



UDAAN



2026

Probability

MATHS

LECTURE-3

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Topics *to be covered*

-  Some
More ~~important~~ Questions
-  Case based Questions
-  CBSE 2025 Questions

Abh Sehious ho jaol,



#warmUp

#Q. Statement-1 (A): If the probability of occurrence of an event is 0.7, then the probability of its non-occurrence is 0.3.

Statement-2 (R): For any event A $P(A) + P(\text{not } A) = 1$.

$$P(E) + P(E') = 1$$

$$P(E') = 1 - 0.7$$

$$= 0.3$$

- A** Statement-1 and Statement-2 are True; Statement-2 is a correct explanation for Statement-1.
- B** Statement-1 and Statement-2 are True; Statement-2 is not a correct explanation for Statement-1.
- C** Statement-1 is True, Statement-2 is False.
- D** Statement-1 is False, Statement-2 is True.

#Q. If a number x is chosen at random from the numbers $-2, -1, 0, 1, 2$. What is the probability that $x^2 < 2$?

$$x \in \{-2, -1, 0, 1, 2\}$$

$$P(x^2 < 2) = ?$$

$$P(E) = \frac{\text{no. of favourable outcomes}}{\text{Total no. of outcomes}}$$

$$x^2 \in \{4, 1, 0, 1, 4\}$$

$$P(x^2 < 2) = \frac{3}{5}$$

Percentage probability.

$$\begin{aligned} &= \frac{3}{5} \times 100 \\ &= 60\% \end{aligned}$$

Extra question.

#Q. A number x is selected from the numbers 1, 2, 3 and then a second number y is randomly selected from the numbers 1, 4, 9. What is the probability that the product xy of the two numbers will be less than 9?

$$x \in \{1, 2, 3\}$$

$$y \in \{1, 4, 9\}$$

$$P(xy < 9) = ?$$

Formula

$$P(xy < 9) = \frac{\text{Number of favorable outcomes}}{\text{Total outcomes}}$$

Total outcomes

↓

by a line a product
possible has?

$x \backslash y$	1	2	3	xy
1	1	2	3	1
4	4	8	12	4
9	9	18	27	9

#Q. Two customers are visiting a particular shop in the same week [Monday to Saturday]. Each is equally likely to visit the shop on any one day as on another. What is the probability that both will visit the shop on:

- (i) the same day?
- (ii) different days?
- (iii) consecutive days?

$$(i) \frac{6}{36} = \frac{1}{6}$$

$$(ii) 1 - P(\text{same day})$$

$$= 1 - \frac{1}{6}$$

$$= \frac{5}{6}$$

All possible outcomes:

$\{(M,M), (M,T), (M,W), (M,Th), (M,F), (M,S), (T,M), (T,T), (T,W), (T,Th), (T,F), (T,S), (W,M), (W,T), (W,W), (W,Th), (W,F), (W,S), (Th,M), (Th,T), (Th,W), (Th,Th), (Th,F), (Th,S), (F,M), (F,T), (F,W), (F,Th), (F,F), (F,S), (S,M), (S,T), (S,W), (S,Th), (S,F), (S,S)\}$

Leap years \rightarrow 366 days

February
 29^{th}

non-leap years \rightarrow 365 days

Q Rithu and Poekti are friends. What is the probability that both will have a non-leap year?

(i) the same birthday?

(ii) different birthday?

Total outcomes :- 365×365

$$(i) P(\text{Same birthday}) = \frac{365}{365 \times 365} = \frac{1}{365},$$

$$(ii) P(S.B) + P(D.B) = 1$$

$$P(D.B) = 1 - \frac{1}{365} = \frac{364}{365}$$

#Q. Two friends Anil and Ashraf were born in the December month in the year 2010. Find the probability that :

non-leap
year

365 days

- (i) they share same date of birth.
- (ii) they have different dates of birth.

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H6pu

Total outcomes = 31×31 "

Q Find the probability that a non-leap year contains.

S_3 Sundays.

$$365 \text{ days} = S_2 \text{ weeks} + 1 \text{ day}$$

S_2 Sundays guaranteed.

All possible outcomes =
 $\{M, T, W, Th, F, Sa, Su\}$

$$P(S_3 \text{ sundays}) = \frac{1}{7}$$

Q Find the probability that a leap year contains 53 Sundays.

$$366 \text{ days} = 52 \text{ weeks} + 2 \text{ days}$$

52 Sundays

All possible outcomes =
 $\{(M,T), (T,W), (W,Th), (Th,F),$
 $(F,Sa), (Sa,Su), (Su,M)\}$

$$P(53 \text{ Sundays}) = \frac{2}{7}$$

366 days = 52 weeks + 2 days

52 Sundays

1 week = 7 days

{(M,T), (T,W), (W,Th), (Th,F), (F,Sa)}

$$\frac{2}{7}$$

#Q. Statement-1 (A): The probability that a leap year has 53 Sundays is $2/7$.
Statement-2 (R): The probability that a non-leap year has 53 Sundays is $5/7$.

A Statement-1 and Statement-2 are True; Statement-2 is a correct explanation for Statement-1.

B Statement-1 and Statement-2 are True; Statement-2 is not a correct explanation for Statement-1.

C Statement-1 is True, Statement-2 is False.

D Statement-1 is False, Statement-2 is True.

#Q. In a game of chance consisting of spinning an arrow which comes to rest pointing at one of the numbers 1, 2, 3, ..., 20 (see Fig.) and these are equally likely outcomes. Three persons Aarushi, Avni and Mira decide to play the game. Aarushi wins ₹5000 if the arrow points at an even number. Mira wins ₹8000 when arrow points at an odd number and Avni wins ₹12,000 when arrow points at a prime number.

5000
Aarushi → Even no.
8000
Mira → odd no.
12000
Avni → prime no.



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Based on the above information answer the following questions:

- (i) Total number of possible outcomes in the game is

(a) 10 ✓ (b) 20 (c) 30 (d) 40

(ii) What are the chances of Aarushi winning ₹5000?

✓ (a) 50% (b) 60% (c) 40% (d) 25%

(iii) What are the chances of Mirea winning ₹8000?

(a) 60% (b) 40% ✓ (c) 50% (d) 80%

(iv) What are the chances of Avni winning ₹12000?

(a) 50% (b) 60% (c) 80% ✓ (d) 40%

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$$\frac{7}{20} \times 100 = 35\%$$

(v) What are the chances of Mira and Avni winning their prize money?

- (a) 35% (b) 5% (c) 40% (d) 25%

(vi) What are the chances of Aarushi and Avni winning their prize money?

- (a) 35% (b) 5% (c) 10% (d) 20%

(vii) Chances of all three winning their prizes are?

- (a) 5% (b) 10% (c) 1% (d) 0%

#Q. There is a game of tossing of three coins. The entry fee in the game is ₹200. Shikha takes entry into the game by paying the entry fee. The rules of the game are If by tossing three coins or one coin three times she gets one or two heads entry fee is refunded. If she gets three heads, she receives double the amount paid as entry fee. Otherwise, she loses the entry fee.

All possible outcomes:

{HHH, HHT, HTH, THH,
TTT, TTH, THT, HTT}

A
loses



One or two heads → Refund.

Three heads → 400

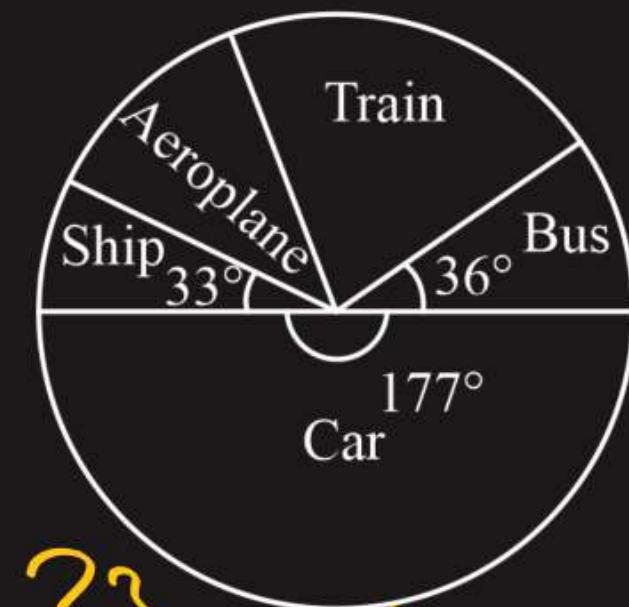
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Based on the above information answer the following questions:

#Q. In a survey on holidays 120 people were asked to state which type of transport they used on their last holiday. the following pie chart shows the results of the survey.

Observe the pie chart and answer the following questions:

- (i) If one person is selected at random, find the probability that he/she travelled by bus or ship. $\frac{23}{120}$
- (ii) Which is most favorite mode of transport and how many people used it? $\text{Car} \rightarrow \frac{177}{360} \times 120 = 59$
- (iii)
 - (a) A person is selected at random, if the probability that he did not use train is $4/5$, find the number of people who used train.
OR
 - (b) The probability that randomly selected person used aeroplane is $7/60$. Find the revenue collected by air company at the rate of 5,000 per person.



$$\begin{aligned}
 &= \frac{7}{60} \times 120 \\
 &= 23
 \end{aligned}$$

#Q. In a survey on holidays 120 people were asked to state which type of transport they used on their last holiday. the following pie chart shows the results of the survey.

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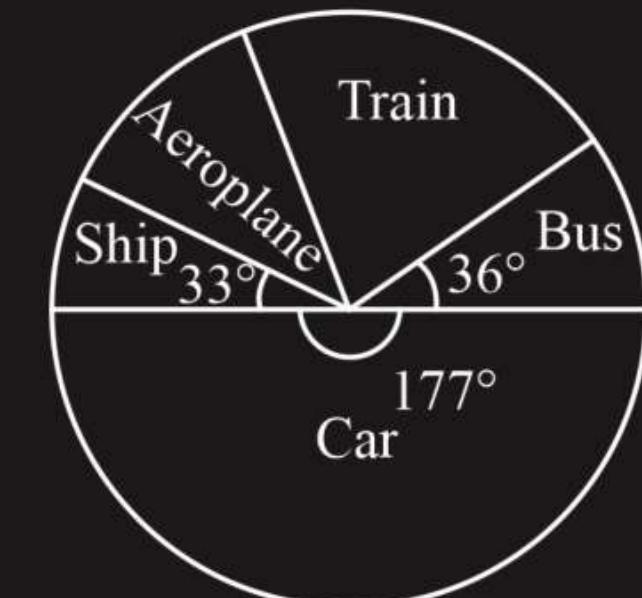
(ii) Which is most favorite mode of transport and how many people used it?

(iii) (a) A person is selected at random, if the probability that he did not use train is $\frac{4}{5}$, find the number of people who used train.

$$P(\text{used train}) = 1 - \frac{4}{5} = \frac{1}{5}$$

OR

(b) The probability that randomly selected person used aeroplane is $\frac{7}{60}$. Find the revenue collected by air company at the rate of 5,000 per person.



$$\frac{x}{120} = \frac{1}{5} \Rightarrow x = 24$$

#Q. "Eight Ball" is a game played on a pool table with 15 balls numbered 1 to 15 and a "cue ball" that is solid and white. Of the 15 numbered balls, eight are solid (non-white) coloured and numbered 1 to 8 and seven are striped balls numbered 9 to 15.

The 15 numbered pool balls (no cue ball) are placed in a large bowl and mixed, then one ball is drawn out at random.



#6Ph

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Based on the above information answer the following questions:

- (i) What is the probability that the drawn ball bears number 8?
- (ii) What is the probability that the drawn ball bears an even number?
- (iii) What is the probability that the drawn ball bears a number, which is a multiple of 3?
- (iv) What is the probability that the drawn ball is a solid coloured and bears an even number?

#GPM

#Q. The number of red balls in a bag is 10 more than the number of black balls. If the probability of drawing a red ball at random from this bag is $\frac{3}{5}$, then the total number of balls in the bag is:

~~#GPlu~~

$$\begin{aligned}B &= x \\R &= 10 + x\end{aligned}$$

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- A 50
- B 60
- C 80
- D 40

R.E \rightarrow Rolling a die

$$P(E_1) = \frac{2}{6} = \left(\frac{1}{3}\right) \quad P(F_2) = \frac{3}{6} = \left(\frac{1}{2}\right)$$



#Q. Assertion (A) : Event E_1 : getting a number less than 3 and Event E_2 : getting a number greater than 3 are complementary events. ~~X~~

Reason (R): If two events E and F are complementary events, then $P(E) + P(F) = 1$.

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- A Both Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of Assertion (A).
→
- B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
- C Assertion (A) is true, but Reason (R) is false.
- D Assertion (A) is false but Reason (R) is true.

#Q. A bag contains balls numbered 2 to 91 such that each ball bears a different number. A ball is drawn at random from the bag. Find the probability that:

- (i) it bears a 2-digit number.
- (ii) it bears a multiple of 1.

Total no. = 90

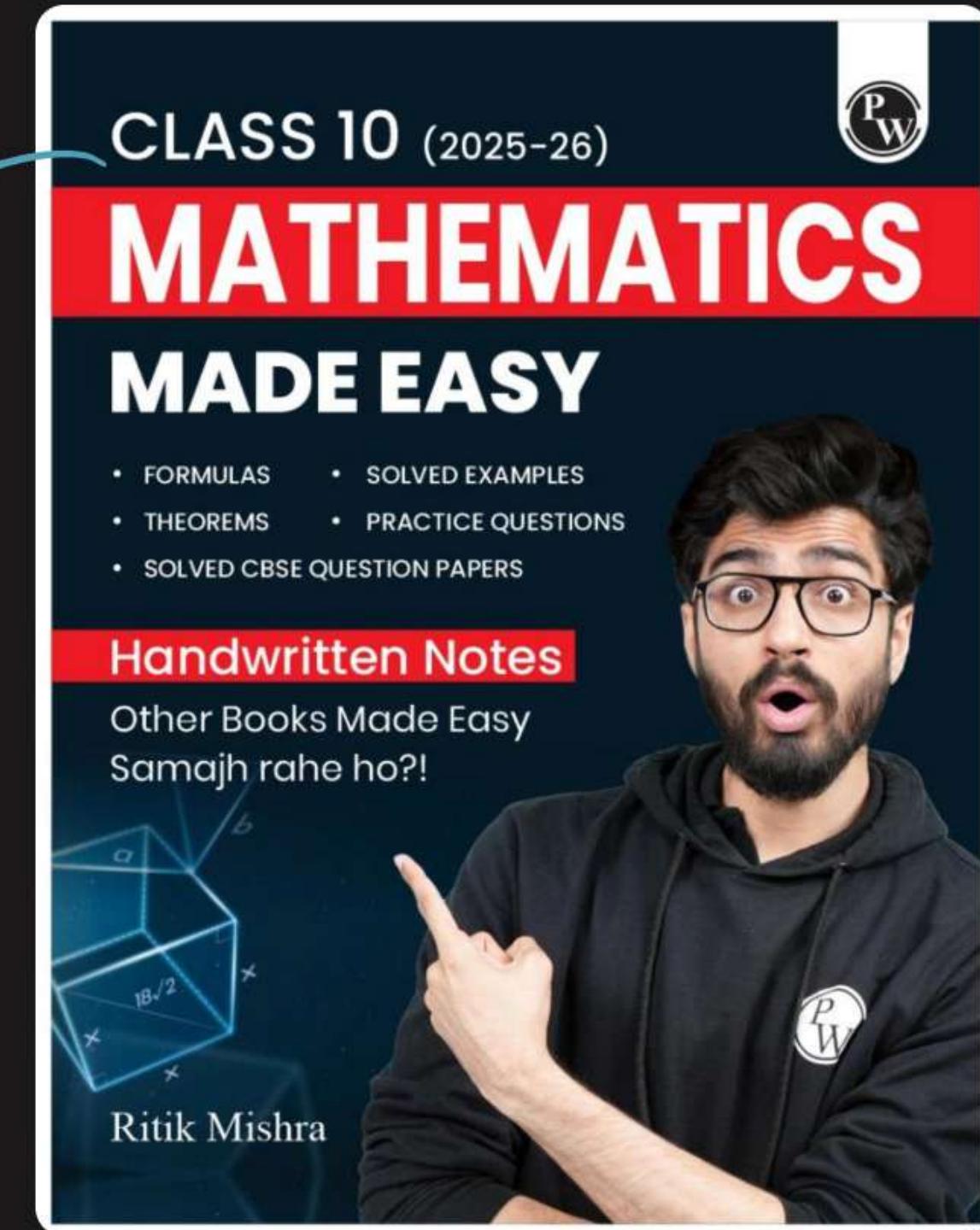
$$\frac{90}{90} - 1$$

#GPU

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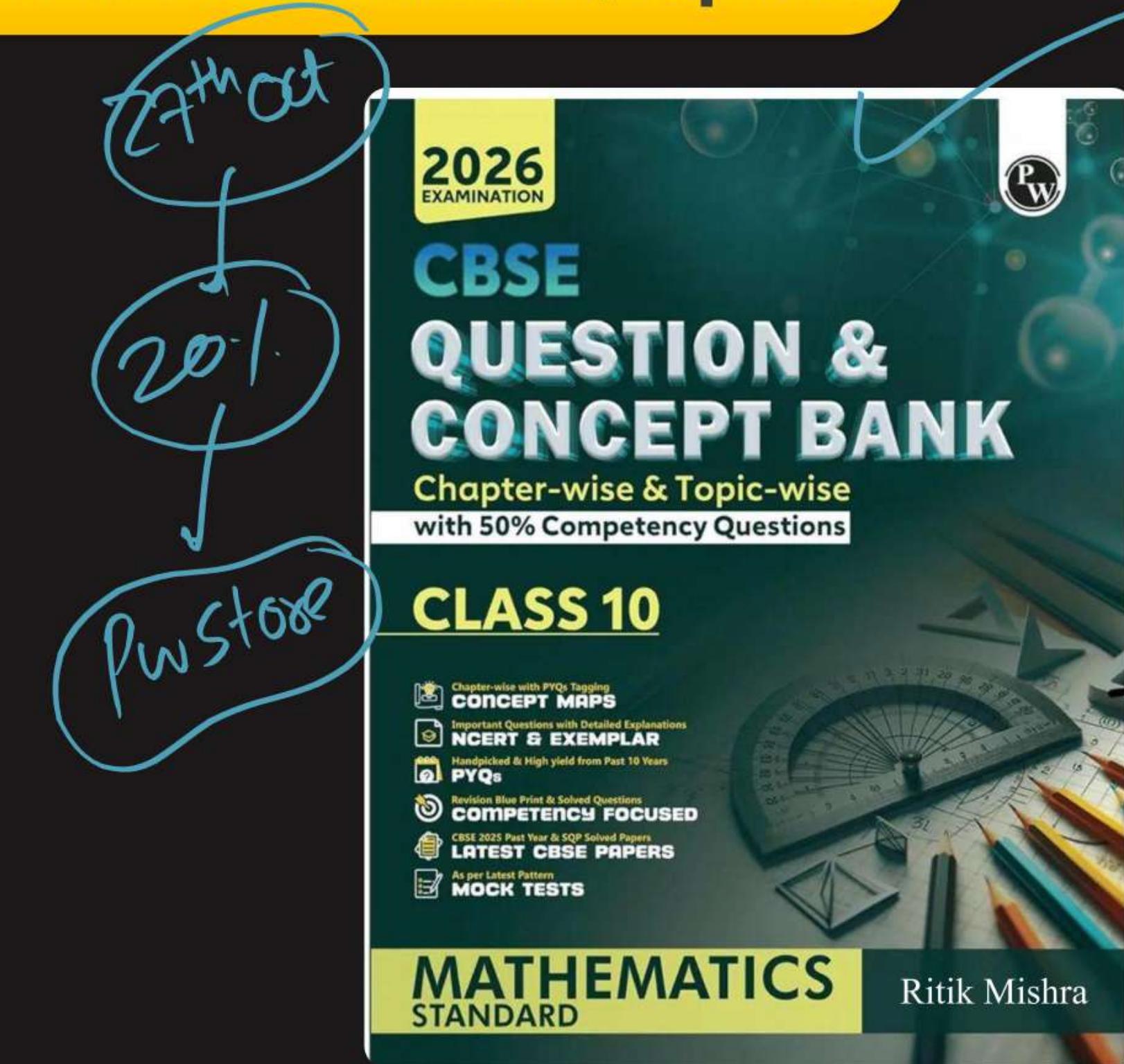
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- ④ → chapters
- Classes → 5, 6
- Ages → ③
- Stats → ③
- Surface → ④



**WORK HARD
DREAM BIG
NEVER GIVE UP**





RITIK SIR

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• Thank you

BABUAS

#mathematics

