Math and Books

G'Day!

This is your math friend James. Today I am answering a question from Anuragini.

CAN YOU CREATE SOME PUZZLES ABOUT BOOKS?

I think the answer is YES... at least, some puzzles about page numbers of pages in books and about text that is written on pages in books and maybe about how many pages a book has.

I started by searching on the internet for some basic facts about books — but it was hard to get clear and definitive answers. All I can say is that it wouldn't be unreasonable to say that a typical book an adult reads is about 400 pages long with 250 words per page. That makes for about 100,000 words in such a book!

The average word is either 4 or 5 letters long and the letter *e* is the most commonly used letter: it appears in text, on average, 11.2% of the time. Q and J are almost tied as the letter used least often, appearing in text only about 0.2% of the time each (Q just a smidgeon less often than J.)

puzzle #1

Ramin, reading a novel, suddenly exclaims, "Five pages have been torn out of my book!"

Upon hearing this, Liana responds, "I know that the sum of the page numbers missing is odd."

Having never touched Ramin's book, how does Liana know this?

The longest word I know with only one vowel is

STRENGTHS

(and that vowel is—lo and behold!—an *e*). **Can you think of a longer word with only one vowel?**

D w rlly nd vwls?
Cn y wrk t wht m wrtng hr?

Spps ppr nd nk wr vry xpnsve. Thn w mght cnsdr nvr wrtng vwls. Ths wld sv spce nd rdc nk cnsmptn.

Bt thn, wrtng n cmptr dsnt s ppr nd nk t ll! Tht wld b th mst snsbl sltn.

Here are two big words in English.

FACETIOUSLY   ABSTEMIOUSLY

They each use the five vowels and y, once in turn, and in alphabetical order.

Is there another English word with this property?

Something Curious

Twinkle twinkle little star
How I wonder what you are
Up above the world so high
Like a diamond in the sky
Twinkle twinkle little star
How I wonder what you are!

This famous nursery rhyme has an amazing mathematical property.

Choose any word in the first or second line. I'll choose "little".

Count how many letters are in that word and then move that many words forward in the rhyme to land on a new word.

"Little" has six letters, and counting six words forward lands me on "you" in the second line.

Count how many letters are in that new word and move that many words forward in the rhyme. Keep doing this until going further will have you go beyond the last line.

From "you" with three letters I next go to "above," and then (five words forward) to "like," and then (four words forward) to "the," and then (three words forward) to the second "twinkle," and then (six words forward) to "you," and then I need to stop.

Each time you try this you will land on the word "you" in the last line of the rhyme!

Try it. Start on "how" or "what" or "twinkle" or "I" or any word in the first two lines. You do land on "you" every single time!

Do you have a math question for me to answer, or try to answer?

Write to me <u>at the website</u>. Each week I'll pick a new question and give my thoughts on it!

puzzle #2

Find a novel and open it at a random page.

Choose any word in the first paragraph of that page and do the same "counting game" as for Twinkle Twinkle: count how many letters are in your chosen word, count that many words forward, and keep doing this until you are about to go off the page. Take note of the final word at the bottom of the page you land on.

Now choose a second starting word from the first paragraph and work your way down to the bottom of the page. Do it a again with a third starting word, and again with a fourth!

I bet you land on the same final word at the bottom of the page each time! Can you explain why?

Check out **<u>MATHICAL</u>** for award-winning math books for middle-schoolers and teens, the YouTube channel **<u>NUMBERPHILE</u>** for math videos galore, and **<u>MORE MATH!</u>** for even more resources. Wowza!

One of my favorite books of all time appears in Mathical's list <u>here</u>: The Phantom Tollbooth! I believe this book influenced me as a young lad to become a mathematician!

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