

Activity 32

OBJECTIVE

To write the sample space, when a die is rolled once, twice -----

MATERIAL REQUIRED

A die, paper, pencil/pen, plastic discs, marked with 1, 2, 3, 4, 5 or 6.

METHOD OF CONSTRUCTION

1. Throw a die once. The number on its top will be 1, 2, 3, 4, 5 or 6.
2. Make a tree diagram showing its six branches with number 1, 2, 3, 4, 5 or 6 (See Fig. 32.1)
3. Write the sample space of these outcomes.
4. Throw a die twice. It can fall in any of the 36 ways as shown in Fig. 32.2 by the tree diagram. Write the sample space of these outcomes.

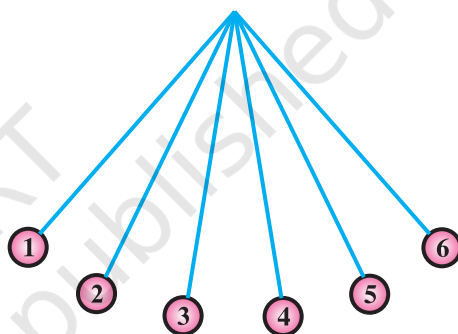


Fig 32.1

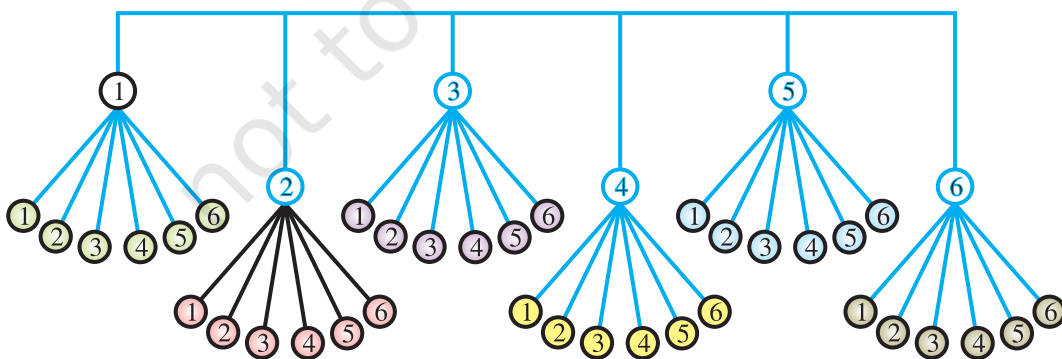


Fig 32.2

5. Repeat the experiment by throwing a die 3 times, and write the sample space of the outcomes using a tree diagram.

DEMONSTRATION

1. If a die is thrown once, the sample space is

$$S = \{1, 2, 3, 4, 5, 6\}. \text{ Number of elements in } S = 6 = 6^1$$

2. If a die is thrown twice, the sample space is

$$\text{Sample space } S = \left\{ \begin{array}{l} (1,1), (1,2), (1,3), (1,4), (1,5), (1,6), (2,1), (2,2), (2,3), (2,4), (2,5), (2,6) \\ (3,1), (3,2), (3,3), (3,4), (3,5), (3,6), (4,1), (4,2), (4,3), (4,4), (4,5), (4,6) \\ (5,1), (5,2), (5,3), (5,4), (5,5), (5,6), (6,1), (6,2), (6,3), (6,4), (6,5), (6,6) \end{array} \right\}$$

The number of elements in $S = 36 = 6^2$ and so on.

OBSERVATION

Number of elements in sample space when a die is thrown

Once = _____, Thrice = _____, Four times = _____

APPLICATION

Sample space of an experiment is useful in determining the probabilities of different events associated with the sample space.

Activity 33

OBJECTIVE

To write the sample space, when a coin is tossed once, two times, three times, four times.

MATERIAL REQUIRED

One rupee coin, paper pencil/pen, plastic circular discs, marked with Head (H) and Tail (T).

METHOD OF CONSTRUCTION

1. Toss a coin once. It can have two outcomes – Head or Tail.
2. Make a tree diagram showing the two branches of a tree - with H (Head) on one branch and T (Tail) on the other (see Fig. 33.1).
3. Write its sample space.
4. Toss a coin twice. It can have four outcomes (see Fig. 33.2)
5. Repeat the experiment with tossing the coin three times, four times,, n and write their sample spaces, if possible. (see Fig. 33.3 and 33.4).

DEMONSTRATION

1. If a coin is tossed once, the sample space is

$$S = \{H, T\}$$

$$\text{Number of elements in } S = 2 = 2^1$$

2. When a coin is tossed twice, the sample space is

$$S = \{HH, HT, TH, TT\}$$

$$\text{Number of elements in } S = 4 = 2^2$$



Fig. 33.1

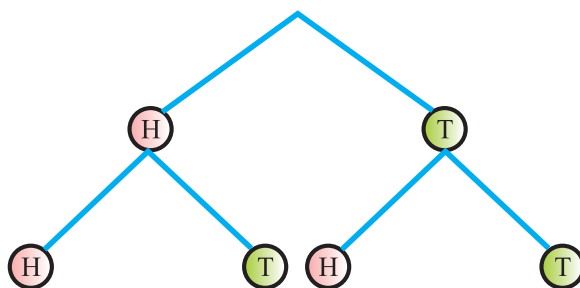


Fig. 33.2

3. When a coin is tossed three times, the sample space is

$$S = \{HHH, HHT, HTH, HTT, THH, THT, TTH, TTT\}$$

$$\text{Number of elements in } S = 8 = 2^3$$

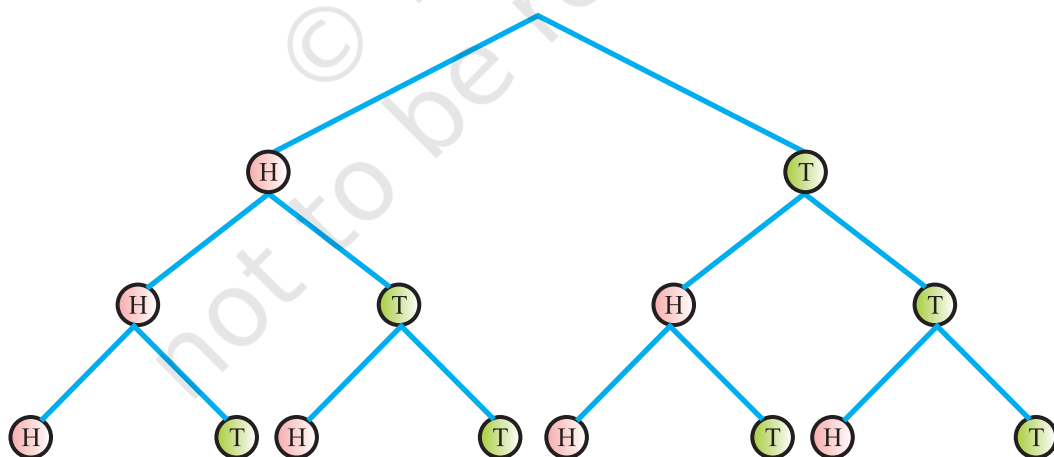


Fig. 33.3

4. When a coin is tossed four times, the S = Sample space is

$$\left\{ \begin{array}{l} \text{HHHH, HHHT, HHTH, HHTT, HTHH, HTHT, HTTH, HTTT,} \\ \text{THHH, THHT, THTH, THTT, TTHH, TTHT, TTTH, TTTT} \end{array} \right\}$$

Number of elements in $S = 16 = 2^4$ and so on.

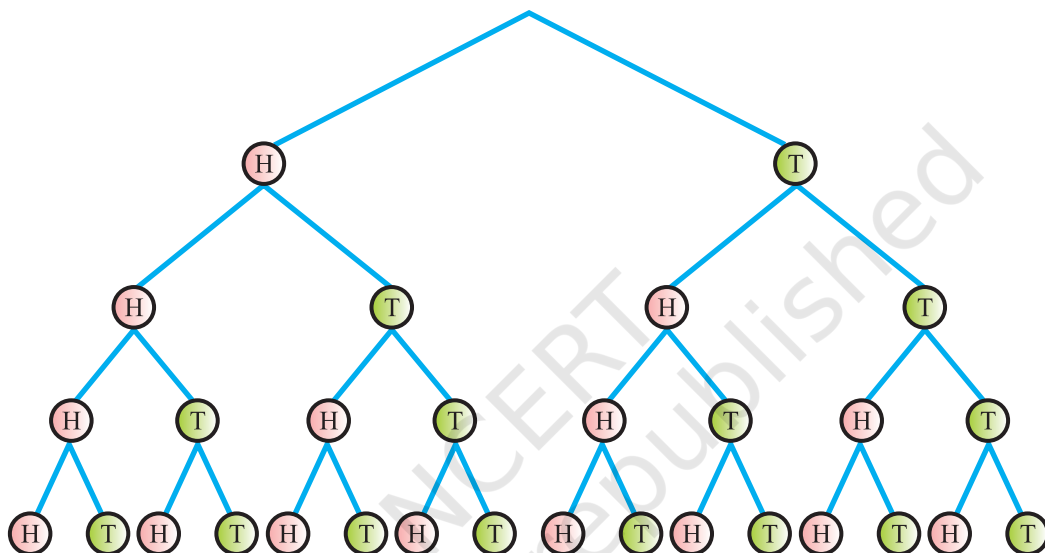


Fig. 33.4

OBSERVATION

Number of elements in sample space, when a

1. coin is tossed once = _____.
2. coin is tossed twice = _____.
3. coin is tossed three times = _____.
4. coin is tossed four times = _____.

APPLICATION

Sample space of an experiment is useful in determining the probabilities of different events associated with the sample space.