



Math Mole

June 15, 2005

At 4:30, We're Halfway Home!

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This issue

- Mathematician of the Day
- Puzzles
- Class Outline
- Today's Editor: Elizabeth
- Next: Weier

Puzzle1: You've just moved into a new house, and know that one of the three switches on the panel by the front door turns on the light in the loft, but which switch? You don't want to keep climbing the four flights of stairs to the loft, so how can you work out which switch turns on that light while only making one visit to the loft?

Puzzle2: A customer at a 7-11 store selected four items to buy, and was told that the cost was \$7.11. He was curious that the cost was the same as the store name, so he enquired as to how the figure was derived. The clerk said that he had simply multiplied the prices of the four individual items. The customer protested that the four prices should have been ADDED, not MULTIPLIED. The clerk said that that was OK with him, but, the result was still the same: exactly \$7.11. What were the four prices?

Mathematician of the Day



Pythagoras - 569 to 475 BC, Ionia

Pythagoras of Samos is often described as the first pure mathematician. He is an extremely important figure in the development of mathematics yet we know relatively little about his mathematical achievements. Unlike many later Greek mathematicians, where at least we have some of the books which they wrote, we have nothing of Pythagoras's writings. The society which he led, half religious and half scientific, followed a code of secrecy which certainly means that today Pythagoras is a mysterious figure.

Little is known of Pythagoras's childhood. All accounts of his physical appearance are likely to be fictitious except the description of a striking birthmark which Pythagoras had on his thigh. It is probable that he had two brothers although some sources say that he had three. Certainly he was well educated, learning to play the lyre, learning poetry and to recite Homer. There were, among his teachers, three philosophers who were to influence Pythagoras while he was a young man. One of the most important was Pherekydes who many describe as the teacher of Pythagoras.

Pythagoras founded a philosophical and religious school in Croton (now Crotona, on the east of the heel of southern Italy) that had many followers. Pythagoras was the head of the society with an inner circle of followers known as mathematikoi. The beliefs that Pythagoras held were:

1. that at its deepest level, reality is mathematical in nature,
2. that philosophy can be used for spiritual purification,
3. that the soul can rise to union with the divine,
4. that certain symbols have a mystical significance, and
5. that all brothers of the order should observe strict loyalty and secrecy.

List of theorems attributed to Pythagoras

- The sum of the angles of a triangle is equal to two right angles.
- The theorem of Pythagoras
- Constructing figures of a given area and geometrical algebra.
- The discovery of irrationals.
- The five regular solids. construct the first three but it is unlikely that he would have known how to construct the other two.
- In astronomy Pythagoras taught that the Earth was a sphere at the centre of the Universe. He also recognised that the orbit of the Moon was inclined to the equator of the Earth and he was one of the first to realise that Venus as an evening star was the same planet as Venus as a morning star.

Notes

Outline

Functions

- Review 1-1 and Onto
- Inverses
- Images and Inverse Images

Kalculus with Kate

Homework: Read 5.3, 5.4