Is Math a Language?

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"Math is a language", they said.

I hated hearing that

(largely because I hated math)

I didn’t see how or why “random letters” could be seen as a coherent language.

Math really is a language, however.

And so much more than a language

Math as a language

We can “translate” conventional languages into math

Put differently, we can transform words into equations.

Transforming Words into Equations

Consider this statement:

Your new salary is approximately 20% higher than your old salary

Transforming Words into Equations

Your new salary is approximately 20% higher than your old salary

$$\textit{New Salary} \approx \textit{Old Salary} + (20\% \times \textit{Old Salary})$$

Transforming Words into Equations

Writing long words can be painful at times.

$$\textit{New Salary} \approx \textit{Old Salary} + (20\% \times \textit{Old Salary})$$

Transforming Words into Equations

What if we shortened this into letters?

$$\textit{New Salary} \approx \textit{Old Salary} + (20\% \times \textit{Old Salary})$$

$$NS \approx OS + (20\% \times OS)$$

Transforming Words into Equations

Shorter tends to be better. But will we know what "NS" and "OS" are in a year's time?

Probably not. So it makes sense to annotate them.

Totally Random Equation

$$NS \approx OS + (20\% \times OS)$$

Where:

NS = *New Salary*

OS = *Old Salary*

Transforming Words into Equations

Now that we know we can annotate to remember, how about we “simplify” the look of the equation some more?

Transforming Words into Equations

Simplifying the look of the equation

$$\textit{New Salary} \approx \textit{Old Salary} + (20\% \times \textit{Old Salary})$$

$$NS \approx OS + (20\% \times OS)$$

$$s_N \approx s_O + (20\% \times s_O)$$

Shorter Random Equation

$$s_N \approx s_O + (20\% \times s_O)$$

Where:

s_N = *New Salary*

s_O = *Old Salary*

Transforming Words into Equations

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You can name equations however you like

*You're only limited by your imagination**

** (also by the consensus, and whether others will see your work, but that's it)*

Sam & John's Homes (Question)

Consider this statement:

Sam's house is worth twice as much as John's.

Transform the statement into an equation

Sam & John's Homes (Solution)

Sam's house is worth twice as much as John's.

(Or 2 times that of John's.)

$$\textit{Sam's House Value} = \textit{John's House Value} \times 2$$

Sam & John's Homes (Solution)

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Simplifying the look of the equation

Sam's House Value = *John's House Value* × 2

$$HV_S = HV_J \times 2$$

Sam & John's Homes (Solution)

$$HV_S = HV_J \times 2$$

Where:

HV_S = Sam's House Value

HV_J = John's House Value

Coca-Cola & Pepsi (Question)

Consider this statement:

Coca-Cola and Pepsi are not the same.

Transform the statement into an equation

Coca-Cola & Pepsi (Solution)

Coca-cola and Pepsi are not the same.

$$Coca\text{-}Cola \neq Pepsi$$

$$KO \neq PEP$$

A note on the choice of notations

Notice that "KO" is perhaps not the best annotation in that there's no "K" in Coca-Cola.

A note on the choice of notations

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"People in Finance" know that KO is Coca-Cola, however.

Because KO is Coca-Cola's symbol in financial markets. It's its "ticker".

A note on the choice of notations

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While you can theoretically name equations and the like however you wish, it helps to stick to the “general consensus” when you can.

A note on the choice of notations

Not sticking to the consensus is one of the reasons we often have many symbols for the same things in Finance / Accounting.

And this can (naturally) seem very confusing to beginners

Math as a language

Math is a language because words can be “translated” into equations.

And so can ideas and thoughts.

Math as a language

It’s a language because it works consistently, relying on a clear set of rules

Math as a language

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And anyone can use those rules to communicate things clearly and succinctly

Math as a language

It’s way easier to learn math than a “conventional language”

No nuances, misinterpretations of sarcasm, misunderstandings, etc to worry about!

Summary

Math can be seen as a language. It’s arguably easier to learn and use vis-a-vis “conventional” languages.

We can transform words into equations just by simplifying words into “easier to write” notations.

While we can theoretically name equations however we wish, it’s useful to stick to the general consensus when possible.

Now have a go at the quiz!