



# Math Mole

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Hot & Humid (even with the A/C on!)

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- Today's Editor: Nehal
- Next: Lily
- Later: Tyler, Neena, Michael

**Puzzle1:** This is Fibonacci's Famous Puzzle: A pair of rabbits less than one month in age, too young to produce more rabbits, is placed in a walled off area and well cared for. Suppose that in their second month and every subsequent month they produce a single new pair. If every pair behaves in the same way as the first pair, and none of the rabbits die, how many pairs of rabbits will there be for each of the first 13 months?

### Puzzle2:

Four men sat down to play,  
They played all night 'till break of day.  
They played for gold and not for fun  
With separate scores for everyone.  
When they came to square accounts,  
They all had made quite fair amounts.

Can you the paradox explain,

If no one lost, how could all gain?

**Puzzle3:** Because cigars cannot be entirely smoked, a hobo who collects cigar butts can make a cigar to smoke out of every 5 butts that he finds. This week, he has collected 625 cigar butts. How many cigars will he be able to smoke?

## Mathematician of the Day



Leonardo Pisano Fibonacci, 1170-1250 (Italy)

- Italian mathematician, who compiled and supplemented the mathematical knowledge of classical, Arabic, and Indian cultures, and who made contributions to the mathematical fields of algebra and number theory.
- Helped with understanding the Fibonacci series.
- The Fibonacci numbers are found to have many relationships to the Golden Ratio  $\phi = (1 + \sqrt{5})/2$ , a constant of nature and a value which fascinated the ancient Greeks, appearing throughout Greek art and architecture. One can verify with a hand calculator that the ratio of  $F_{n+1}$  to  $F_n$  is approximated by 1.6180339..., which is the decimal equivalent of the Golden Ratio.
- Fibonacci was widely revered by contemporaries in his field, and rose in prestige through the recognition and endorsement offered by Frederick II - the Holy Roman Emperor from 1220. Fibonacci had close links with Frederick's court scholars, particularly Johannes of Palermo who would present him with problem challenges. The solutions to these were sent to the Emperor, and in 1225 he met with Fibonacci when the court convened in Pisa.
- His book on how to do arithmetic in the decimal system, called *Liber abaci* (meaning *Book of the Abacus* or *Book of Calculating*) completed in 1202 persuaded many European mathematicians of his day to use this "new" system.

# Notes

## Outline

Graph Theory

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Homework: Prep for exam: Know your definitions!