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'Simpsons' analysts show how math figures into episodes

■ Professors use popular cartoon to demonstrate that subject doesn't have to be intimidating.

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CLAREMONT -- Mathematics doesn't exactly have a great reputation for being a source of brilliant humor. When was the last time you heard a math joke? And, more importantly, did you laugh?

That's why it may come as a surprise that the writers of "The Simpsons," regarded by some critics as the smartest, most successful cartoon on television today, regularly turn to math to plumb its potential for amusement.

Take, for example, one 1998 episode in which Homer contemplates buying a 5-pound lobster at $8 per pound. "How many pounds in a gallon?" he wonders.

The show's preoccupation with innumeracy -- the mathematical equivalent of illiteracy -- and with math in general has not gone unnoticed in academic circles.

Two math professors, Andrew Nestler of Santa Monica College and Sarah J. Greenwald of Appalachian State University in North Carolina, have compiled more than 100 math references, from the simple to the cutting edge, in the show's 13-season run.

The pair recently gave a lecture at Harvey Mudd College to an audience of more than 100 students that sampled mathematical morsels from the show.

"It's a show with a cult following, especially at Harvey Mudd," said Harvey Mudd physics sophomore Sean Skelley, explaining the lecture's popularity. "There are a lot of mature references and subtle jokes that may fly past children, but adults can get the subtle meanings."

Harvey Mudd regularly has math lectures that may appeal to a a broader nonacademic audience, math department chairman Michael Moody said.

"The Simpsons" uses fractions, statistics, geometry and the metric system to show that many of the characters have an apparent lack of math knowledge.

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For example, the show's resident school bully, Nelson Muntz, once declared "That's like asking the square root of a million. No one will ever know."

Actually, there are two numbers that when squared equal 1 million: 1,000 and -1,000. Nelson's quip got a big guffaw from the science and math students at Harvey Mudd.

Nestler and Greenwald, who are huge fans of the show, began the idea of using "The Simpsons" in lectures a few years ago while they were graduate students at the University of Pennsylvania.

They wanted a way to get students who are uncomfortable or even afraid of math to see that the subject shouldn't be too intimidating and can even be fun, Greenwald said.

They have given their lecture four times, mostly recently on Saturday at CalTech for the spring meeting of the Southern California Mathematical Assn. of America.

At Harvey Mudd, Nestler said it was like preaching to the converted, as a solid background in math is required to gain admission to the science and engineering school.

In Greenwald's favorite "Simpsons" math moment, Homer and Marge Simpson are considering sending their daughter Lisa to a school for the gifted.

As the camera pans, two young girls playing the game of patty-cake recite the following playground chant: "Cross my heart and hope to die / Here's the digits that make pi / 3.1415926535897932384..." and the camera pans away.

The joke, of course, is that the digits that make pi -- a circle's circumference divided by its diameter -- continue infinitely. The writers are clearly aware that pi is what's called an irrational number -- one that cannot be expressed in terms of the quotient of two integers in lowest terms. And to "get it," the viewers have to understand that it means you can never say what pi is exactly, in the same way you can say what 5 is.

"They laugh, but then they start to ask questions and engage the mathematics," Greenwald said of the audiences to which she shows the clip. "They end up learning significant mathematics, because there are deep ideas embedded in these."

Nestler and Greenwald said some of the math references show a surprisingly high level of understanding of complex math topics.

In one episode, Homer Simpson, normally a two-dimensional character, is trapped in a three-dimensional world.

One equation whizzes by the screen: $1{,}782^{12} + 1841^{12} = 1922^{12}$.

One could multiply out the numbers raised to the power of 12 to prove that the statement is false -- a tedious process by any measure -- but it's not really necessary since the equation would, if true, prove Fermat's Last Theorem false.

Fermat's Last Theorem, which for centuries stumped the best mathematical minds but has now been proved, states that when "n" is greater than 2, there

are no non-zero integers that can stand in for X,Y, and Z in the equation $X^n + Y^n = Z^n$ that will make the equation true. Since 12 is greater than 2, the statement that whizzed by the 3-D Homer is obviously false.

Such an arcane math reference would be lost on most, but a few of the more well-read Mudders caught the inside joke.

For more a more complete guide to math references in "The Simpsons," check out the Web site: *http://homepage.smc.edu/nestler_andrew/ SimpsonsMath.htm.*

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