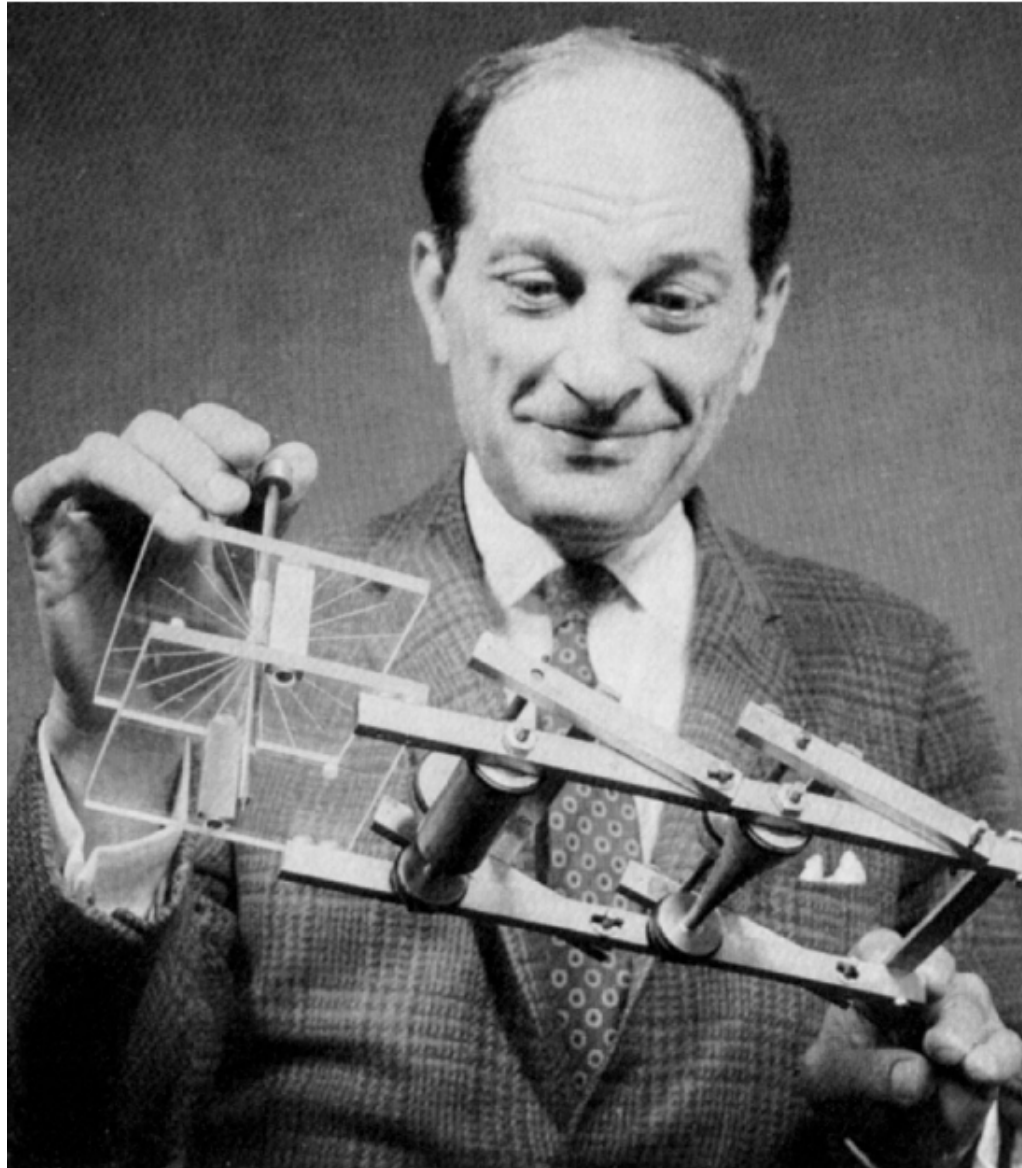


Monte Carlo Simulation



Photo by Sam Garza

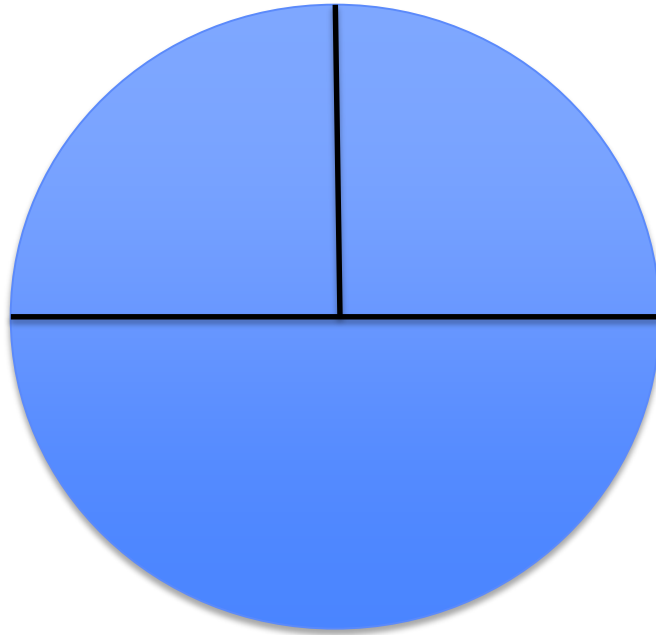
Stanislaw Ulam



Finding Pi

3.1415926535897932384626433832795028841971693
99375105820974944592307816406286208998628034
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05822317253594081284811174502841027019385211
05559644622948954930381964428810975665933446
12847564823378678316527120190914564856692346
03486104543266482133936072602491412737245870
06606315588174881520920962829254091715364367
89259036001133053054882046652138414695194151
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93105118548074462379962749567351885752724891
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93176752384674818467669405132000568127145263
56082778577134275778960917363717872146844090
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19956112129021960864034418159813629774771309
96051870721134999999837297804995105973173281
60963185950244594553469083026425223082533446
85035261931188171010003137838752886587533208
38142061717766914730359825349042875546873115
95628638823537875937519577818577805321712268
06613001927876611195909216420198

Image from Tom Murphy



$$\frac{\textit{circumference}}{\textit{diameter}} = \Pi \quad \textit{area} = \Pi * \textit{radius}^2$$

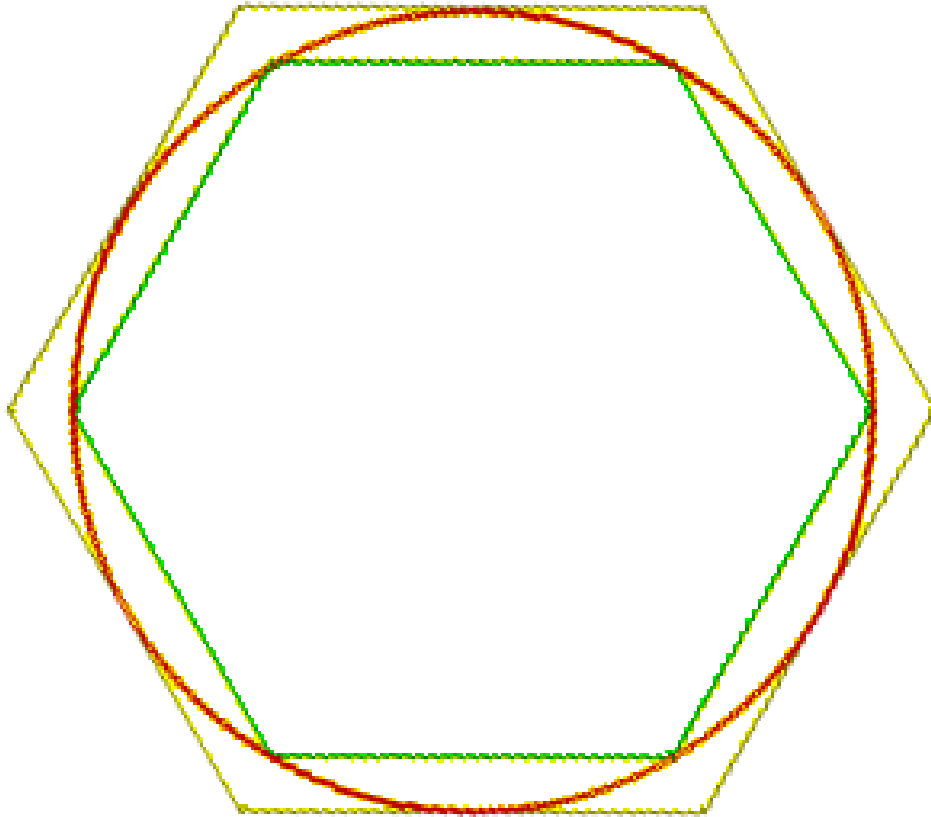
Rhind Papyrus



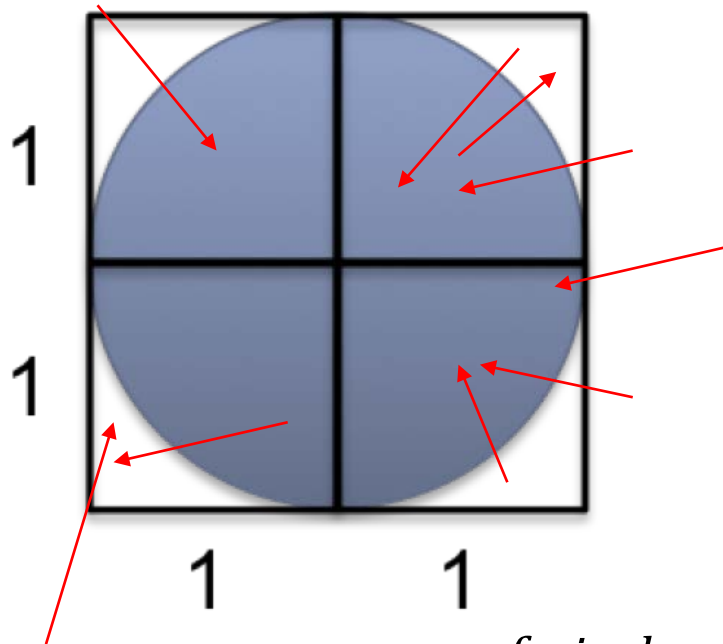
“And he made a molten sea, ten cubits from the one brim to the other: it was round all about, and his height was five cubits: and a line of thirty cubits did compass it round about.”

—1 Kings 7.23

Archimedes



Buffon-Laplace



$$A_s = 2 * 2 = 4$$

$$A_c = \pi r^2 = \pi$$

$$\frac{\text{needles in circle}}{\text{needles in square}} = \frac{\text{area of circle}}{\text{area of square}}$$

$$\text{area of circle} = \frac{\text{area of square} * \text{needles in circle}}{\text{needles in square}}$$

$$\text{area of circle} = \frac{4 * \text{needles in circle}}{\text{needles in square}}$$

Arrows Are More Fun than Needles



Photo Dharma

Not a Practical Method

- In the next segment, we take Ana's advice and build a simulation