## Dr. K. Karuppasamy

www.drkk.in

## Yahoo answers 2-10-2013

Problem: A street vendor is asking people to play a simple game. You roll a pair of dice. If the sum on the dice is 10 or higher, you win $\$ 10$. If you roll a pair of 1 's, you win $\$ 50$. Otherwise you lose $\$ 5$. If the random variable $X$ equals your win or loss for each play, find $M=E(x)$. Figure out how much we expect to win or lose for each play on average. Is it wise to play this game? WHY?

Solution: When throwing two dice, the favourable cases for getting the sum as 10 or more are $\{(4,6),(5,5),(6,4),(5,6),(6,5),(6,6)\}$. Hence its probability is 6/36.

The probability of getting $(1,1)$ is $1 / 36$.
Hence the probability for none of the above case is $1-6 / 36-1 / 36=29 / 36$.

The probability distribution is

| $\mathrm{X}=\mathrm{x}$ | 10 | 50 | -5 |
| :---: | :---: | :---: | :---: |
| $\mathrm{P}(\mathrm{x})$ | $6 / 36$ | $1 / 36$ | $29 / 36$ |

$E(X)=\sum x P(x)=10(6 / 36)+50(1 / 36)+(-5)(29 / 36)=-35 / 36$.
On an average we have to loss $\$ 35 / 36$. It is not wise to play the game.

