

MSCS



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This Week's Colloquium and Tailgate Extravaganza

Title:	Clutch Hitting in Baseball: Myth or Reality?
Speakers:	Matt Richey and Paul Roback, St. Olaf College
Time:	Tuesday, October 11: 5:45 - Tailgate party in SC foyer with brats, beans, chips, etc. 6:30 - The Main Event 7:30 - Supreme Sundae Dessert Celebration
Place:	SC Lobby and SC 282

The baseball playoffs have begun and, as usual, commentators are talking about "clutch" performances. Clutch hitting is part of the lore of the post season. In the 1970's, Reggie Jackson earned the nickname "Mr. October" for his clutch hitting feats during the playoffs and World Series. Recently, some baseball "experts" have been claiming that David Ortiz of the Boston Red Sox is the best clutch hitter of our generation, if not for all time. However, other "experts" say that there is no statistical evidence that clutch hitting even exists. Who is right?

In this talk, we will examine how one might use insights and techniques from mathematics and statistics to address the clutch hitting controversy. We will present results from the

2005 season that may both intrigue and surprise you. This talk assumes no deep knowledge of baseball, mathematics, or statistics. However, we do require an interest in eating brats and hearing about how mathematics and statistics can inform opinions on one of the crucial questions facing baseball fans today.

Problem of the Week (POW)

An airplane has exactly 80 passenger seats. Eighty passengers are in a single line to get on board, and each has a reserved assigned seat. Each passenger gets on one at a time to select his or her seat. However, the first passenger does not look at the assigned seat number and randomly selects a seat on the plane. Thereafter, each passenger takes his or her assigned seat; if the seat is already taken, the passenger selects another unoccupied seat at random. What is the probability that the last passenger on board will be able to sit in his/her originally assigned seat?

*** Please submit all solutions by Wednesday at noon to Amelia Taylor by e-mail (ataylor@stolaf.edu) or by placing them in her box at OMH 201.

Last Week's Problem

Let Q be a non-degenerate convex quadrilateral inscribed in a circle. Show that the four lines, each passing through the midpoint at a side of Q and perpendicular to the opposite side, meet in a point.

We approach this problem by putting the quadrilateral and circle in a coordinate system with the origin of the circle and getting equations for the lines. Let A, B, C, D be the vectors that describe the vertices (or corners) of the quadrilateral Q in the coordinate system. We can assume without loss of generality that the circle is the unit circle, so $|A| = |B| = |C| = |D| = 1$ and $(A - B) \cdot (A + B) = 0$ and similarly for each of the other pairs of vertices. Thus, the vector $A + B$ is perpendicular to the side AB of Q ; $B + C$ is perpendicular to BC ; etc. Also, a parametric equation of the line that passes through the midpoint of AB and is perpendicular to CD is

$$x(t) = t(C + D) + \frac{A + B}{2}, \quad -\infty < t < \infty$$

We can do the same for each pair of vertices, so the problem is now to find a simultaneous solution to the set of equations

$$x = t(C + D) + \frac{A + B}{2}$$

$$x = t(D + A) + \frac{B + C}{2}$$

$$x = t(A + B) + \frac{C + D}{2}$$

$$x = t(B + C) + \frac{D + A}{2}$$

Looking at the set of equations, if $t = \frac{1}{2}$ and

$x = \frac{1}{2}(A + B + C + D)$, we have a solution.

This solution is unique, since the first two lines

are not parallel and therefore meet in a unique common point.

Mathematical Moments: U b t jdg

It's no secret that mathematics is good for many things, but almost anyone will find some surprises at www.ams.org/mathmoments, where the American Mathematical Society collects brief, tantalizing, and colorful pointers to mathematical applications of stunning diversity. It is mathematics, for instance, that permits movies that require 10,000 feet of physical film to be fit on a DVD less than 5 inches in diameter. Linear algebra, probability, graph theory, and abstract algebra all play key roles in data compression. Does it really work? U b t jdg.

St. Olaf MAA Meeting

Whether you are a math major, taking a math class, or just have a mild interest in mathematics, you are invited to participate in St. Olaf's Math Association of America Club. Our first meeting will be Thursday, October 13 at 8:00 p.m. in SC 184. First on the agenda is this year's t-shirt design. If you haven't submitted your idea, please do so by putting it in Phil Schulte's PO box, emailing it to schulte@stolaf.edu, or just bringing it to the meeting. Remember, the creators of each selected design WIN a FREE shirt! We will also be discussing future events for the semester, so bring ideas.

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