

5-11-15

Probability Day 1

Basic Probability

$$P(X) = \frac{\text{number of ways } X \text{ can occur}}{\text{number of total outcomes}}$$

↑
probability of X happening

fraction, percentage, decimal

Values from 0 to 1
no chance absolute certainty

Example: if you roll a pair of dice,
what is the probability of the sum of 5 shows?

make a chart of all outcomes

Sum	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

$$\text{total} = 5 \times 5 = 25$$

$$\text{total} = 36$$

$$P(X) = \frac{4}{36}$$

$$= \frac{1}{9}$$

1 in 9 chance rolling a 5.

Ex 2 Make a list

3 dice, what is the probability that they will sum to 5?

die 1	die 2	die 3	
(1 1 3) ①	(1 2 2) ②	(1 3 1) ③	(1 4 X NP)
(2 1 2) ④	(2 2 1) ④	(2 3 X NP)	
(3 1 1) ⑥	(3 2 X NP)		

Ways of getting a 5 = 6

throwing 3 dice = $6 \times 6 \times 6 = 216$ ways

$$P(5) = \frac{6}{216} = \frac{1}{36}$$

Chances of getting a 5 are 1 in 36

EX3 One card from a Standard Deck, what is the probability of getting a heart?

13 hearts out of 52 card

$$P(\text{heart}) = \frac{13}{52} = \frac{1}{4}$$