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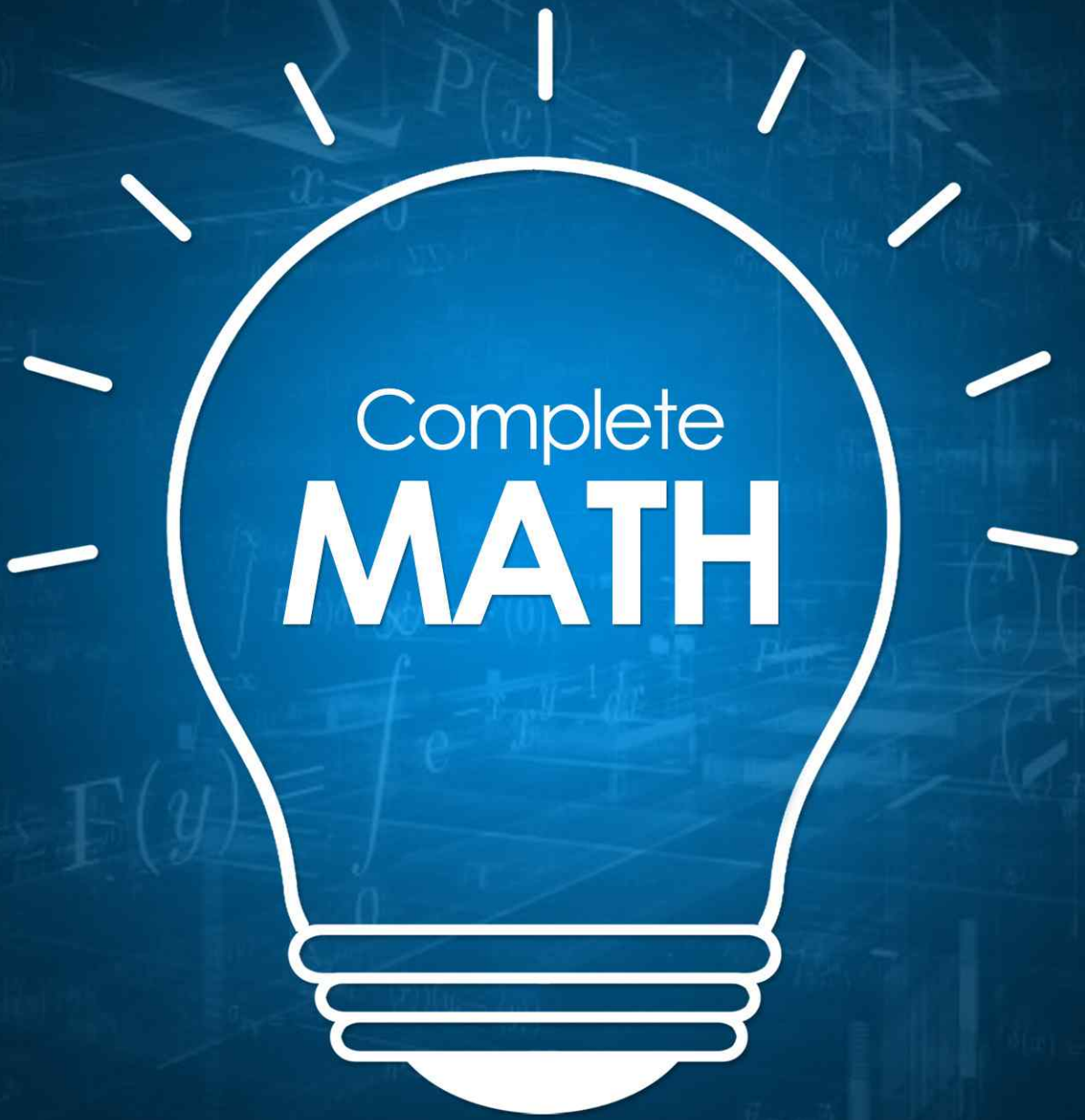

Complete MATH

IIT-JEE · CBSE eBOOKS

CLASS 11&12th

CLASS 11th

Probability

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01. Some Definitions

Elementary Event *If a random experiment is performed, then each of its outcomes is known as an elementary event.*

Sample Space *The set of all possible outcomes of a random experiment is called the sample space associated with it and it is generally denoted by S.*

In other words, the set of all elementary events associated to a random experiment is called its sample space.

Remark 1 *Elementary events associated to a random experiment are also known as indecomposable events.*

Occurrence Of An Event *An event A associated to a random experiment is said to occur if any one of the elementary events associated to it is an outcome.*

Thus, if an elementary event E is an outcome of a random experiment and A is an event such that $E \in A$, then we say that the event A has occurred.

Negation of An Event *Corresponding to every event A associated with a random experiment we define an event "not A" which occurs when and only when A does not occur.*

It follows from this that the event A occurs iff $\overline{A}$ does not occur.

Favourable Elementary Events *Let S be the sample space associated with a random experiment and A be an event associated to the experiment. Then elementary events belonging to A are known as favourable elementary events to the event A.*

Probability

Definition *If there are n elementary events associated with a random experiment and m of them are favourable to an event A, then the probability of happening or occurrence of A is denoted by P (A) and is defined as the ratio* $\frac{m}{n}$

Thus, $P(A) = \frac{m}{n}$

Clearly, $0 \le m \le n$

$\therefore \quad 0 \le \frac{m}{n} \le 1 \Rightarrow 0 \le P(A) \le 1$

If $P(A) = 1$, then A *is called certain event and* A *is called an impossible event, if* $P(A) = 0$.

The number of elementary event which will ensure the non occurrence of A i.e. which ensure the occurrence of A is $(n - m)$. Therefore,

$$P(\overline{A}) = \frac{n-m}{n}$$

$$\Rightarrow \quad P(\overline{A}) = 1 - \frac{n-m}{n} \Rightarrow P(\overline{A}) = 1 - P(A) \Rightarrow P(A) + P(\overline{A}) = 1$$

The odds in favour of occurrence of the event A are defined by $m : (n - m)$ i.e.; $P(A) : P(\overline{A})$.