Problem of the Week
Number Ten
April 11, 2016

Well folks, we have reached the end of the semester. So let's go out in style!

What do you get when you cross an elephant with a zebra? The magnitude of the elephant times the magnitude of the zebra times the sine of the angle between them.

What do you get when you cross a mosquito with a mountain climber? Nothing, because you cannot cross a vector with a scalar.

I put my root beer in a square glass. Now it's just beer.

A scientist goes into a pharmacy and asks for acetylsalicylic acid. "Do you mean aspirin?" asks the pharmacist. The scientist slaps his forehead. "That's it!" he says. "I can never remember the name."

Did you hear about the mathematician who suffered from xenophobia? He had an irrational fear of convergent sequences.

The highest moments in the life of a mathematician are the first few moments after one has proved the result, but before one finds the mistake.

A statistician can have his head in an oven and his feet in ice, and he will say that on average he feels fine.

What's a proof? It's one-half percent of alcohol.

How many light bulbs does it take to change a light bulb? One, but only if it knows its own Gödel number.

A mathematician confided
That the Möbius band is one-sided
And you'll get quite a laugh
If you cut one in half
'Cause it stays in one piece when divided.

A challenge for many long ages
Had baffled the savants and sages
Yet at last came the light
Seems old Fermat was right
To the margin add 200 pages.

If $(1 + x)$ (real close to 1)
Is raised to the power of 1
Over x, you will find
Here's the value defined:
2.718281.

A dozen, a gross and a score
Plus three times the square root of four
Divided by seven
Plus five time eleven
Equals nine squared and not a bit more.

(If you care to check, this one says, $\frac{12+144+20+(3\sqrt{4})}{7} + (5)(11) = 9^2$.)

Integral z-squared dz
From 1 to the cube root of three
Times the cosine
Of three pi over 9
Equals log of the cube root of e.

(And this one says

$$\left(\int_1^{\sqrt[3]{3}} z^2\, dz\right)\left(\cos\frac{3\pi}{9}\right) = \ln\sqrt[3]{e}.)$$

A sheepdog gets all the sheep in a pen. "All 40 accounted for," he says to the farmer. The farmer replies, "But I only have 36 sheep." "I know," says the dog. "But I rounded them up."

"Do you love your math more than me?" "Of course not, dear, I love you much more." "Then prove it!" "Well, let me see. Let R be the set of all lovable objects . . . ."

A physicist has been conducting experiments and has worked out a set of equations which explain the data. He asks a mathematician to check them. A week later the mathematician calls and declares them to be complete nonsense. The physicist replies, "But the equations accurately predict the results of experiments. Are you sure they are completely wrong?" "To be precise," the mathematician says, "they are not always complete nonsense. But they only work in the trivial case of an Archimedean field."

Naoh's Ark lands after The Flood, and Noah releases the animals. "Go forth and multiply," he tells them. Months pass, and Noah checks up on them. All are doing fine except a pair of snakes. "What's the problem?" he asks. "Cut down some trees and let us live there," reply the snakes. Noah does so and comes back a few weeks later. He sees lots of little snakes. Noah asks, "How did the trees help?" The snakes reply, "We're adders, and we need logs to multiply."

One day, Jesus said to his disciples, "The Kingdom of Heaven is like $3x^2 + 8x - 9$. St. Thomas looked confused and asked St. Peter what it meant. St. Peter replied, "Don't worry, it's just another one of his parabolas."

A physicist and an engineer are in a hot-air balloon. Soon they find themselves lost in a canyon somewhere. They yell out for help. "Hellllooooooo! Where are we?" A few minutes later they hear an echoing voice. "You're in a hot-air balloon!" The physicist says, "That must have been a mathematician." "Why do you say that?" the engineer replies. "Because," said the physicist, "the answer was absolutely correct, but utterly useless.

A farmer asked an engineer, a physicist, and a mathematician to fence in the largest area with the least amount of fence. The engineer made the fence into a circle and declared it to be the best design. The physicist formed the fence into a straight and said, "We can assume the length is infinite, and that allows us to fence off half the Earth." The mathematician laughed at both, built a tiny fence around himself, and said, "I declare myself to be on the outside."

SEE YOU NEXT YEAR!

Here's this week's problem:

What is the largest positive integer n for which $n^3 + 100$ is divisible by $n + 10$?

When you think you have the problem figured out, follow the following instructions.

Submissions are due to Jason Rosenhouse by 5:00 on ***Friday, April 15.*** *Solutions should be written on the back of an official POTW handout. Place your name, e-mail address, and the section numbers and professors of any math courses you are taking, in the* ***upper right corner*** *of the front of the page. One weekly winner will receive a five-dollar gift card from Starbucks. Solutions will be posted at this website, by the Monday after the problem is due:*

http://educ.jmu.edu/∼rosenhjd/POTW/Spring15.html