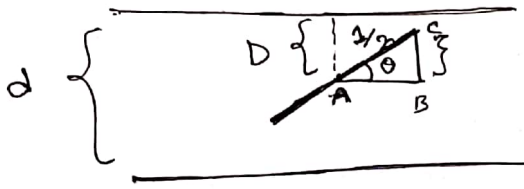
Buffon's Needle
(Using Python)

Simple Form :-



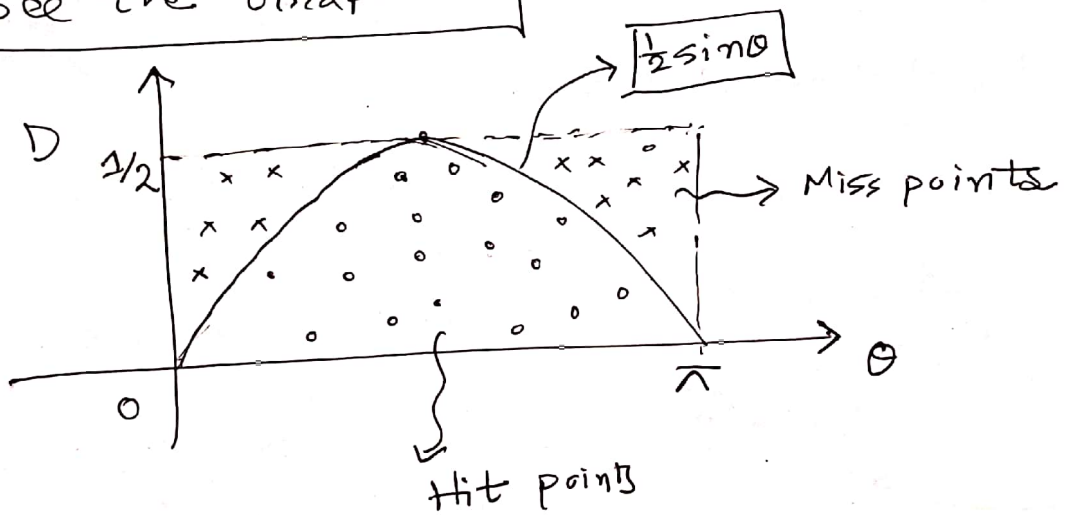
Here, $d = 1, b = 1$

$BC = \frac{1}{2}\sin\theta$

So Needle will hit the line if $D \leq BC$

or $D \leq \frac{1}{2}\sin\theta$

So See the Graph :-



$$\frac{\text{Number of Hits}}{\text{Total shots/trials}} = \frac{\text{Area of curved part}}{\text{Area of whole rectangle}} = \frac{2}{\pi}$$

So $$\pi = 2 * \frac{\text{Total number of trials}}{\text{Total hits}}$$

Pseudocode :-

For each trial :
- choose value of D randomly
- choose value of θ "
- check $D \leq \frac{1}{2}\sin\theta$ if yes ; hits ++.