

Reading Questions

November 11, 2011

Read “Why Math Works” and answer the following questions. Do **not** quote him, but paraphrase what he says.

1 General Questions

1. According to Mario Livio, is math invented or discovered?
2. Why did Wigner say that mathematics was unreasonably effective?
3. Distinguish between passive and active effectiveness of mathematics.
4. Which mathematical theory is crucial to cryptography today?
5. Livio says that a jellyfish might never invent numbers. Specifically, he means the natural numbers like 1,2,3,4, etc. Why would this be the case?

2 Algebra 2/Pre-calculus-Only Questions

- When we say an equation like $x + 5 = y$ is still true if we change it to $x = y - 5$, would you say that this is a result of invented math or discovered math and why?

3 Calculus-Only Questions

Calculus has an interesting history. Two great mathematicians, Newton and Leibniz, came up with calculus independently. Unfortunately, neither of them knew of the other's works until much later, which sadly ended in a heated dispute as to who plagiarized whom.

I think reading Wikipedia's article on calculus and its history would greatly enhance your responses to the following questions, but it's not necessary.

- Was calculus invented or discovered (this answer depends on who you think came up with the idea)? Why?
- What applications are there in calculus and how do they relate to derivatives?