Probability

H, T $P(H) + P(\text{not } H) = 1$

$P(H) = \dfrac{1}{2}$

$P(\text{Not } H) = \dfrac{1}{2}$

$\rightarrow$ Tossing a coin.

$P(\text{Red}) = \dfrac{5}{5} = 1$

Experiment

$P(\varepsilon) = \dfrac{\text{no of outcomes favourable to } \varepsilon}{\text{total no of possible outcomes}}$

Sure event

$\downarrow$

Outcomes

$P(\varepsilon) = \dfrac{3}{6} = \boxed{\dfrac{1}{2}}$

Impossible event

$P(\varepsilon) = \dfrac{0}{5} = 0$
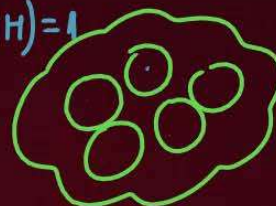
Head, Tail

(ii) Throwing a dice

$P(\text{odd no}) = \dfrac{3}{6} = \dfrac{1}{2}$ $P(\varepsilon) = 0.5$

$0 \leq P(\varepsilon) \leq 1$ $P(\varepsilon) = 1.1 \ X$

$0\% \leq P(\varepsilon) \leq 100\%$.

Outcomes $= \boxed{1, 2, 3, 4, 5, 6}$

$P(\varepsilon) + P(\text{Not } \varepsilon) = 1$

$\varepsilon =$ no Showing on dice is even

$P(\text{not } \varepsilon) = 1 - 0.5 = \boxed{0.5}$

$P(\text{Not } \varepsilon) = 0.05$

$P(\varepsilon) = ?$

Coin

①

H, T

$P(H) = \frac{1}{2}$

$P(T) = \frac{1}{2}$

$P(\text{Not } T) = P(H) = \frac{1}{2}$

\# ②

HH, TT, HT, TH.

$P(1 \text{ head}) = \frac{3}{4}$

$P(2 \text{ tai}) = \frac{1}{4}$

$P(2 \text{ head}) = \frac{1}{4}$

$P(\text{at least } 1 \text{ head}) = \frac{3}{4}$

$P(\text{at most } 1 \text{ head}) = \frac{3}{4}$

$$1, 2, 3, \boxed{4, 5,} 6$$

(i) $P(\text{odd no}) = \dfrac{3}{6} = \dfrac{1}{2}$

(ii) $P(\text{even no}) = \dfrac{3}{6} = \dfrac{1}{2}$

(iii) $P(\text{Prime no}) = \dfrac{3}{6} = \dfrac{1}{2}$

(iv) $P(\text{no} < 7) = \dfrac{6}{6} = 1$

$P(\text{no} > 6) = \dfrac{0}{6} = 0$

$P(3 < \text{no} < 6) = \dfrac{2}{6} = \dfrac{1}{3}$

Double Dice

n
6

$6^1 = 6$
$6^2 = 6 \times 6 = 36 \checkmark$

A, B

(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1, 6)
(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)
(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)	(3, 6)
(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)	(4, 6)
(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)	(5, 6)
(6, 1)	(6, 2)	(6, 3)	(6, 4)	(6, 5)	(6, 6)

$36 - 11 = \underline{25}$

(i) $P(A = B) = \dfrac{6}{36} = \dfrac{1}{6}$

(ii) $P(A + B = 10) = \dfrac{3}{36} = \dfrac{1}{12}$

(iii) $P(A + B = 7) = \dfrac{6}{36} = \dfrac{1}{6}$

(iv) $P(A + B = 2) = ?$

(v) $P(\text{5 on either dice}) = \dfrac{11}{36}$

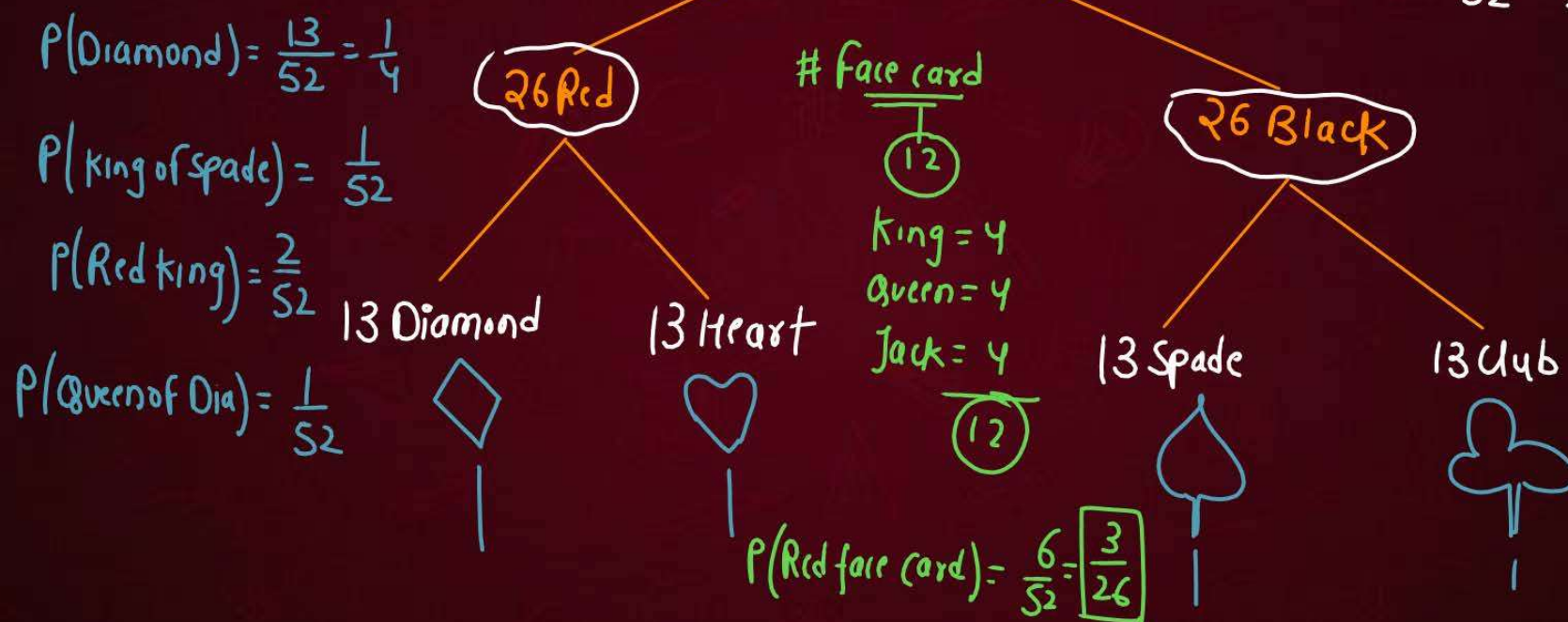(vi) $P(\text{5 in neither dice}) = \dfrac{25}{36} \checkmark$

Playing Cards

$P(\text{Black Jack}) = ?$

(i) $P(\text{Black}) = \dfrac{26}{52} = \dfrac{1}{2}$

(ii) $P(\text{Red}) = \dfrac{26}{52} = \dfrac{1}{2}$

$P(\text{Diamond}) = \dfrac{13}{52} = \dfrac{1}{4}$

$P(\text{King of Spade}) = \dfrac{1}{52}$

$P(\text{Red King}) = \dfrac{2}{52}$

$P(\text{Queen of Dia}) = \dfrac{1}{52}$

52

26 Red

26 Black

face card

12

King = 4
Queen = 4
Jack = 4

12

13 Diamond

13 Heart

13 Spade

13 Club

$P(\text{Red face card}) = \dfrac{6}{52} = \boxed{\dfrac{3}{26}}$

A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8 (see given fig.), and these are equally likely outcomes. What is the probability that it will point at

(i) 8 ? ✓
(ii) an odd number? ✓
(iii) a number greater than 2? ✓
(iv) a number less than 9? ✓

(IV) $P(E) = $ Comment

(i) $P(8) = \dfrac{1}{8}$

(ii) $P(odd\ no) = \dfrac{4}{8} = \dfrac{1}{2}$

(iii) $P(E) = \dfrac{6}{8} = \dfrac{3}{4}$

The probability that a non-leap year selected at random will contains 53 Mondays.

$$\boxed{365 \text{ Days}} \checkmark$$

×

$52 \to \text{Monday}$

$$7 \overline{)365} \;\; (52)$$
$$\underline{-35\downarrow}$$
$$\quad 15$$
$$\underline{-14}$$
$$\quad \textcircled{1}$$

Sunday
Monday
Tuesday
wed
Thru
Fri
Sat

$$P(\varepsilon) = \frac{1}{7}$$