



Jacob D. Bernoulli (1659–1705)

Even the stupidest man —by some instinct of nature *per se* and by no previous instruction (this is truly amazing) —knows for sure that the more observations ...that are taken, the less the danger will be of straying from the mark. ---*Ars Conjectandi* (The Art of Guessing), 1713*

May 13, 2013

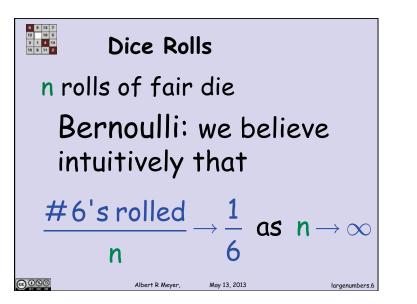
http://www.dartmouth.edu/~chance/teaching_aids/books_articles/probability_book/book.htm Introduction to Probability, American Mathematical Society, p. 310.

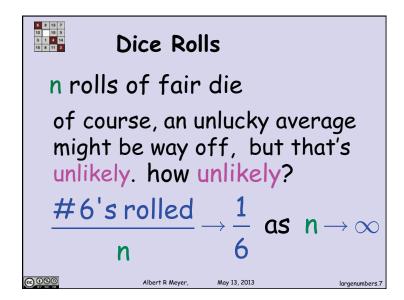
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Dice R	olls
n rolls of fa Pr[ro	$[16] = \frac{1}{2}$
Avg #6's	∷= 6
#6's rolle	<u>d</u>
n	
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6 9 13 12 10 3 1 4 15 8 13	$\Pr[Average = 1/6 \pm \%]$				
	n	±10%			
	6	0.4			
	60	0.26		Pr	
	600	0.72		bigger	
	1200	0.88		with	
	3000	0.98		# rolls	
	6000	0.999		¦ ♥	
0000		Albert R Meye	er, May 13, 2013	largenumbers.8	

4 9 13 12 10 3 1 4 15 8 13	$\Pr[\text{Average} = 1/6 \pm \%]$				
	n	±10%	±5%		
	6	0.4	0.4		
	60	0.26	0.14		Pr
	600	0.72	0.41		bigger
	1200	0.88	0.56		with
	3000	0.98	0.78		# rolls
	6000	0.999	0.91		
0000	Pr smaller for better %				

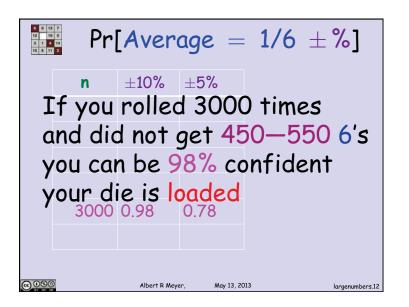
6 9 13 12 10 3 1 4 16 8 11	$\Pr[\text{Average} = 1/6 \pm \%]$				
	n	±10%	±5%		
	6	0.4	0.4		
	60	0.26	0.14	Pr	
	600	0.72	0.41	bigger	
	1200	0.88	0.56	with	
	3000	0.98	0.78	# rolls	
	6000	0.999	0.91	¥	
0000	Pr smaller for better % Albert R Meyer, May 13, 2013 largenumbers.1				

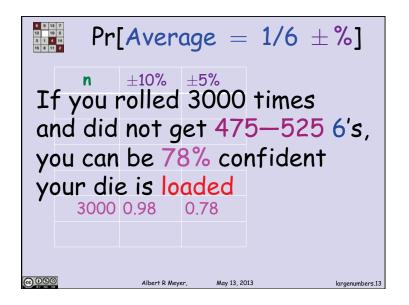
 4
 9
 13
 57

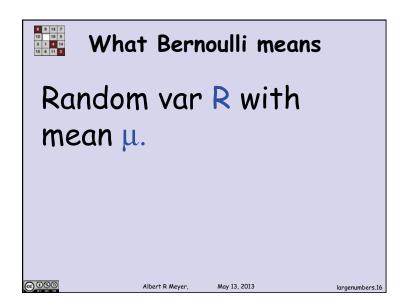
 12
 10
 15

 3
 3
 4
 14

 15
 8
 13
 2
 $Pr[Average = 1/6 \pm \%]$ ±10% ±5% n If you rolled 3000 times and did not get 450-550 6's 3000 0.98 0.78 @09 Albert R Meyer May 13, 2013 largenumbers.11









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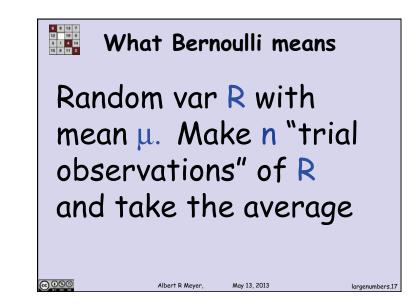
Jacob D. Bernoulli (1659–1705)

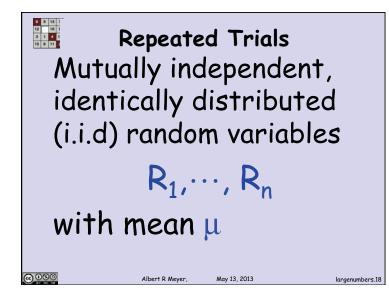
It certainly remains to be inquired whether after the number of observations has been increased, the probability...of obtaining the true ratio...finally exceeds any given degree of certainty; or whether the problem has, so to speak, its own asymptote —that is, whether some degree of certainty is given which one can never exceed.

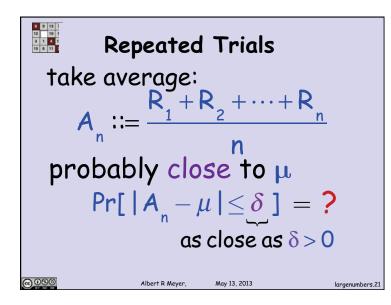
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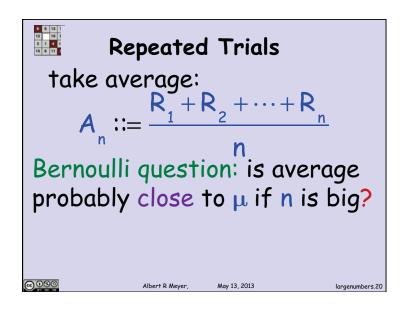
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Albert R Meve











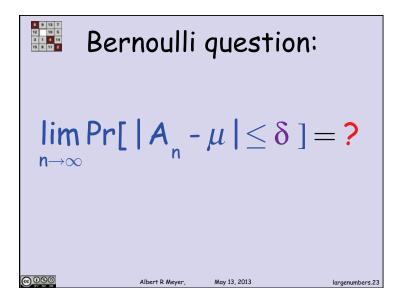
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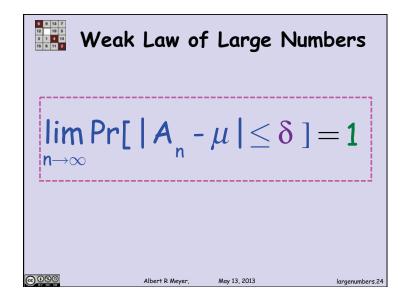
Therefore, this is the problem which I now set forth and make known after I have pondered over it for twenty years. Both its novelty and its very great usefulness, coupled with its just as great difficulty, can exceed in weight and value all the remaining chapters of this thesis.

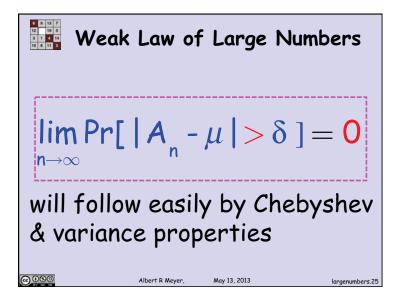
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