

Probabilities and random variables.

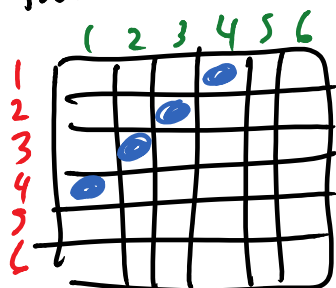
Remember: random variables themselves do not have probabilities.

E.g. makes no sense to say $P(X) = _$.

Only events have probabilities. (If I say an outcome has a probability, I really mean an event with just that outcome has a probability.)

What does $P(X=5)$ mean? It really means $P(A)$ where A is an event contains all outcomes that give $X=5$.

Roll two dice



$P(X=5)$ means

$$P(\{(1,4), (2,3), (3,2), (4,1)\}) = \frac{4}{36} = \frac{1}{9}$$

Say for simplicity $P(X=5) = \frac{1}{9}$
but the above meaning is understood.