

**DoNow**1. *Geometric Series*

(a) Draw a picture to show that the series

$$1 + \frac{1}{2} + \frac{1}{2^2} + \dots + \frac{1}{2^n} + \dots$$

converges.

(b) Show how to find  $S_n = \sum_{k=0}^n ar^k$ (c) Under what conditions will the sequence  $\{S_n\}$  converge as  $n \rightarrow \infty$ ?**Main Event**2. *Dropping Nails*

Suppose we have a floor made of parallel strips of wood, each the same width, say  $w$ . Now drop carpenter's nails of length  $l$  onto the floor.

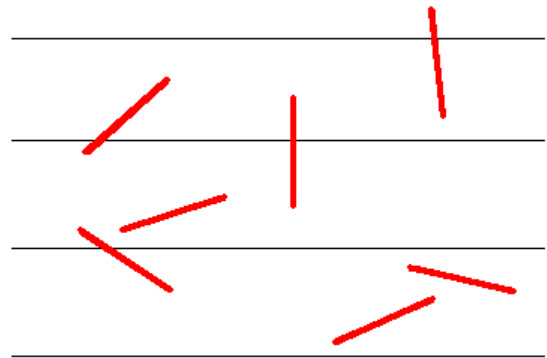


Diagram shows a small sample

- (a) Assuming  $l = w$  what is the probability that a nail crosses a line between two strips?
- (b) Reconsider the problem assuming  $l < w$ .
- (c) Reconsider the problem assuming  $w < l < 2w$ .

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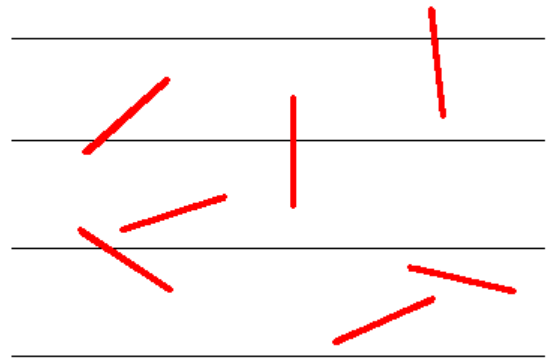


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