

Find Probability of Each Outcome Or a Die

Objective

To find experimental probability of each outcome of a die when it is thrown a large number of times.

Materials Required

1. Notebook
2. A fair die
3. Pen

Prerequisite Knowledge

Basic knowledge of probability and a fair die.

Theory

1. For basic knowledge of probability refer to Activity 33.
2. A fair die is small cube having dots, 1 to 6 on its faces.

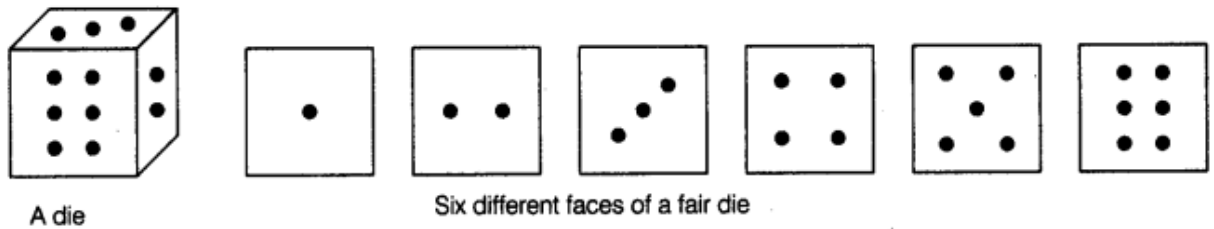


Fig. 34.1

Procedure

1. Firstly, divide the whole class in ten groups, say $G_1, G_2, G_3, \dots, G_{10}$ of a suitable size.
2. Allow all groups to throw a die 100 times and ask them to note down the observations, i.e. the number of times the outcomes 1, 2, 3, 4, 5 or 6 come up.
3. If 1 appears in all the groups a times. Similarly, count the number of times each of 2, 3, 4, 5 and 6 has appeared. Denote them by b, c, d, e and f , respectively.
4. Now, find the probability of each outcome (E) by using the formula,

$$P(E) = \frac{\text{Number of times an outcome occurred}}{\text{Total number of trials}}$$

Demonstration

1. There are 10 groups and all the groups throw a die 100 times. So, the total number of trials is 1000.

2. As, 1 has appeared a times.

Hence, experimental probability of 1, $P(1) = \frac{a}{1000}$

similarly, experimental probability of 2, $P(2) = \frac{b}{1000}$

experimental probability of 3, $P(3) = \frac{c}{1000}$

experimental probability of 4, $P(4) = \frac{d}{1000}$

experimental probability of 5, $P(5) = \frac{e}{1000}$

and experimental probability of 6, $P(6) = \frac{f}{1000}$

Observations

Fill the results of your experiment in the table given below.

Outcome/Group	Number of times a number comes up on a die						Total
	1	2	3	4	5	6	
G1							100
G2							100
G3							100
G4							100
G5							100
G6							100
G7							100
G8							100
G9							100
G10					*		100
Total	a =	b =	c =	d =	e =	f =	1000

Hence,

$$P(1) = \frac{?}{1000}$$

$$P(2) = \frac{?}{1000}$$

$$P(3) = \frac{?}{1000}$$

$$P(4) = \frac{?}{1000}$$

$$P(5) = \frac{?}{1000}$$

$$P(6) = \frac{?}{1000}$$

Result

We have got the experimental probability of each outcome of a die, when it is thrown a large number of times.

Application

The knowledge of probability is used by many statistical institutions in estimating/predicting next action based on available data.

Viva-Voce

Question 1.

How will you define the term trial?

Answer:

A trial is an action which results in one or several outcomes.

Question 2.

What is the probability of an impossible event?

Answer:

0

Question 3.

Does the sum of all the probabilities of all possible outcomes of an experiment more than 1?

Answer:

No, it is equal to 1.

Question 4.

What are the name of scientists who worked on beginning of probability theory?

Answer:

Pascal and Fermat.

Question 5.

What is the minimum probability of an event?

Answer:

0

Question 6.

What is the sum of probabilities of an event and probability of complement of an event?

Answer:

1

Question 7.

What do you mean by favourable outcomes?

Answer:

The outcomes which ensure the occurrence of an event are called favourable outcomes to the event.

Question 8.

What do you understand by a compound event?

Answer:

A collection of two or more elementary events associated with a random experiment is called compound event.

Suggested Activity

Find the experimental probability of getting an even number on a die when it is thrown a large number of times.