



UDAAN



2026

Triangles

MATHS

LECTURE-3

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Topics

to be covered



Recalling Congruency of triangles

Concept of Similarity and Questions //

easy //

#Q. ABCD is a parallelogram, P is a point on side BC and DP when produced meets

AB produced at L. Prove that $\frac{DP}{PL} = \frac{DC}{BL}$.

Given: ABCD is a ||gm.

To prove: $\frac{DP}{PL} = \frac{DC}{BL}$

Proof: $\because AD \parallel BC$
 $\Rightarrow AD \parallel BP$

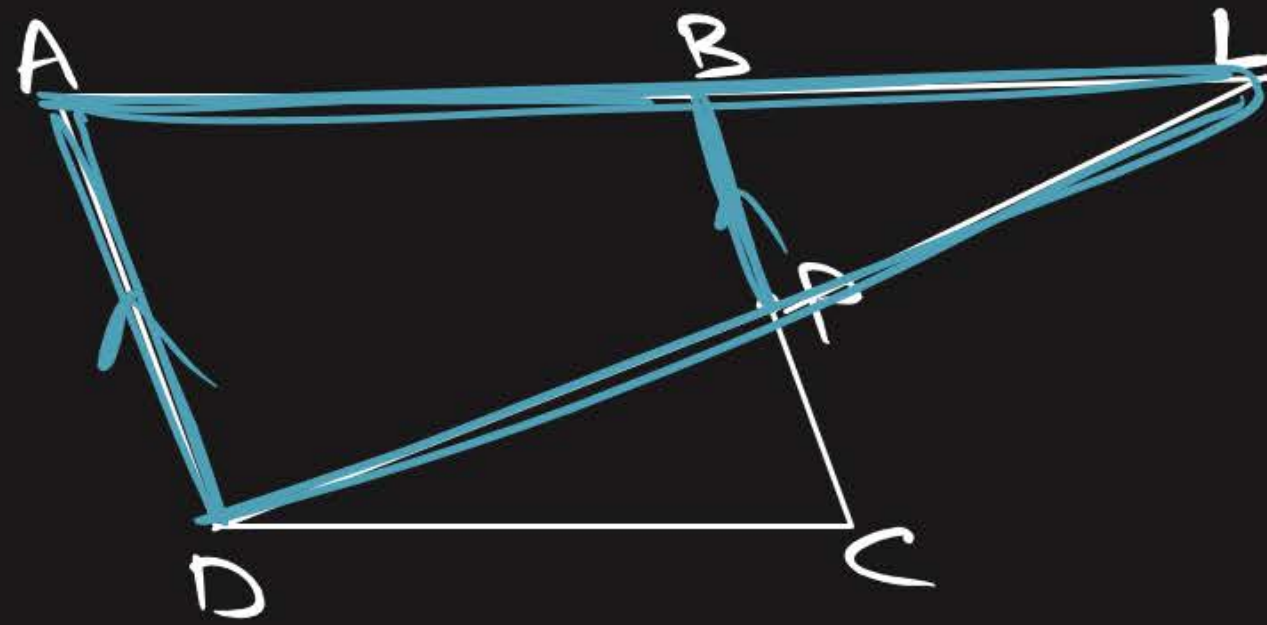
By B.P.T,

$$\frac{DP}{PL} = \frac{AB}{BL}$$

$\because AB = DC$
 (opp. sides of ||gm)

$$\frac{DP}{PL} = \frac{DC}{BL}$$

A.P



Congruent $\begin{cases} \text{shape} \rightarrow \text{equal} \\ \text{size} \rightarrow \text{equal (superimpose)} \end{cases}$



$$\triangle ABC \cong \triangle PQR$$

$$\begin{aligned}
 AB &= PQ \\
 BC &= QR \\
 AC &= PR \\
 \angle A &= \angle P \\
 \angle B &= \angle Q \\
 \angle C &= \angle R
 \end{aligned}$$

//

- ① SAS
- ② SSS
- ③ ASA
- ④ AAS
- ⑤ RHS.

Criteria's



Concept of Similarity

In earlier classes, we have learnt about congruent figures. Two geometric figures having the same shape and size are known as congruent figures. Note that congruent figures are alike in every respect. In this chapter, we shall study about similarity of geometric figures. Geometric figures having the same shape but different sizes are known as similar figures. Two congruent figures are always similar but similar figures need not be congruent as discussed in the following illustrations.

Similar $\begin{cases} \text{Shape} \rightarrow \text{equal} \\ \text{Size} \rightarrow \text{alg-ho sakta hai} \end{cases}$



Illustration – 1

Any two line segments are always similar but they need not be congruent. They are congruent, if their lengths are equal.

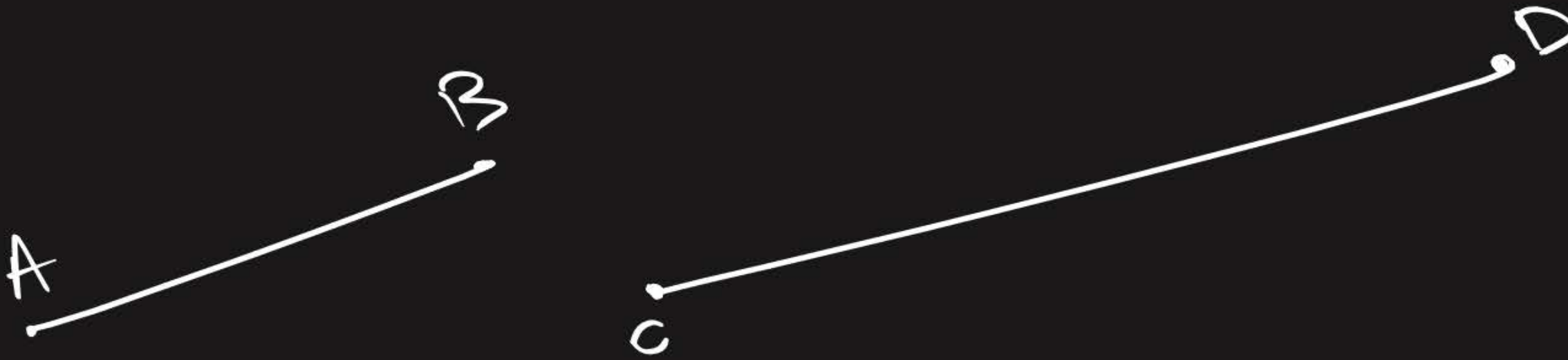
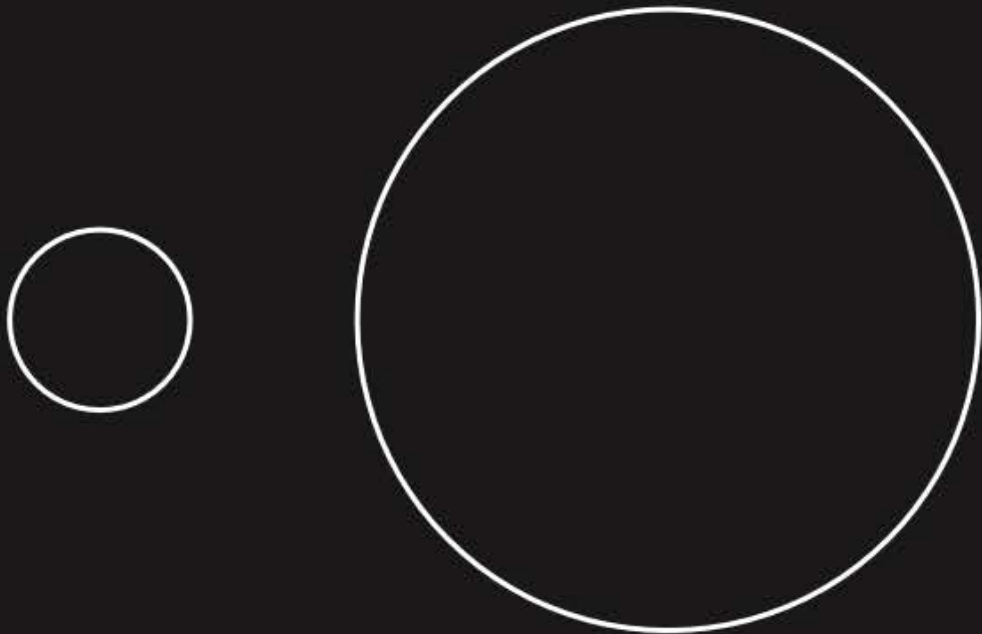




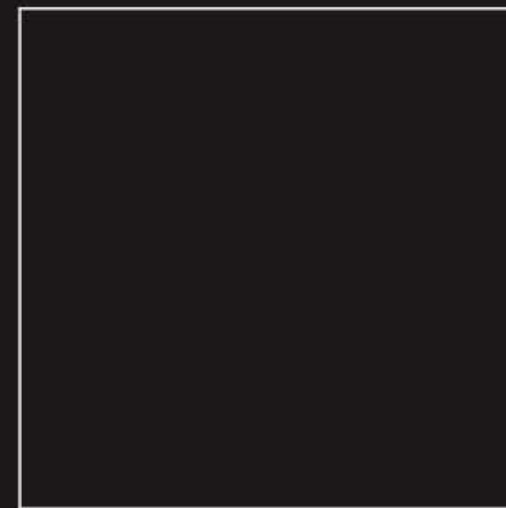
Illustration – 2

Any two circles are similar but not necessarily congruent. They are congruent if their radii are equal.





Any two squares are similar





Any two equilateral triangles are similar

If two figures are similar one can be obtained from the other either by shrinking or by stretching, without changing its shape. There is one-to-one correspondence between the parts of two similar figures.



#Q. All circles and squares are

NCERT Intex

A Congruent

B Similar

C Both (A) and (B)

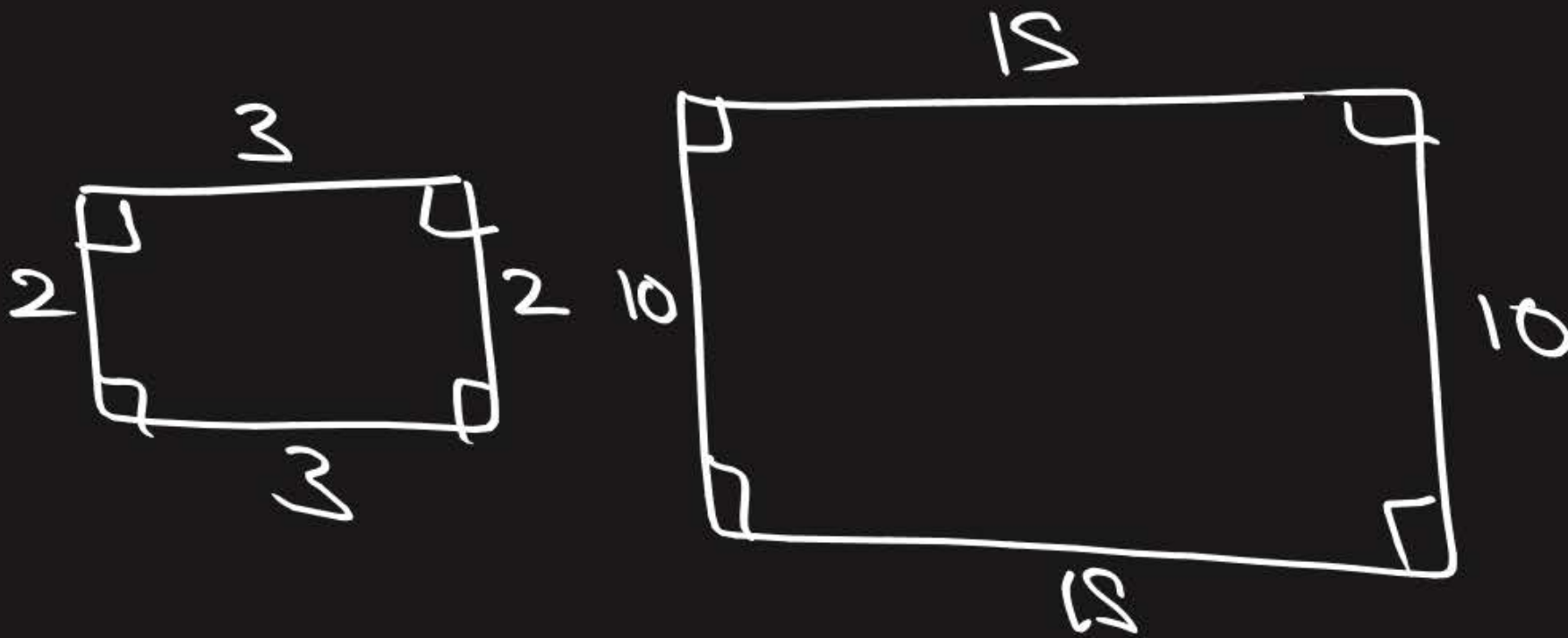
D None of these



Similar Polygons

Definition : Two polygons are said to be similar to each other, if

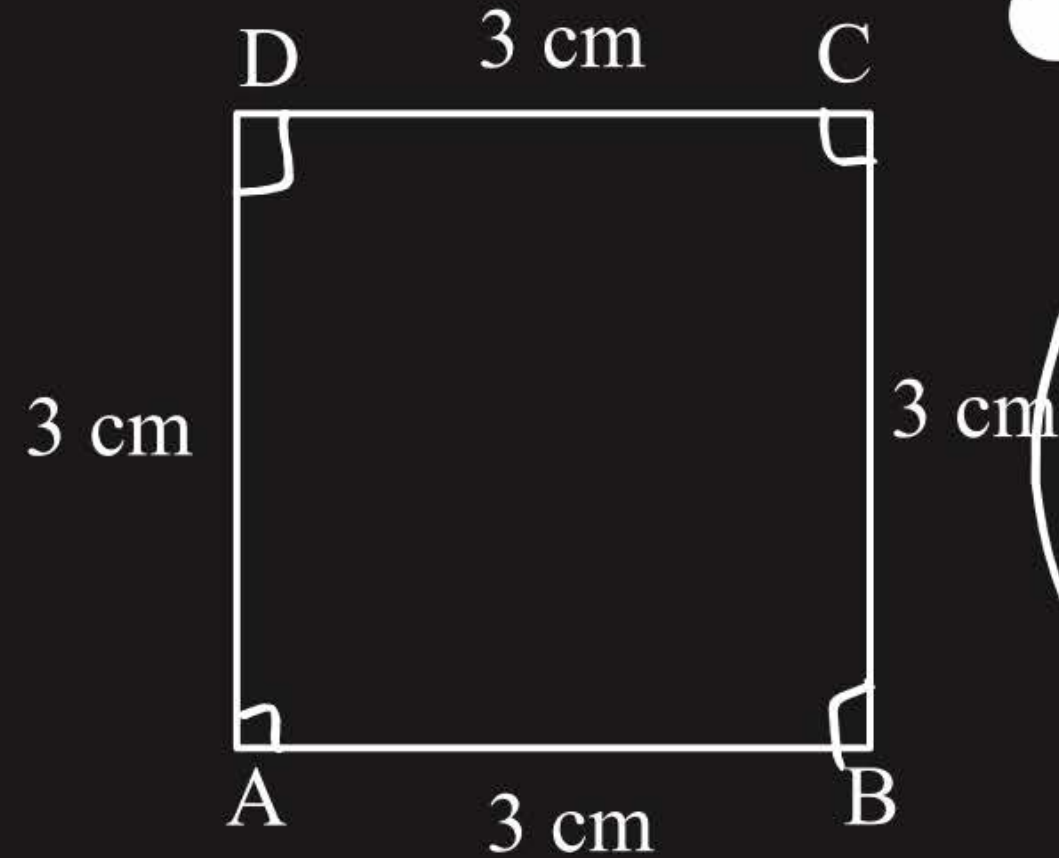
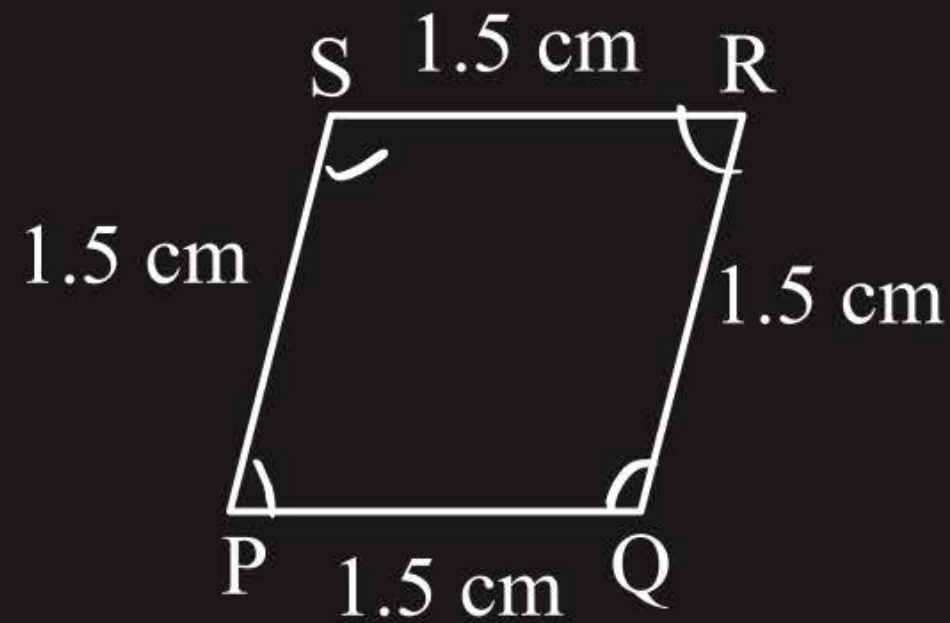
- (i) Their corresponding angles are equal, and
- (ii) The lengths of their corresponding sides are proportional.



$$\frac{3}{15} = \frac{2}{10}$$
$$\frac{1}{5} = \frac{1}{5}$$

#Q. State whether the following quadrilaterals are similar or not:

$$\frac{1}{2} = \frac{1}{2} = \frac{1}{2} = \frac{1}{2}$$



NCERT Index

Not Similar

Similarity of Triangles

If two Δ 's are similar,
then - - -

$$\Delta ABC \sim \Delta PQR$$

$$\angle A = \angle P$$

$$\angle B = \angle Q$$

$$\angle C = \angle R$$

$$\frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR}$$

① SAS

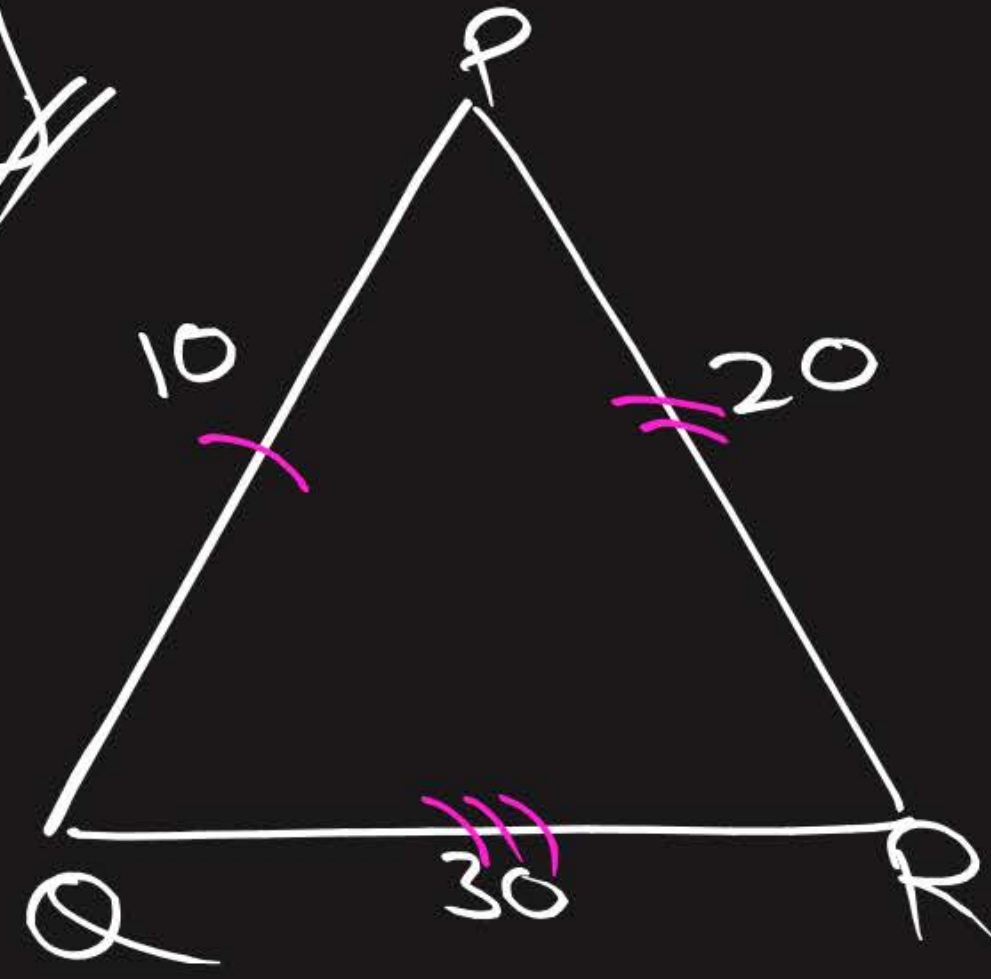
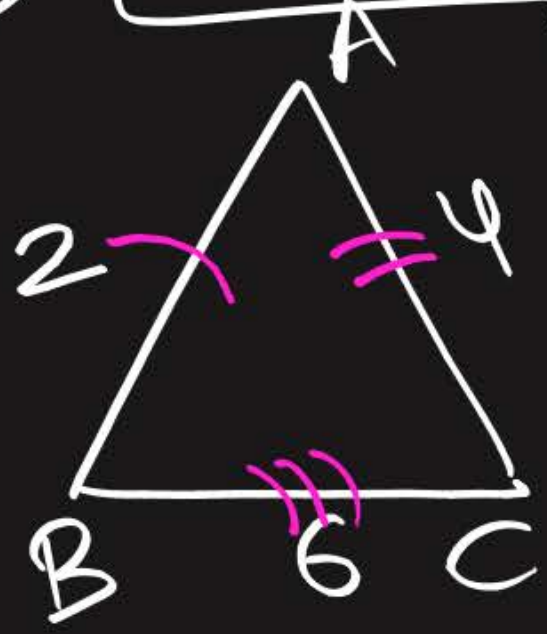
② SSS

③ AAA (AA)

→ proofs
Recorded

↑
upload

① SSS



$$\frac{2}{10} \quad \frac{4}{20} \quad \frac{6}{30}$$

$$\frac{1}{5} = \frac{1}{5} = \frac{1}{5}$$

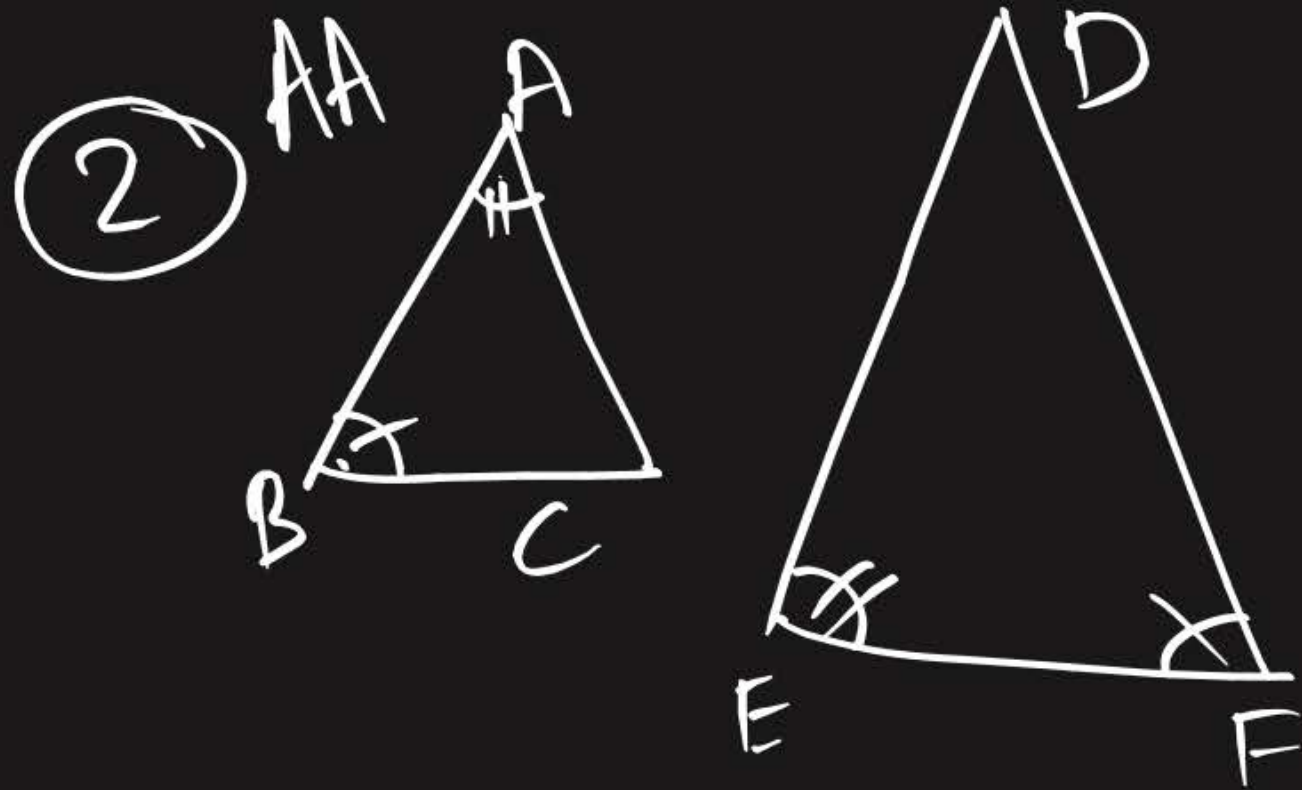
$$\frac{AB}{PQ} = \frac{AC}{PR} = \frac{BC}{QR}$$

$$\Delta ACB \sim \Delta PRQ$$

pattern

By CPST,

$$\begin{aligned} \angle A &= \angle P \\ \angle C &= \angle R \\ \angle B &= \angle Q \end{aligned}$$



By AA,

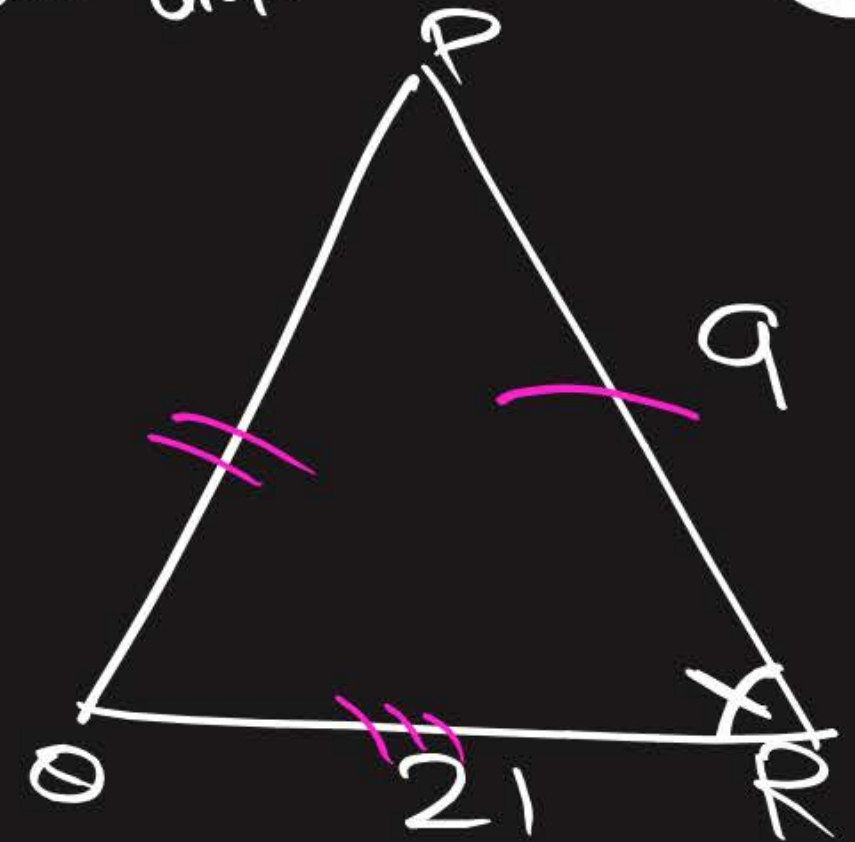
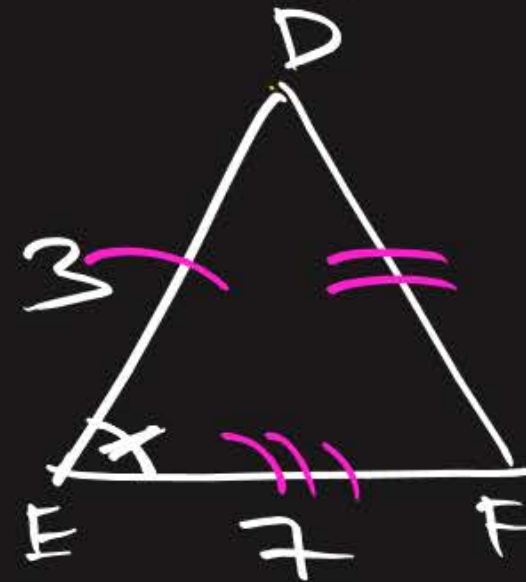
$$\triangle ABC \sim \triangle DEF$$

By CPST,

$$\angle C = \angle D$$

$$\frac{CA}{DE} = \frac{AB}{EF} = \frac{CB}{DF}$$

③ SAS.
Included angle



$$\frac{3}{2} = \frac{3}{2}$$

$$\frac{DE}{PQ} = \frac{EF}{QR}$$

$$\angle E = \angle Q$$

SAS

$$\triangle DEF \sim \triangle PQR$$

By CPST,

$$\angle D = \angle P, \angle F = \angle R$$

$$\frac{DF}{PR} = \frac{FE}{QR} = \frac{DE}{PQ}$$





Criteria of Similarity of Similar Triangles

Let $\triangle ABC$ and $\triangle DEF$ be two given triangles

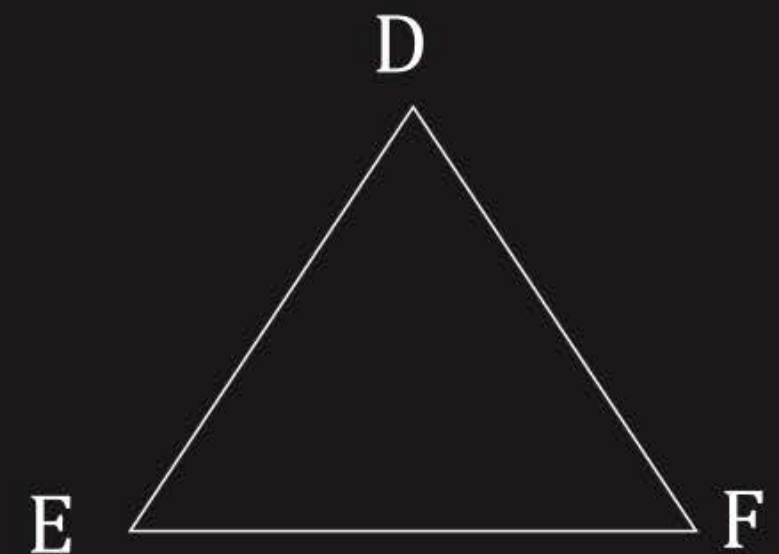
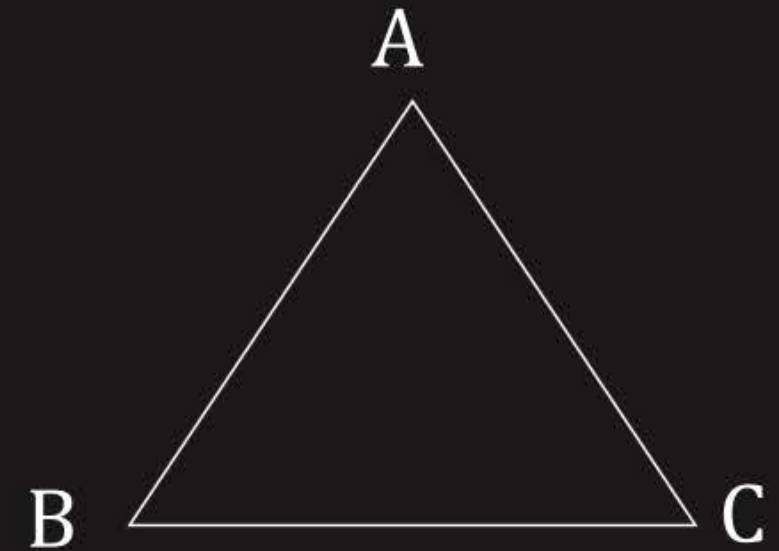
$\triangle ABC$ will be similar to $\triangle DEF$ (i.e. $\triangle ABC \sim \triangle DEF$). If any one of the following conditions holds good.

(a) When the corresponding angles are equal

i.e. $\angle A = \angle D$; $\angle B = \angle E$; $\angle C = \angle F$,

then the triangles are said to be similar by

AAA similarity.





Criteria of Similarity of Similar Triangles

(b) When two angles are equal

i.e. $\angle A = \angle D$; $\angle B = \angle E$,

then the triangles are said to be similar by AA similarity.

(c) When the corresponding sides are proportional

i.e., $\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$,

then the triangles are said to be similar by SSS similarity.



Criteria of Similarity of Similar Triangles

(d) When any two corresponding sides are proportional and the included angles are equal

$$\text{i.e. } \frac{AB}{DE} = \frac{AC}{DF} \text{ and } \angle A = \angle D,$$

then the triangles are said to be similar by SAS similarity.

#Q. If $\triangle ABC \sim \triangle EDF$, then which of the following is not true?

$$\frac{AB}{ED} = \frac{BC}{DF} = \frac{AC}{EF}$$

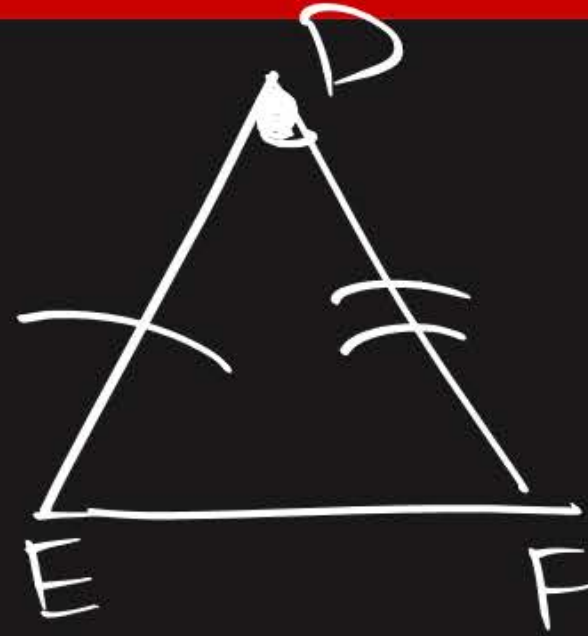
A $BC \cdot EF = AC \cdot FD$

B $AB \cdot EF = AC \cdot DE$

C $BC \cdot DE = AB \cdot EF$

D $BC \cdot DE = AB \cdot FD$

#Q. If in $\triangle ABC$ and $\triangle DEF$, $\frac{AB}{DE} = \frac{BC}{FD}$, then they will be similar, when



A $\angle B = \angle E$

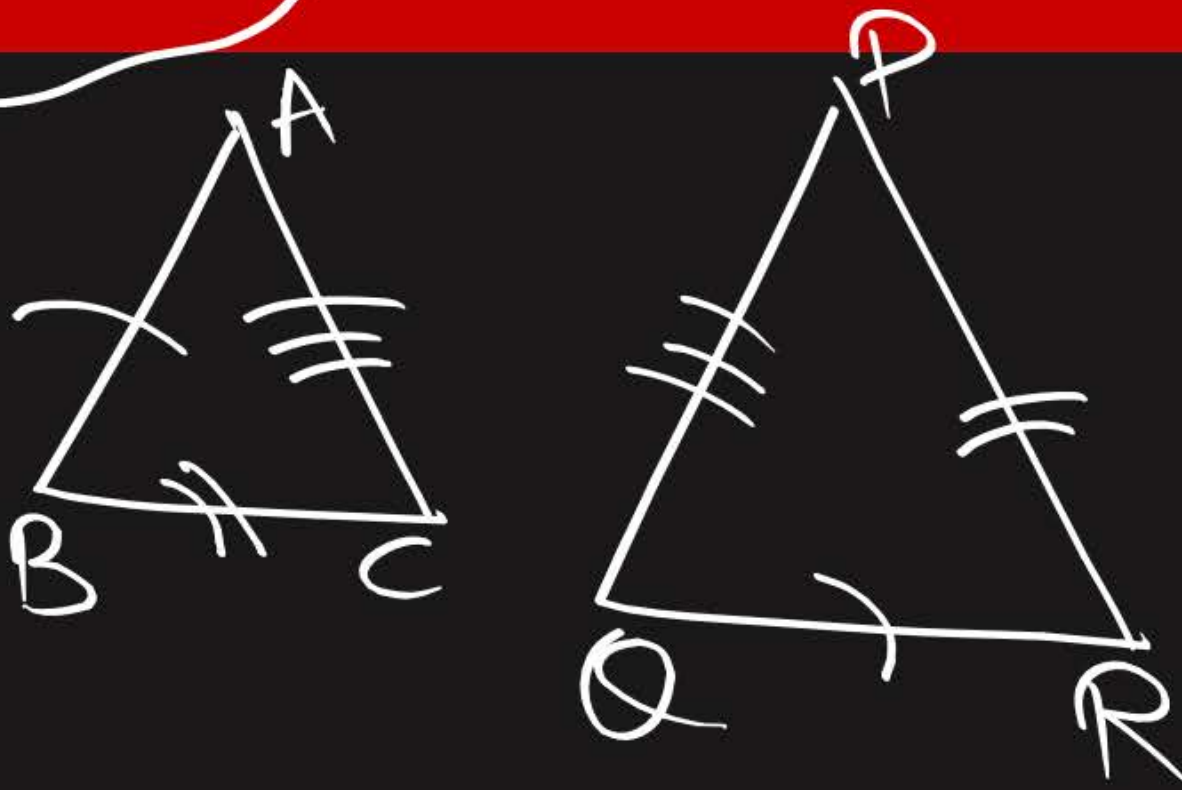
B $\angle A = \angle D$

C $\angle B = \angle D$

D $\angle A = \angle F$



#Q. If in two triangles ABC and PQR, then $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$.



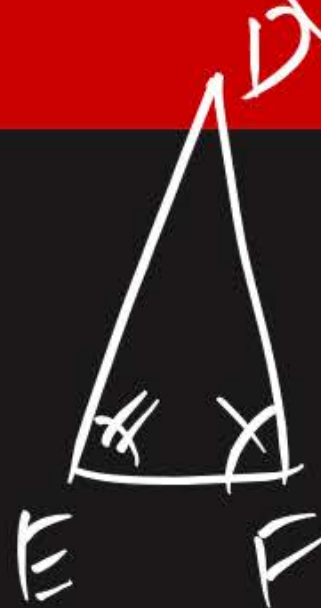
NCERT Exemplar

SSS

- A** $\Delta PQR \sim \Delta CAB$
- B** $\Delta PQR \sim \Delta ABC$ \times
- C** $\Delta CBA \sim \Delta PQR$ \times
- D** $\Delta BCA \sim \Delta PQR$ \times

#Q. In $\triangle ABC$ and $\triangle DEF$, $\angle F = \angle C$, $\angle B = \angle E$ and $AB = \frac{1}{2} DE$. Then the two triangles are

~~AA~~



CBSE 2021

- A** Congruent, but not similar
- B** Similar, but not congruent
- C** Neither congruent nor similar
- D** Congruent as well as similar

#Q. If in two triangles DEF and PQR, $\angle D = \angle Q$ and $\angle R = \angle E$, then which of the following is not true?

NCERT Exemplar

AA

A $\frac{EF}{PR} = \frac{DF}{PQ}$

C $\frac{DE}{QR} = \frac{DF}{PQ}$

~~**B** $\frac{DE}{PQ} = \frac{FE}{RP}$~~

~~**D** $\frac{EF}{RP} = \frac{DF}{QR}$~~

$$\triangle DEF \sim \triangle QRP$$

CPST $\frac{DE}{QR} = \frac{EF}{RP} = \frac{DF}{QP}$

#Q. If is given that $\triangle ABC \sim \triangle DFE$, $\angle A = 30^\circ$ $\angle C = 50^\circ$, $AB = 5$ cm, $AC = 8$ cm and $DF = 7.5$ cm. Then, which of the following is true?

NCERT Exemplar

#GAPK

A $DE = 12$ cm, $\angle F = 50^\circ$

B $DE = 12$ cm, $\angle F = 100^\circ$

C $EF = 12$ cm, $\angle D = 100^\circ$

D $EF = 12$ cm, $\angle D = 30^\circ$

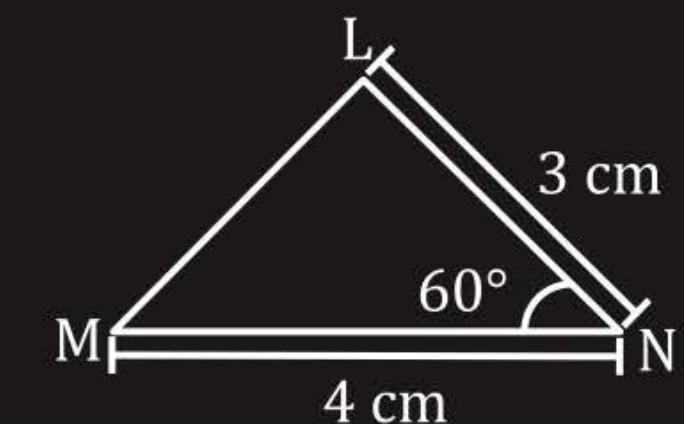
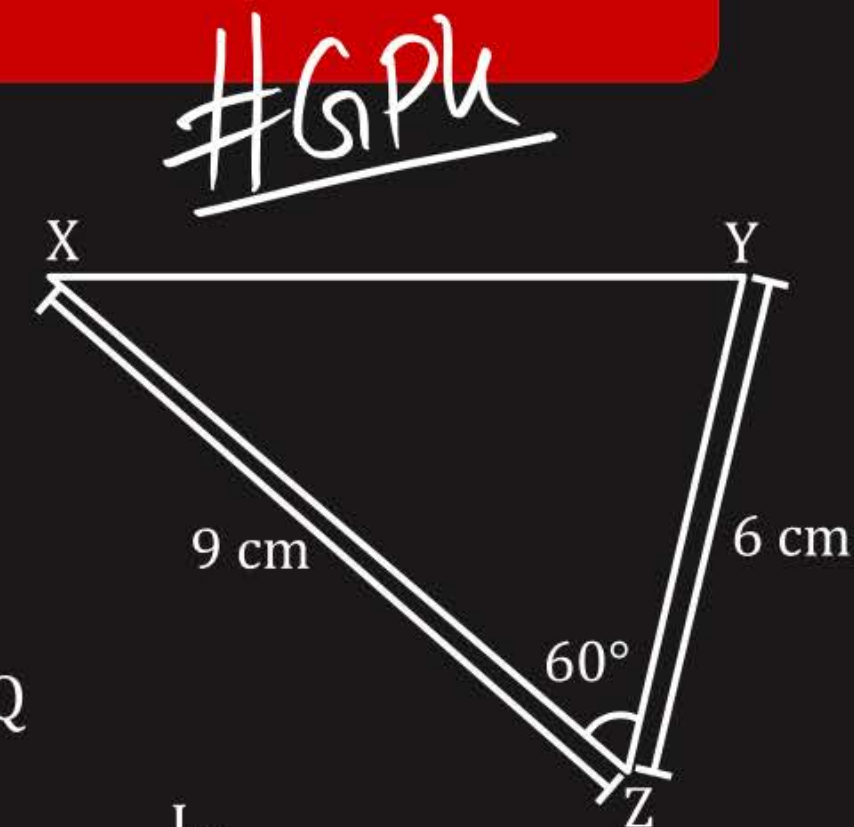
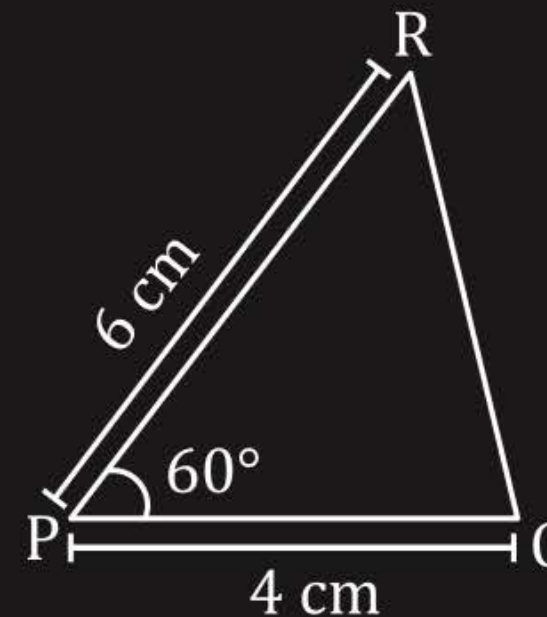
#Q. Show below are three triangles. The measure of two adjacent sides and included angle are given for each triangle. Which of these triangles are similar?

A $\triangle RPQ$ and $\triangle XZY$

B $\triangle RPQ$ and $\triangle MNL$

C $\triangle XZY$ and $\triangle MNL$

D $\triangle RPQ$, $\triangle XZY$ and $\triangle MNL$ are similar to one another





08:53

0

XP 0

38

YOUR BATCH

Post Purchase Journey

All Classes

All Tests

My Doubts

Community

Preparation Meter

Saarthi

Khazana

Pitara

Show more

Upcoming Events (0)

View Schedule

No upcoming events,
Perfect time to catch up on pending work!

My Study Zone

My Batches

My Downloads

Dashbo

Study

Offline

Batches

PW Store

08:51

35%

Notifications

Lakshya Power Ba...

Mark All Read

OLDER

PW Team

16 Sep

Dear Power Batch Students, Alternating Current :
DPP 02 Battleground has been scheduled at 10:20
PM And Haloalkanes and Haloarenes : DPP 14 Bat...

PW Team

16 Sep

Dear Power Batch Students, This is to inform you
that you must submit your subjective paper (in PDF
format) using the Google Form link provided belo...

PW Team

15 Sep

Dear Power Batch Students, Kindly check the Test
Paper and Answer key for Milestone Test - 03 in the
Notice section of your batch. Keep Studying!

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DPP 01 Battleground has been scheduled at 10:20
PM And Haloalkanes and Haloarenes : DPP 13 Batt...

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Dear Power Batch Students, This is to inform you
that CBSE Board Sample Test Paper & Answer Key
for Set 02 of all subjects will be available at 11:00 ...

PW Team

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Hi, Vinamra Goyal

View profile

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Dark Mode

New Study Page

Offline

Scholarship

Test Series

PW Store

Power Batch

MIP

New

DISHA

New

PW Books App

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Online Degree

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Library

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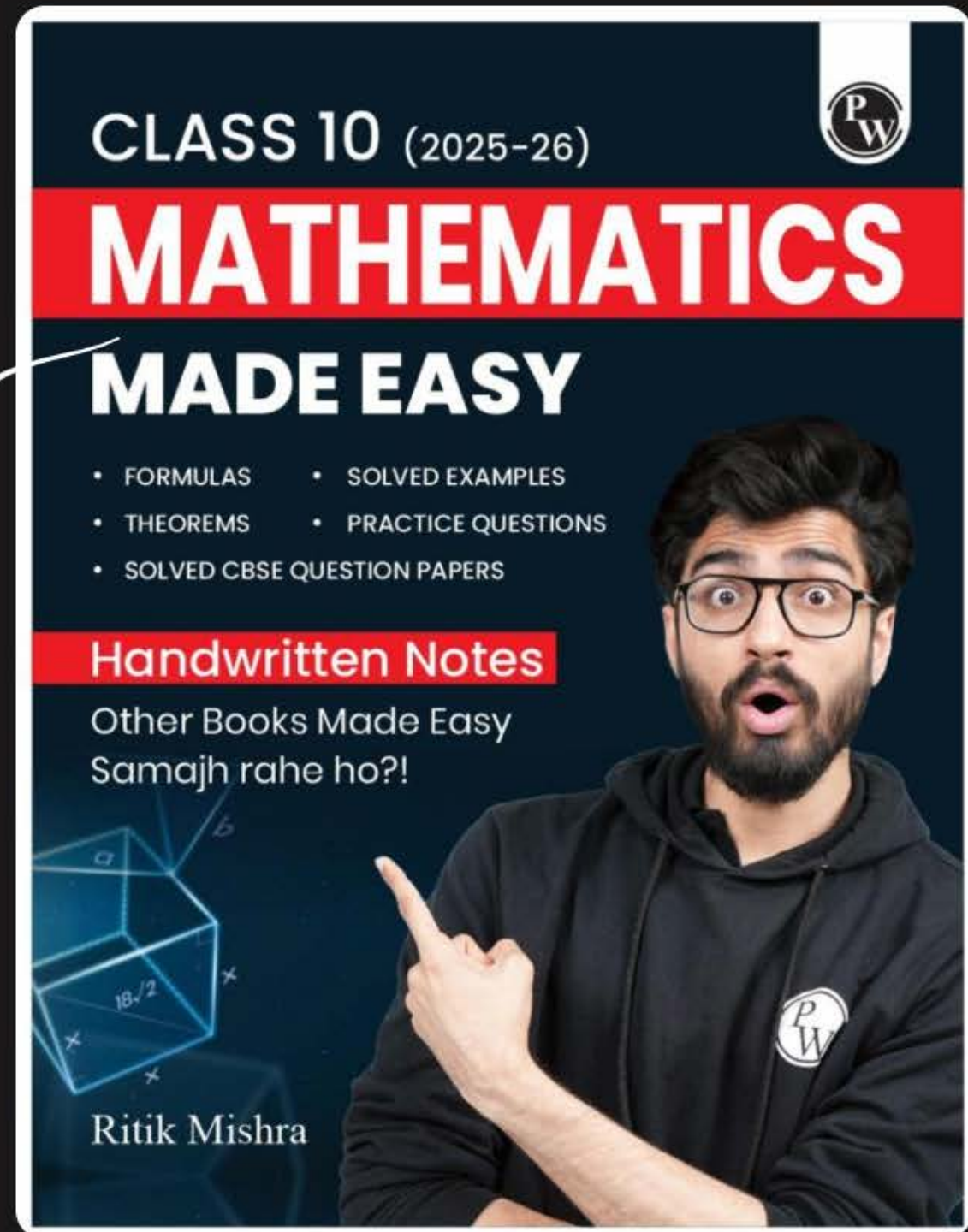
Community

Pitara

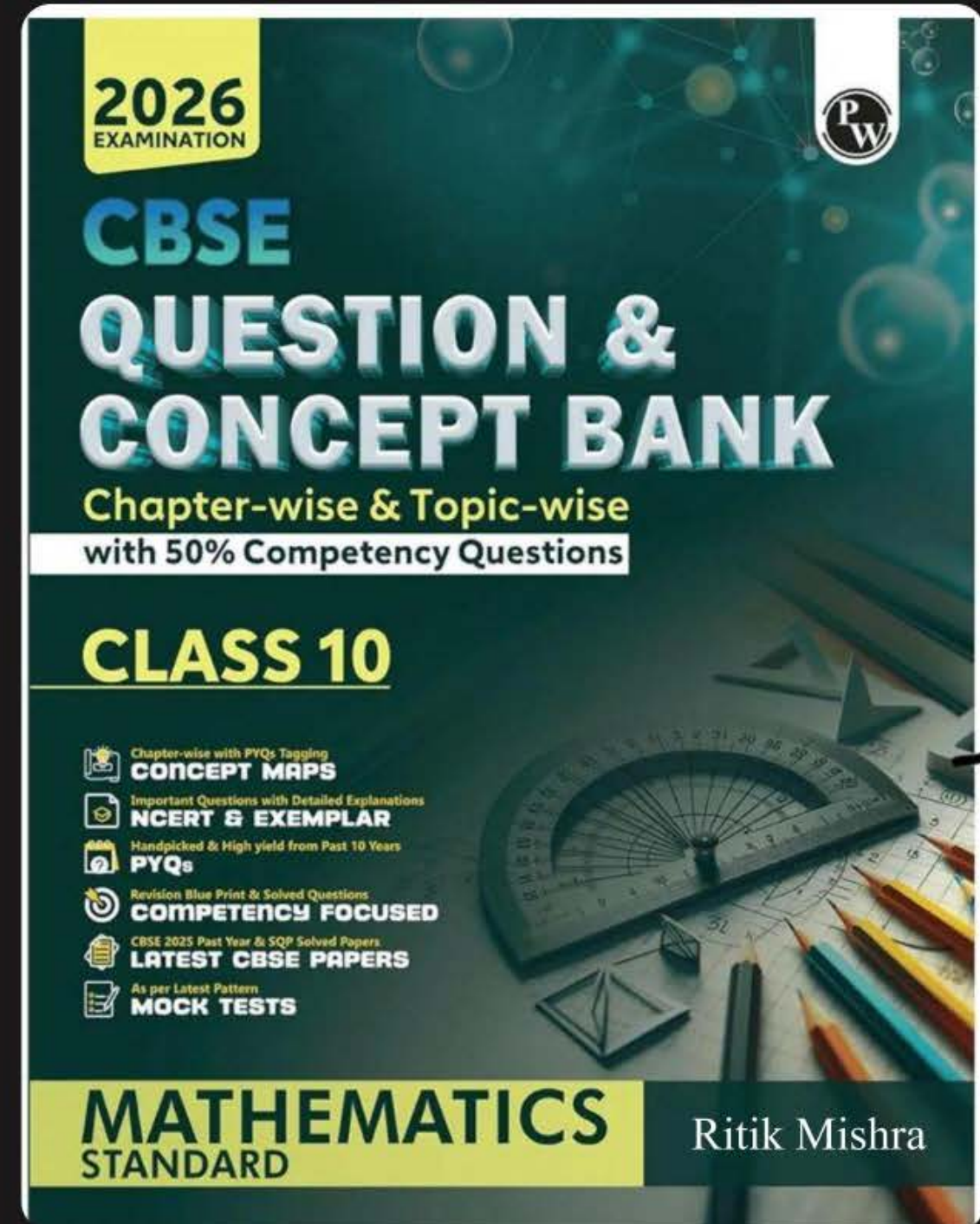
work!

PW Store

Available on PW Store, Amazon, Flipkart



Available on PW Store, Amazon, Flipkart





WORK HARD

DREAM BIG

NEVER GIVE UP



RITIK SIR

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Thank You Babuaas ❤️👥



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Dream Big
Never Give Up**