

PROBLEM SOLVING

THE SOLUTION: There's a 44 percent (more precisely, $7/16$) chance that the professors will meet.

Here's how to solve the problem:

Associate each arrival time between 1 p.m. and 2 p.m. with a real number r such that $0 < r < 1$. The number r represents the part of the hour that has elapsed before the arrival. In this way the arrival times of the two professors determine a coordinate pair (x, y) that corresponds to a point in the unit square with $0 < x < 1$, $0 < y < 1$.

The pair (x, y) corresponds to a situation where the professors fail to meet if either $y > x + \frac{1}{4}$ or $x > y + \frac{1}{4}$ (see below).

In the first of these cases the point (x, y) lies in the triangle that lies above the line $y = x + \frac{1}{4}$. The area of this triangle is $\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4} = \frac{9}{32}$. Similarly, in the second case, the point (x, y) lies in the triangle with area $\frac{9}{32}$ that lies below the line $x = y + \frac{1}{4}$. We deduce that the probability that the professors do not meet is $\frac{9}{32} + \frac{9}{32} = \frac{9}{16}$.

Bearing in mind that a 100 percent guaranteed meeting would be $\frac{16}{16}$, you subtract the probability you've derived of their not meeting ($\frac{9}{16}$) from that to get the probability that they will meet, $\frac{7}{16}$.

The
**CUNY Math
Challenge**

