Math 166H §B **Project 1** **Due 9/30/2005**

1. A pin of length 1 is dropped onto the coordinate plane. Given that the pin falls flat at an angle α with the positive x-axis, what is the probability that the pin touches at least one of the lines $y = n$, where n is any integer? Justify your answer.

2. A pin of length 1 is dropped onto the coordinate plane. What is the probability that the pin touches at least one of the lines $y = n$, where n is any integer? Justify your answer. *Note:* As opposed to the previous problem, the pin can make any angle with the positive x-axis in this problem.

3. *(extra)* Redo Problems 1 and 2 above to find the probability that the pin touches at least one of the horizontal lines $y = n$ *and* at least one of the vertical lines $x = m$, where m and n are any integers.

4. *(extra)* Use the results Problems 1, 2 and 3 above to find the probability that the pin touches at least one of the horizontal lines $y = n$ *or* at least one of the vertical lines $x = m$, where m and n are any integers.