

# The Math News

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This issue's quotation:

**Mathematics seems to endow one with something like a new sense.**

Charles Darwin, quoted in N. Rose (ed.) *Mathematical Maxims and Minims*, Raleigh NC: Rome Press Inc., 1988

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The USNA Mathematics Department offers courses covering all the subjects mentioned on the front of this newsletter.

The Shannon sampling theorem is discussed in **SM312** and **SM314**, two versions of Engineering Mathematics.

**SM261** and **SM461** are courses in linear algebra.

**SM212** and its math major version, **SM222**, introduce partial differential equations, which **SM315** covers in more detail.

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Prof. **Joyner** is offering SM486, Error-Correcting

Codes, next semester.

Profs. **Buchanan** and **McCoy** do research in partial differential equations and signal processing.

**Quick fact:** Pythagoras and his followers divided mathematics into four branches: geometry, astronomy, arithmetic, and music. In medieval universities, these subjects were called the *quadrivium*, and formed the upper division of the seven "liberal arts."

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**Quick problem:** Can you find two odd numbers such that the sum of their squares is a perfect square?

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**Last issue's problem:** If three circles of radius 1 are all tangent to one another, there's room in the middle for a smaller circle tangent to all three. What's its radius?

The line segments connecting the centers of two of the large circles and the small circle form a 30-30-120 triangle. Bisecting the 120 degree angle gives a 30-60-90 triangle with hypotenuse  $1 + r$ , where  $r$  is the unknown radius, and longest leg 1. Easy trigonometry then shows  $r = 2/\sqrt{3} - 1$ .

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