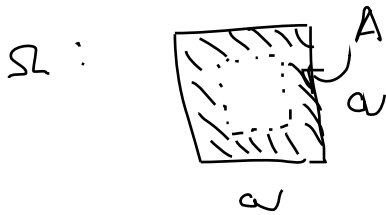
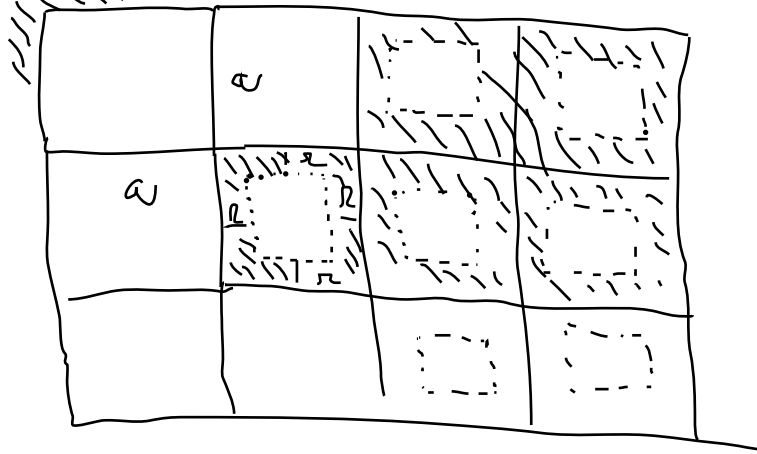


4.1:

ω ... výsledek experimentu --- poloha středu mince
 Ω :



$$|\Omega| = a^2$$

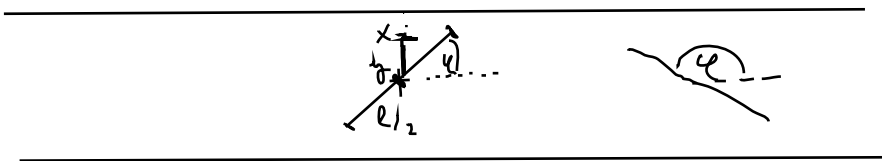
$$|A| = a^2 - (a - 2r)^2$$

$$P(A) = \frac{|A|}{|\Omega|} = 1 - \frac{(a - 2r)^2}{a^2}$$

Pro $r \geq \frac{a}{2}$: $P(A) = 1$,

otázka 5: [B], [D] ... dvě různé reprezentace stejného problému

4.2:



$\varphi \in [0, \pi]$
 $y \in [0, l \sin \varphi]$
 ? $y = \frac{l}{2} \sin \varphi$
 ? $P(y > x)$

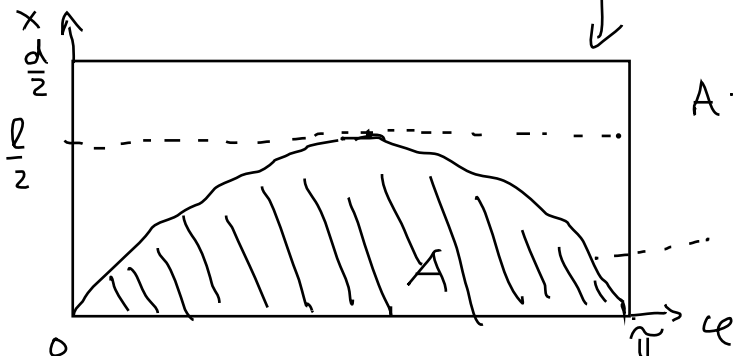
výsledek experimentu: (x, φ) ... x ... vzdálenost středu
 jehly od přímek

$$x \in [0, d/2]$$

φ ... úhel jehly

$$\varphi \in [0, \pi)$$

$$\Omega = [0, d/2] \times [0, \pi) \Rightarrow |\Omega| = \frac{\pi d}{2}$$



$$A = \left\{ (x, \varphi) : x \leq \frac{l}{2} \sin \varphi, x \in [0, d/2], \varphi \in [0, \pi) \right\}$$

$$x = \frac{l}{2} \sin \varphi$$

$$|A| = \int_0^{\pi} \frac{l}{2} \sin \varphi \, d\varphi = \frac{l}{2} [-\cos \varphi]_{\varphi=0}^{\pi} = \frac{l}{2} (1 - (-1)) = l$$

$$P(A) = \frac{|A|}{|S_2|} = \frac{l}{\frac{\pi d}{2}} = \frac{2l}{\pi d} \quad l < d$$

