

# 605 - Week 8 Discussion

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## Chapter 8: Law of Large Numbers

4 A 1-dollar bet on craps has an expected winning of  $-.0141$ . What does the Law of Large Numbers say about your winnings if you make a large number of 1-dollar bets at the craps table? Does it assure you that your losses will be small? Does it assure you that if  $n$  is very large you will lose?

The game of Craps is played by betting on the the prediction of what the roll of two dice is going to be. The negative expected winnings of  $-0.0141$  was calculated from the roll probabilities and the win&lose cost of the rolls per game. The expected winning is the expected average loss per game. It does not say that you will exactly lose this much per game but what the average loss will be.

Playing a large number of games will not change this average loss per game. Instead the actual loss per game will approach the expected loss per game. A very large number ( $n$ ) of games will lead to a loss of  $n \cdot 0.0141$  per game.