Problem of the Week

Number Nine

April 1, 2013

I always like a good counterintuitive problem. Tell people that $.99999... = 1$, and not only will they not believer it, they will get downright snippy with you. Likewise if you tell them they will double their chances of winning by switching doors in the Monty Hall problem. (If you don't know the Monty Hall problem, then I know a good book you can read!) Or what about this: Would you rather be paid $\$4000$ for your first year of work, with a raise of $\$800$ for each year thereafter, or $\$2000$ for your first six months of work with a raise of $\$200$ every six months thereafter? Let me suggest that you check your initial, gut reaction against some actual calculations.

But that's not the problem of the week. This is:

Suppose a steel beam, one mile long, is fastened securely to the ground at each end. As the day heats up, the metal expands. Let us assume that at the hottest part of the day, the metal is actually one mile and one foot long. Let us further assume that the beam is fastened in such a way that it can only buckle upward, and not side to side. Your problem is to estimate how high the beam will be above the ground. Would you be able to slip a playing card under it? A pencil? Would you be able to crawl under it? Walk under it? Could an elephant (roughly 13 ft tall) walk under it? How about a person standing on the back of an elephant? That sort of thing. Be sure to justify your answer!

Solutions are due to Jason Rosenhouse by 5:00 on Friday, April 5. One weekly winner will receive a five-dollar gift card from Starbucks. Winners will be drawn randomly from among the correct answers. The solution will be posted at the POTW website:

http://educ.jmu.edu/rosenhjd/POTW/Spring13/spring13.html