

## Question

- Let  $X_1$  and  $X_2$  be random variables, and  $Y = X_1 + X_2$ .
- What is the distribution of  $Y$ , given that we know those of  $X_1, X_2$ ?
- More generally, if we know  $X_i$ , then what is distribution of

$$Y = \sum_{i=1}^n X_i$$

## Wait a second

- Isn't the Law of Large Numbers all about sums of random variables?
- So, I thought we were done....
- Note: LLN only works in the limit  $n \rightarrow \infty$
- Here we're thinking of a specific, finite,  $n$ 
  - We roll 10 dice, what is distribution of sum?