

Time to slit ... banana split that is, for now.

Unless you are up for reading more on the next page...

## **SEEING more than one way**

The thing that I like most about math is that it is a creativity endeavor.

Right away, I can see that some of you are already rolling your eyes big time. It is obvious you don't believe me.

So I'll ask you a question. What comes next in the sequence? 2 4 6 8 \_\_\_\_ ... I'd be willing to bet that your answer was 10. You would not be incorrect.

Since I was the one who authored this question, I'll tell you the answer that I was looking for was: "*Who do we appreciate?*"

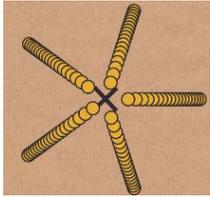
And it is **you** we should appreciate. More specifically, the process by how you reached your answer.

Math is so much more than the procedure or structure or algorithm with which we often associate it. It is of course, judged by the "correctness" of a solution. It is even more appropriate to judge a solution by its process.

This past week, I was blown away by a proof of the [Metallic Integral](#) by a Dr. Peyam. It had to do with something we call The Golden ratio. He generalized it so that my mind was able to see it in colors I had never seen it before. I got to see it in silver and bronze, TOOO!

Later in the day, (and I'm sure it was by a Google algorithm) I saw the most wonderful presentation on flowers and how they generate seeds. It happens that in order to be

most efficient at creating seeds, a flower does not push seeds out in a straight line but rotates from the center. If a flower turns, say, a quarter of a turn, then it would create spokes of four. Not very efficient.



If it turns a fifth of a turn, then it would ultimately create a five-spoke flower. A more efficient cycle, but not nearly the most efficient way for a flower to produce seeds.

A more efficient way is by following a rotation that produces the sequence, one, one, two, three, five ... in a growing spiral of turns about the center. Can you guess what number comes next? \_\_\_\_\_



If you conjectured 8 you are in good company. Known to Indian scholars as early as the 6th century, Leonardo Pisano also recognized this in an idealized description of growth in a population of rabbits around the year 1200. This rotational sequence is of a pattern such that the two previous terms' sum equals the third. In a generalized ratio of one number to the preceding number, it becomes  $\varphi = \frac{1+\sqrt{5}}{2}$  or the Golden Ratio!

As brilliant as we are, a flower that stands in the sun, entertains the bees and receives the rain, but very little formal education, has figured out this golden rule.

If we think a little about it, the human mind recognized an efficiency that nature as known for millennia. Dr. Peyam opened my eyes through the lens of integral calculus.

Three paths, one solution, and there so many more! Pretty creative, don't you think!

Happy Maths Good People!

*Peter*