

name: _____ e-mail: _____

check if faculty: _____ class and professor: _____

The problems of the week are available online at
<http://www.math.jmu.edu/~rosenhjd/potw.html>.

Problem of the Week Three

You would think that after the learned correspondence between Pascal and Fermat mathematicians would rush in to explore the fertile new territory of probability theory. Alas, this turned out not to be the case. Isaac Todhunter, in his magisterial and still authoritative 1865 book *A History of the Mathematical Theory of Probability From the Time of Pascal to That of Laplace*, aptly describes the sorry reality of that time:

It might have been anticipated that a subject interesting in itself and discussed by the two most distinguished mathematicians of the time would have attracted rapid and general attention; but such does not appear to have been the case ... The invention of the Differential Calculus by Newton and Leibnitz soon offered to mathematicians a subject of absorbing interest; and we shall find that the Theory of Probability advanced but little during the half century which followed the date of the correspondence between Pascal and Fermat.

A notable exception to this gloomy picture is provided by the Dutch mathematician and physicist Christiaan Huygens, whose 1657 volume *Of the Laws of Chance* is generally considered to be the first book on probability theory ever published. Huygens discusses some familiar chestnuts involving dice and coins, but also advances the subject by introducing what we would now call the expected value of a random variable. He closed his brief essay with five amusing problems for the reader. This week's problem is a variation on one of them:

Imagine that we have forty cards consisting of the Ace through Ten of each suit. These cards are thoroughly shuffled and four cards are then selected at random. What is the probability of selecting one card from each suit?

For ease of grading, please write your answer in the form of a simple fraction (that is, one integer over another). Solutions are due **Wednesday, February 13** by 5:00 to Jason Rosenhouse in Roop 121. One weekly winner will receive a five dollar gift card to Greenberry's, and will be chosen randomly from among the correct answers. As always, please give a line or two of explanation to accompany your answer.