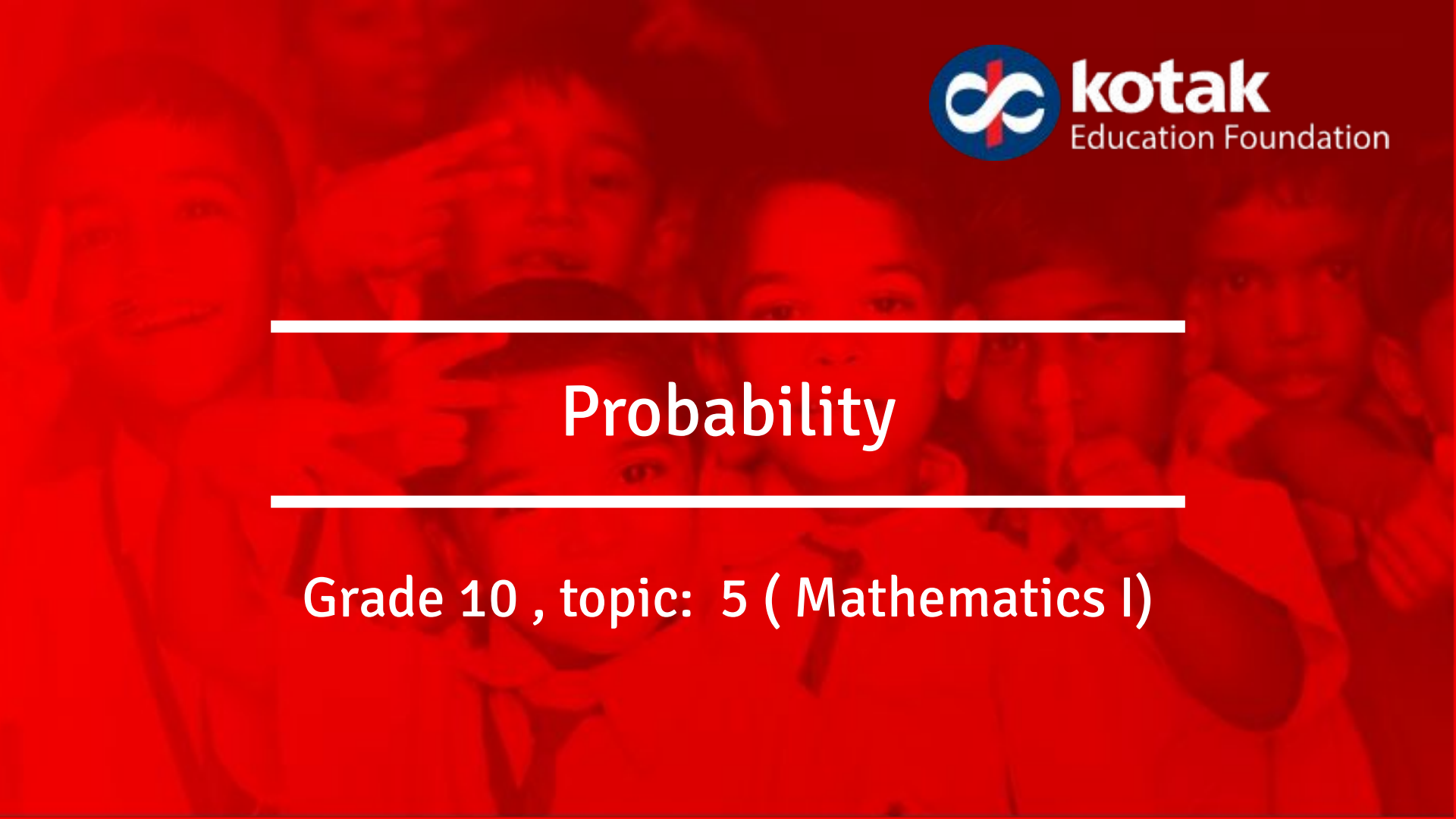


# Probability

Grade 10 , topic:  5 ( Mathematics I)

# Topics

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1. Probability : Introduction
2. Random experiment and its outcome
3. Sample space and event
4. Probability of an event

# Let’s see a few examples

When you throw a coin or a dice which number or side falls?

Any certainty ?

# It can any of these ....

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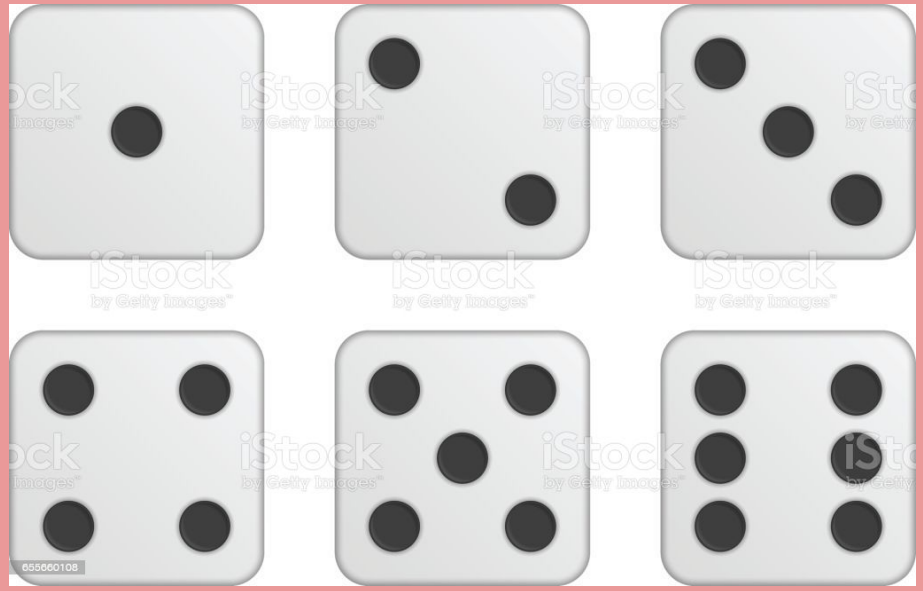
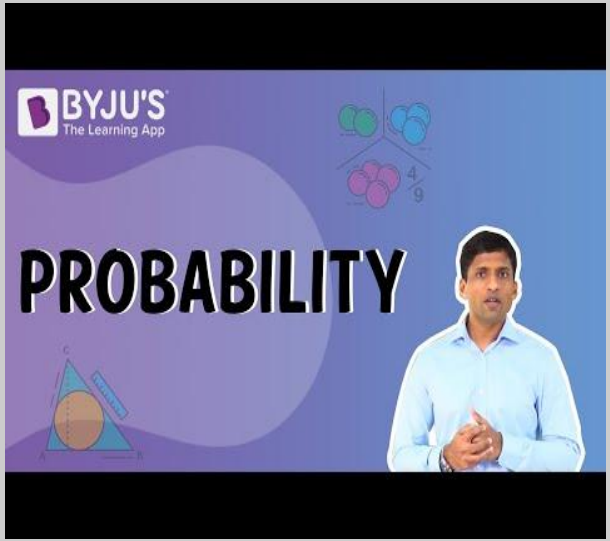
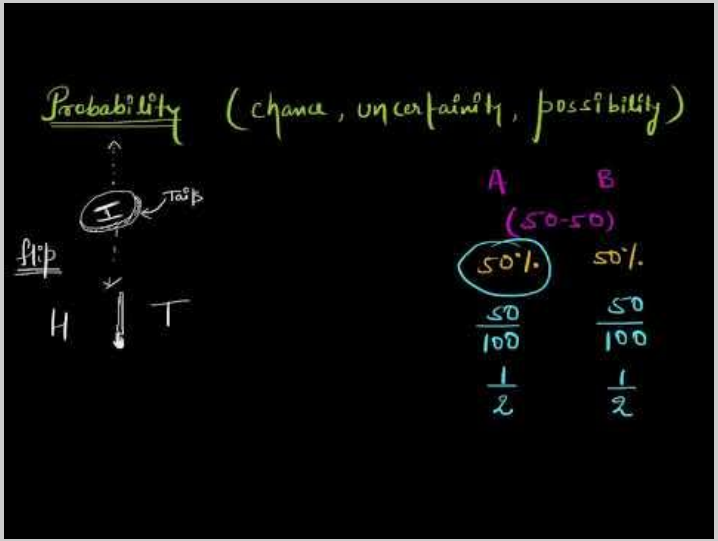


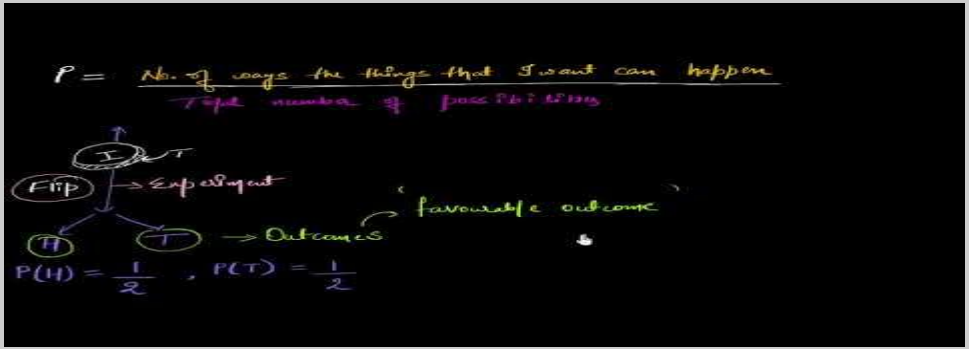
# Let's hear

- https://brilliant.org/practice/probability-warm-up/?p=2



# Related videos



# How certain are you of an event

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Number 6 on the die

$$\frac{1}{6}$$

Number of possible sides on the die

# Explain : Equally Likely Outcomes

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If a die is thrown, any of the numbers from 1, 2, 3, 4, 5, 6 may appear on the upper face. It means that each number is equally likely to occur. However, if a die is so formed that a particular face come up most often, then that die is biased.

In this case the outcomes are not likely to occur equally. Here, we assume that objects used for random experiments are fair or unbiased.

# Event

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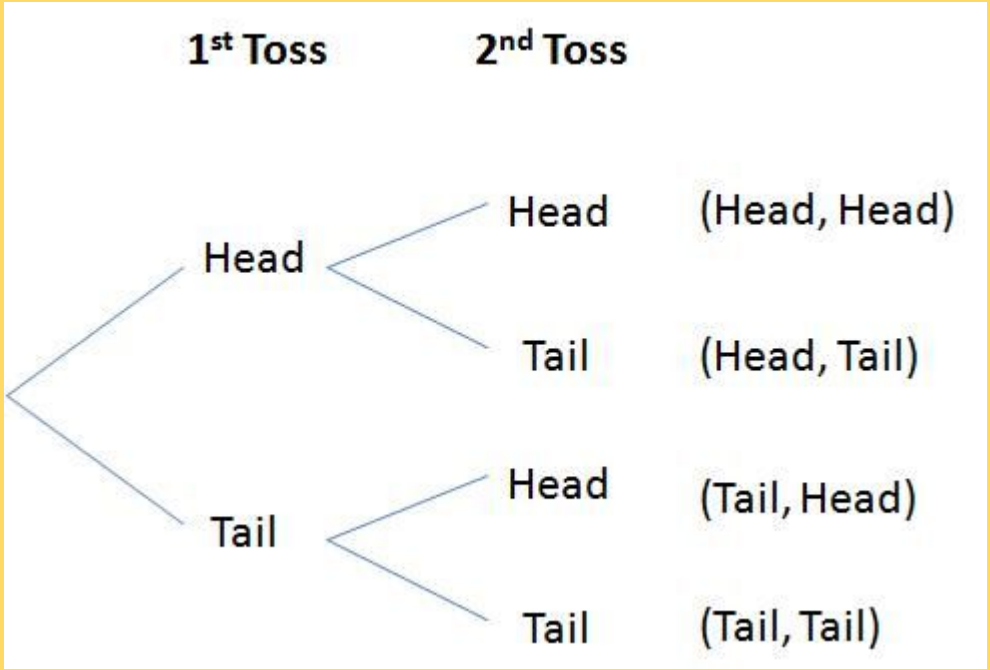
The outcomes satisfying particular condition are called favourable outcomes. A set of favourable outcomes of a given sample space is an 'event'. Event is a subset of the sample space.

Events are generally denoted by capital letters A, B, C, D etc. For example, if two coins are tossed and A is the event of getting at least one tail, then the favourable outcomes are as follows.

A = {TT, TH, HT}

The number of elements in the event A is denoted by n(A). Here n(A) = 3.

# What will be the chances ?




Sample Space for the roll of a 6-sided die:

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

Probability Model for the roll of a die:

| Outcome | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Probability | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 | 1/6 |

# Event

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# Probability of an event

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Let us think of a simple experiment. A bag contains 4 balls of the same size. Three of them are white and the fourth is black. You are supposed to pick one ball at random without seeing it. Then obviously, possibility of getting a white ball is more.

In Mathematical language, when possibility of an expected event is expressed in number, it is called 'Probability' . It is expressed as a fraction or percentage using the following formula. For a random experiment, if sample space is 'S'and 'A' is an expected event then probability of 'A' is P(A). It is given by following formula.

$$P(A) = \frac{\text{Number of sample points in event A}}{\text{Number of sample points in sample spaces}} = \frac{n(A)}{n(S)}$$

# At a glance

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## Probability

- The probability of an event, denoted P(E), is the likelihood of that event occurring.

**The Probability of an Event =**

$$P(\text{Event}) = \frac{\text{the number of ways it can happen}}{\text{the number of possible outcomes}}$$

# Probability of an event

**Ex. (1)** Find the probability of the following, when one coin is tossed.

(i) getting head (ii) getting tail

**Solution :** Let 'S' be the sample space.

$S = \{H, T\}$ $n(S) = 2$

(i) Let event A be getting head

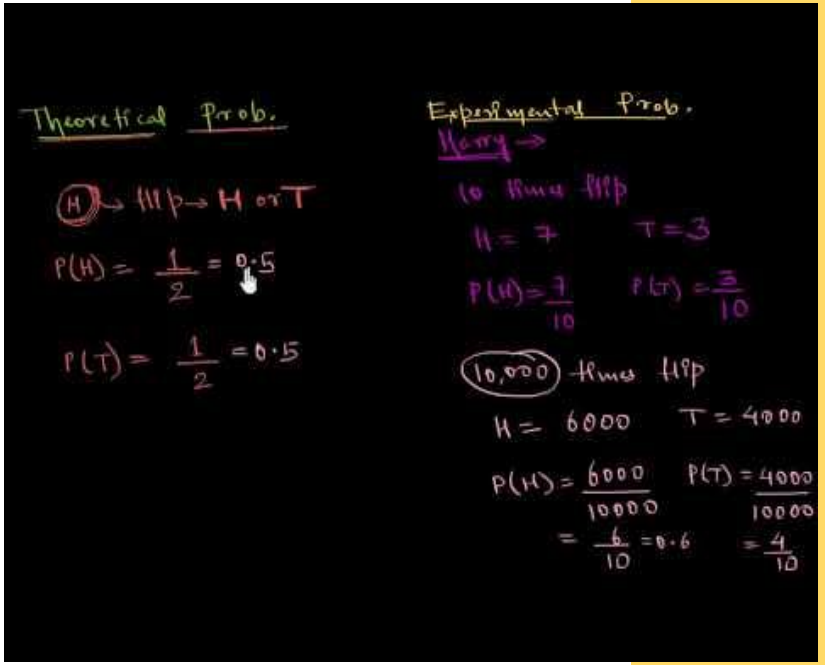
$A = \{H\}$ $\therefore n(A) = 1$

$$P(A) = \frac{n(A)}{n(S)} = \frac{1}{2}$$

(ii) Let event B be getting tail

$B = \{T\}$ $\therefore n(B) = 1$

$$P(B) = \frac{n(B)}{n(S)} = \frac{1}{2}$$

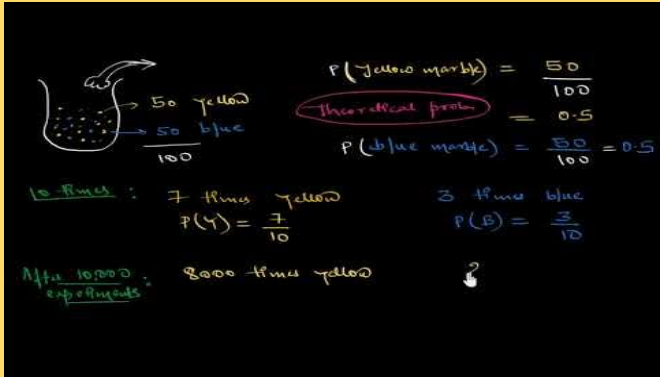


# Let’s understand

A probability is the measurement of what chance some specified outcome has for happening. Probabilities are typically either expressed as a percentage, measured from 0% to 100%, , or a fraction (between 0 to 1)

For example, if you roll a single standard die, the probability of an even number is exactly 50% OR ½ since, of the 6 possible outcomes for what might be rolled, 3 are even and 3 are odd.

https://brilliant.org/practice/probability-warm-up/?p=1



# Can the answer of chances be in decimals ?

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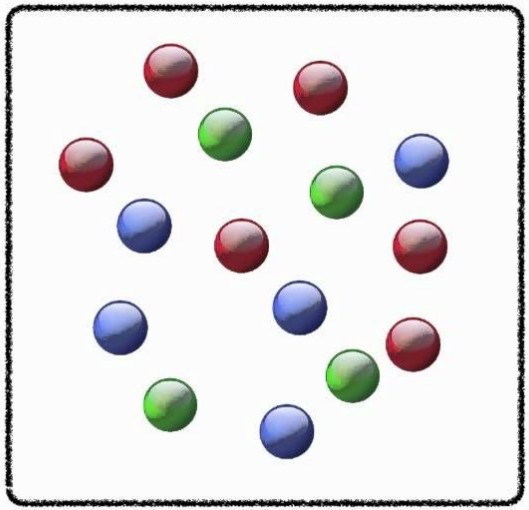
6 4 5 15



$$\text{Probability (Red)} = \frac{\text{Total Red}}{\text{Total}} = \frac{6}{15} = .40$$

or

$$\text{Probability (Green)} = \frac{\text{Total Green}}{\text{Total}} = \frac{4}{15} = .27$$

or

$$\text{Probability (Blue)} = \frac{\text{Total Blue}}{\text{Total}} = \frac{5}{15} = \frac{.33}{1.00}$$

# Chances

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## The probability of an event *not* occurring

The following spinner is spun once:

What is the probability of it landing on the yellow sector?

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

What is the probability of it ***not*** landing on the yellow sector?

$$P(\text{not yellow}) = \frac{3}{4}$$

If the probability of an event occurring is $p$ then the probability of it *not* occurring is $1 - p$.

# Practice set

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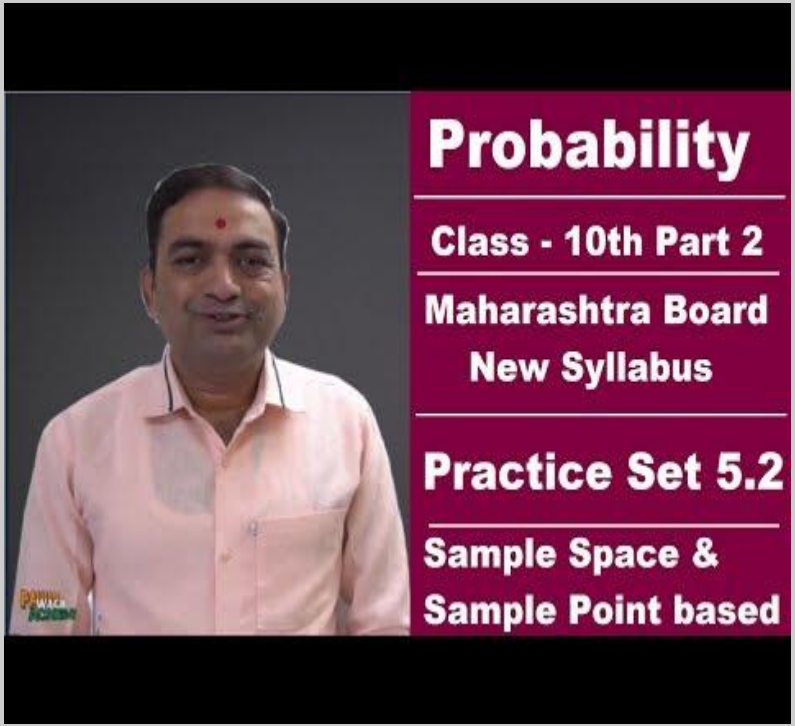
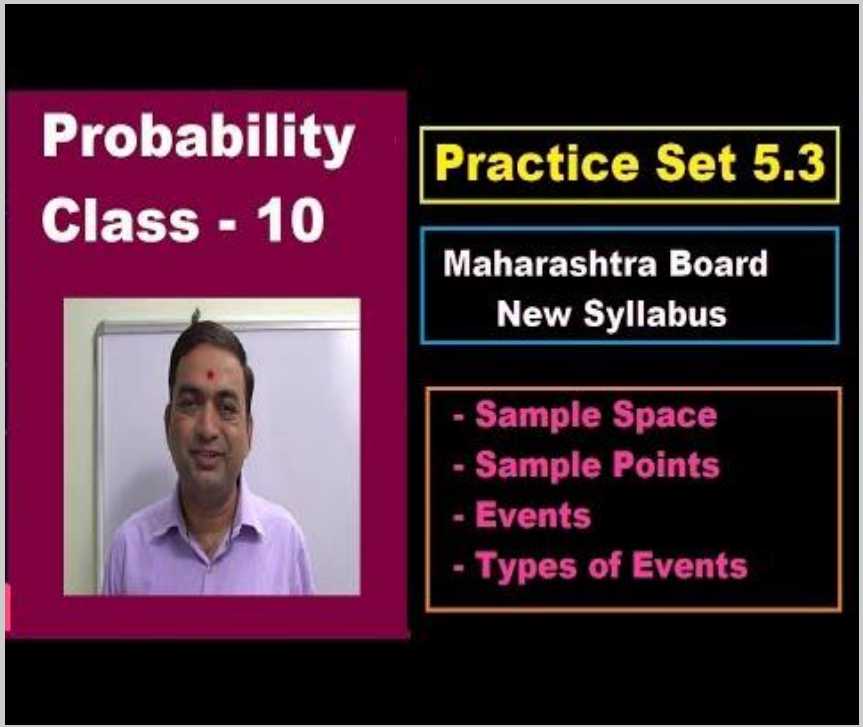


# Engage


Probability
Class - 10
Practice Set 5.3
Maharashtra Board
New Syllabus
- Sample Space
- Sample Points
- Events
- Types of Events

Probability
Practice Set 5.4
Class 10th
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New Syllabus

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Thank you