

Simple probabilities

$$p = \frac{n}{N} \quad \begin{array}{l} \# \text{ ways event can occur} \\ \text{total \# of ways.} \end{array}$$

equiprobable
events

Tossing a coin

$$p(\text{Heads}) = \frac{1}{2} = 0.5$$

Rolling a die 

$$p(1) = \frac{1}{6} = 0.1\bar{6}$$

$$p(\text{even}) = \frac{3}{6} = 0.5$$

Dealing a card 4 suits, 13 ranks Ace 2 3 4 5 6 7 8 9 10 J Q K

$$p(\text{Ace of Spades}) = \frac{1}{4 \cdot 13} = \frac{1}{52}$$

$$p(\text{red card}) = \frac{\frac{2 \cdot 13}{2}}{4 \cdot 13} = \frac{26}{52} = \frac{1}{2} = 0.5$$

$$p(\text{face card}) = \frac{4 \cdot 3}{52} = \frac{12}{52} = 0.23076923$$

$$p(\text{face card or even \#}) = \frac{12 + (5 \cdot 4)}{52} = \frac{32}{52} = 0.6154...$$