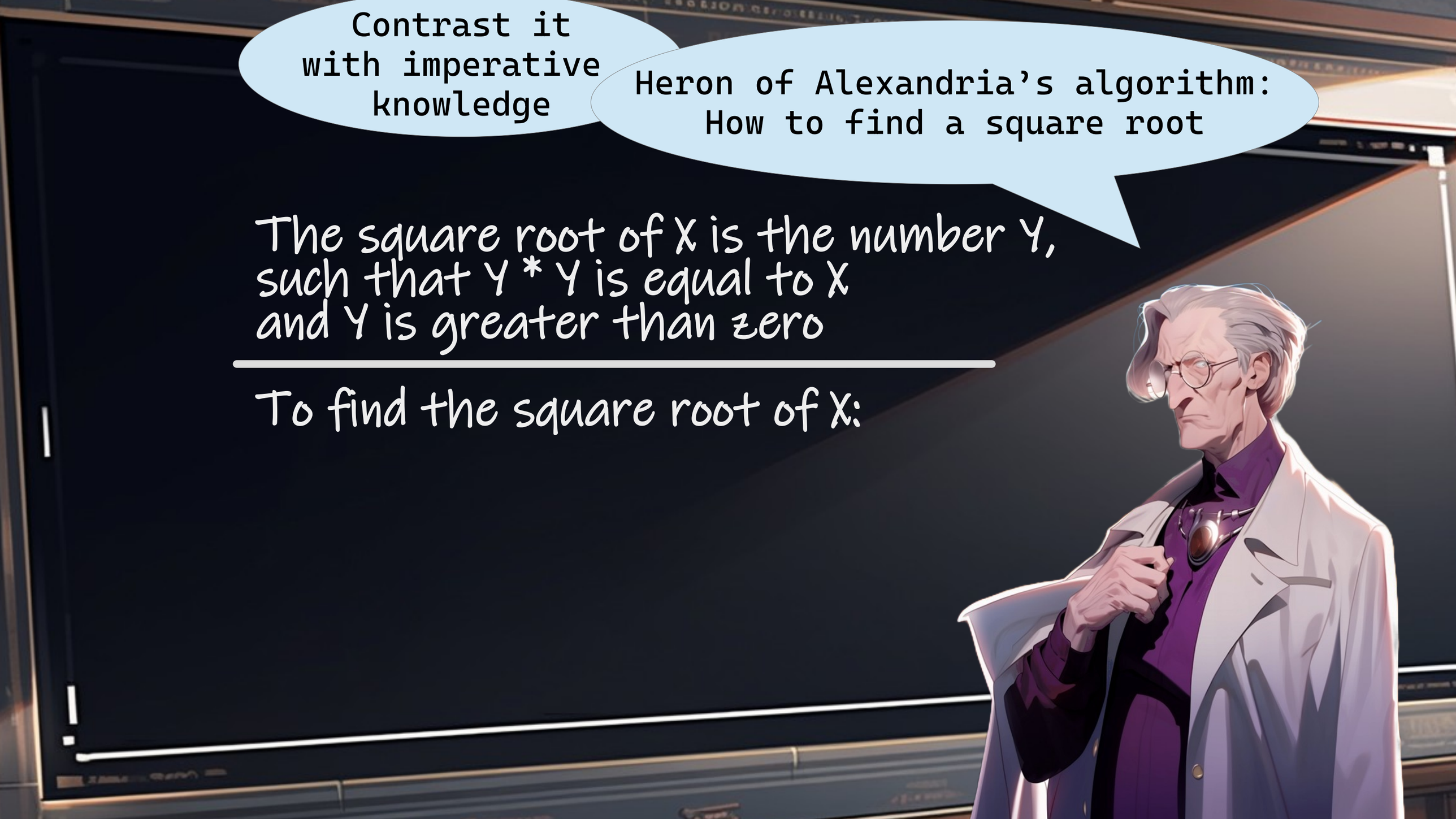

Contrast it with imperative knowledge
The square root of X is the number Y, such that Y * Y is equal to X and Y is greater than zero


Contrast it with imperative knowledge
Heron of Alexandria's algorithm: How to find a square root
The square root of X is the number Y, such that Y * Y is equal to X and Y is greater than zero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Heron of Alexandria's algorithm: How to find a square root
The square root of X is the number Y, such that Y * Y is equal to X and Y is greater than zero
To find the square root of X:

Contrast it with imperative knowledge

Heron of Alexandria's algorithm: How to find a square root

The square root of X is the number Y, such that Y * Y is equal to X and Y is greater than zero

---

To find the square root of X:
Make a guess,

Contrast it with imperative knowledge

Heron of Alexandria's algorithm: How to find a square root

The square root of X is the number Y,
such that Y * Y is equal to X
and Y is greater than zero

To find the square root of X:
Make a guess,
Improve it by averaging the guess

Contrast it with imperative knowledge

Heron of Alexandria's algorithm: How to find a square root

The square root of X is the number Y, such that Y * Y is equal to X and Y is greater than zero

---

To find the square root of X:
Make a guess,
Improve it by averaging the guess and X over the guess.

Contrast it with imperative knowledge

Heron of Alexandria's algorithm: How to find a square root

The square root of X is the number Y, such that Y * Y is equal to X and Y is greater than zero

---

To find the square root of X:
Make a guess,
Improve it by averaging the guess and X over the guess.
Keep improving the guess

Contrast it with imperative knowledge

Heron of Alexandria's algorithm: How to find a square root

The square root of X is the number Y, such that Y * Y is equal to X and Y is greater than zero

---

To find the square root of X:
Make a guess,
Improve it by averaging the guess and X over the guess.
Keep improving the guess until it's good enough

That's a method

That's a method
That's a process

That's a method
That's a process
This is what you will learn from now on

Riky and Dany chat after the first lecture

Riky and Dany chat after the first lecture

Riky and Dany chat after the first lecture
Hey Dany, are you ok?
Do I look ok to you?

Riky and Dany chat after the first lecture
Hey Dany, are you ok?
Do I look ok to you?
No, you look lost, that is why I'm asking

This lecture was relentless

This lecture was relentless
Every point made just seemed to be designed on purpose

This lecture was relentless
Every point made just seemed to be designed on purpose
to methodically tear down everything I thought I knew

This lecture was relentless
Every point made just seemed to be designed on purpose
to methodically tear down everything I thought I knew
We are going to fail this!

This university is absurd!

This university is absurd!
What’s up with that giant ivory tower?

This university is absurd!
What's up with that giant ivory tower?
I'm not sure, but it is very cool!

That is where the second year students live

That is where the second year students live
But do not worry about it

That is where the second year students live
But do not worry about it
Only a few manage to get there. And this is a good thing

This place is not good for you, leave while you can!

Poor guys,
they never listen
in time

Poor guys,
they never listen
in time

Aaah!

Aaah!
Whoops,
what was that!

What is going on?
I hate this place!

The next lecture is starting.
Maybe this is going to be easier!