Probability Theory: Buffon Needle Problem

Key words:

1. Probability
2. Mutually Exclusive events
3. Random variable
4. Expectation
5. Properties of Expectation

Buffon's needle problem: Suppose that you drop a short needles on ruled paper- what is then the probability that the needle come to lie in a position where it crosses one of the lines ?

Prove the following

Theorem 1 *If a short needle of length l, is dropped on paper that is ruled with equally spaced lines of distance $d \leq l$, then the probability that the needle comes to lie in a position where it crosses one of the lines is exactly*

$$p = \frac{2l}{\pi d}.$$

Mathematician in Focus Le Comte de Buffon and E. Barbier.