UDAAN

2026

#Aakhiri class

Triangles

MATHS LECTURE-7

BY-RITIK SIR

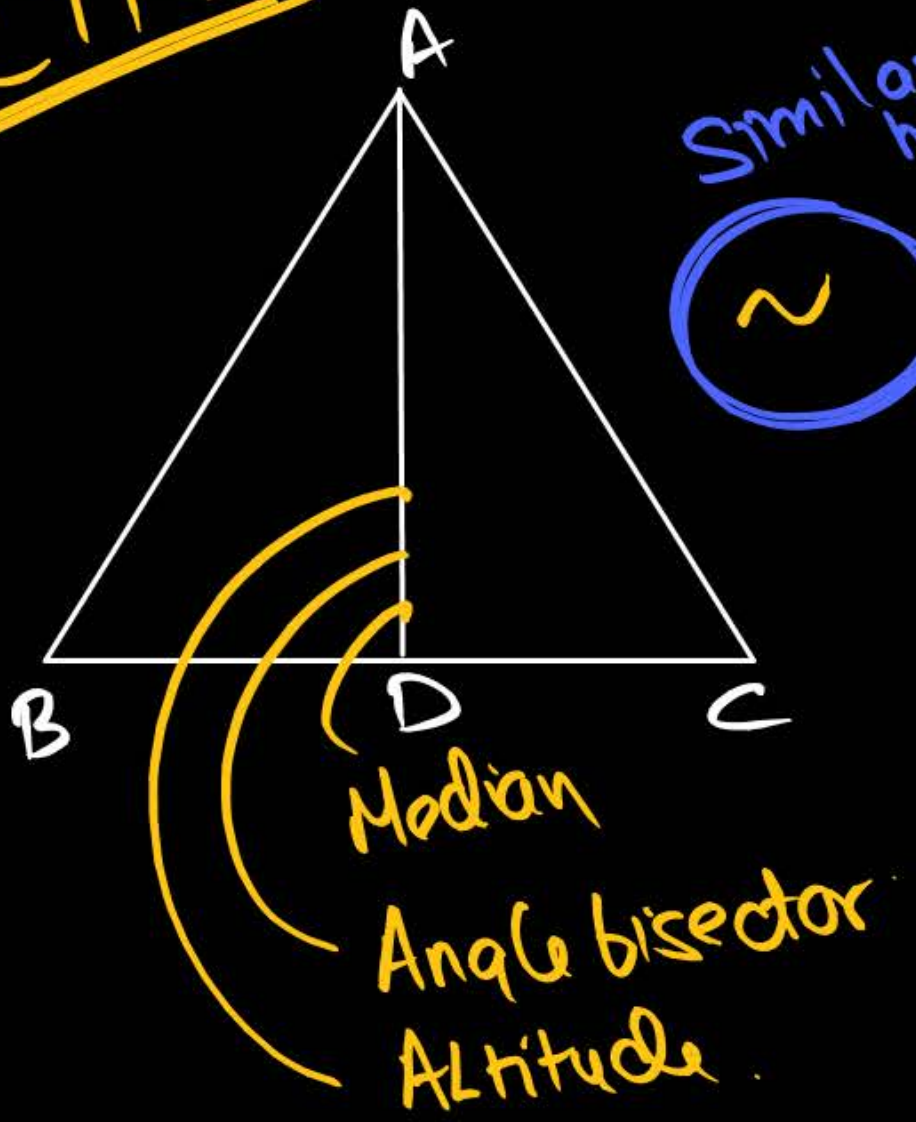
Topics *to be covered*

A. Practice Questions (Part - 03)

B. CBSE 2025 Questions

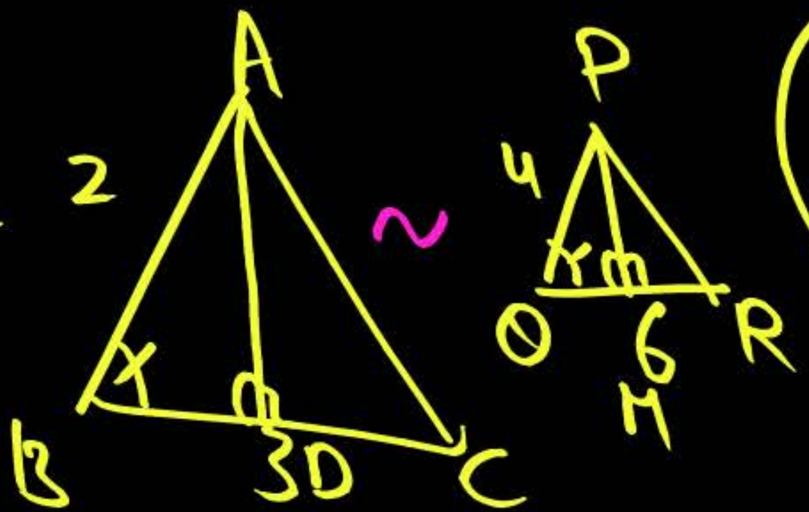
discussion

#CTR

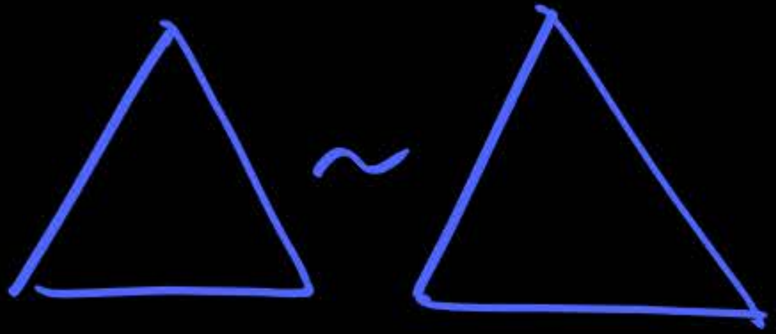


Similar hona zaroori $\sim$

$$\boxed{\frac{AB}{PQ} = \frac{AC}{PR} = \frac{BC}{QR} = \frac{AD}{PM} = \frac{P.\Delta ABC}{P.\Delta PQR}}$$

Q. 

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

Q. 

Corresponding side Ratio = 2:5

" Median " = 2:5

" Altitude " = 2:5

" Angle bisector " = 2:5

Important Points

If two triangles are equiangular / similar, the ratio of the corresponding side is same as the ratio of the:

- Corresponding, medians.
- Corresponding and angle bisects segments.
- Corresponding altitude.
- Perimeter.

#Q. The perimeters of two similar triangles are 30 cm and 20 cm, respectively. If one side of the first triangle is 9 cm long, find the length of the corresponding side of the second triangle.

$\triangle ABC \sim \triangle PQR$ — 20cm

P = 30cm

let AB = 9cm.

Corresponding side of AB = PQ.

$$\frac{P \cdot \triangle ABC}{P \cdot \triangle PQR} = \frac{AB}{PQ}$$

$$\frac{3\cancel{0}}{2\cancel{0}} = \frac{9}{PQ}$$

$$\boxed{PQ = 6cm}$$

#Q. A vertical pole of a length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.

$\angle PRQ = \angle ACB$

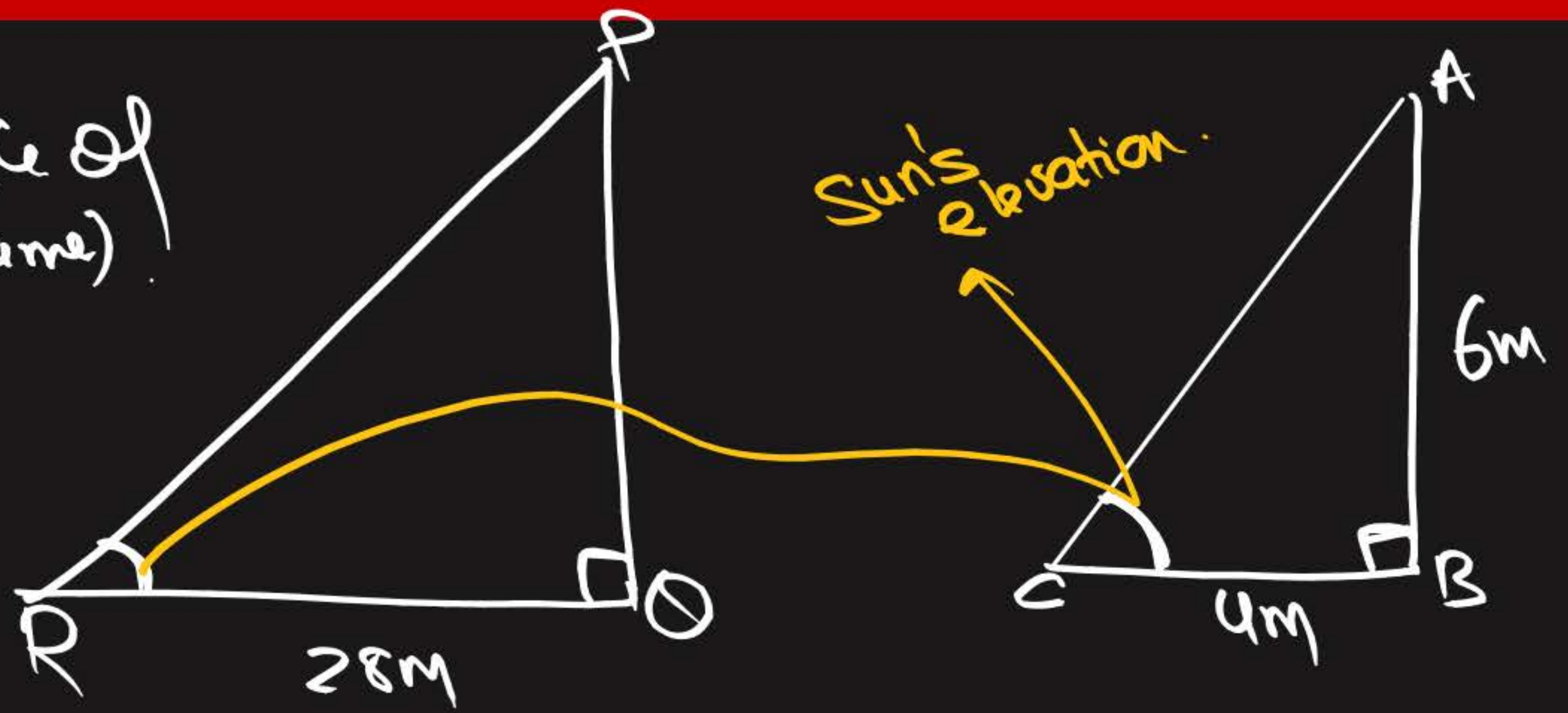
(At the same time, angle of elevation of sun is same)

$\angle PQR = \angle ABC = 90^\circ$

AA

$\Delta PQR \sim \Delta ABC$

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



$PQ = \frac{\overset{7}{\cancel{28}} \times 6}{\cancel{4}}$

$\boxed{PQ = 42m}$

#Q. ABCD is a trapezium such that BC||AD and AD = 4 cm. If the diagonals AC and BD intersects at O such that $\frac{AO}{OC} = \frac{DO}{OB} = \frac{1}{2}$ then BC =

A) 7 cm

B) 8 cm

C) 9 cm

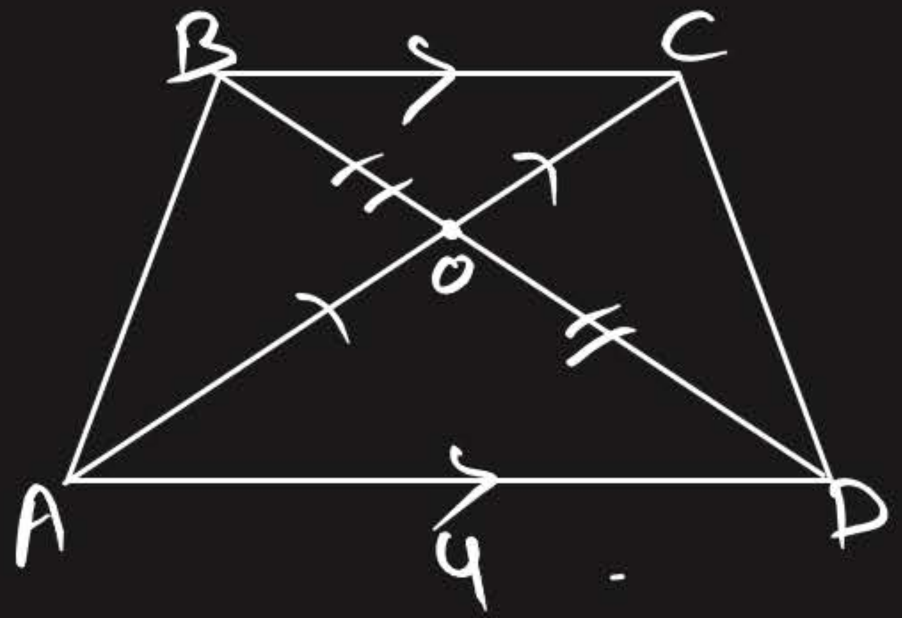
D) 6 cm

$\Delta AOD \sim \Delta COB$

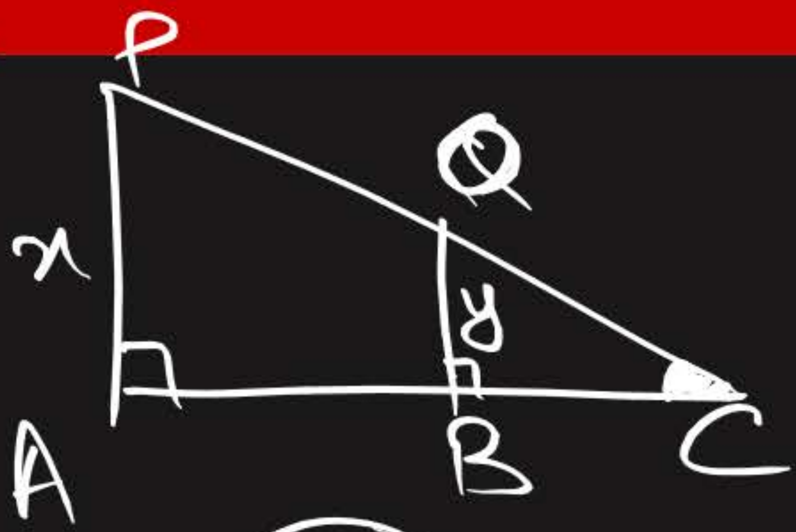
$\frac{AO}{CO} = \frac{OD}{OB} = \frac{AD}{CB}$

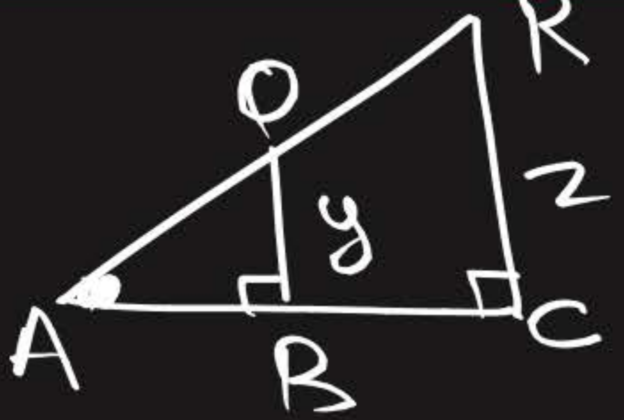
$\frac{1}{2} = \frac{4}{CB}$

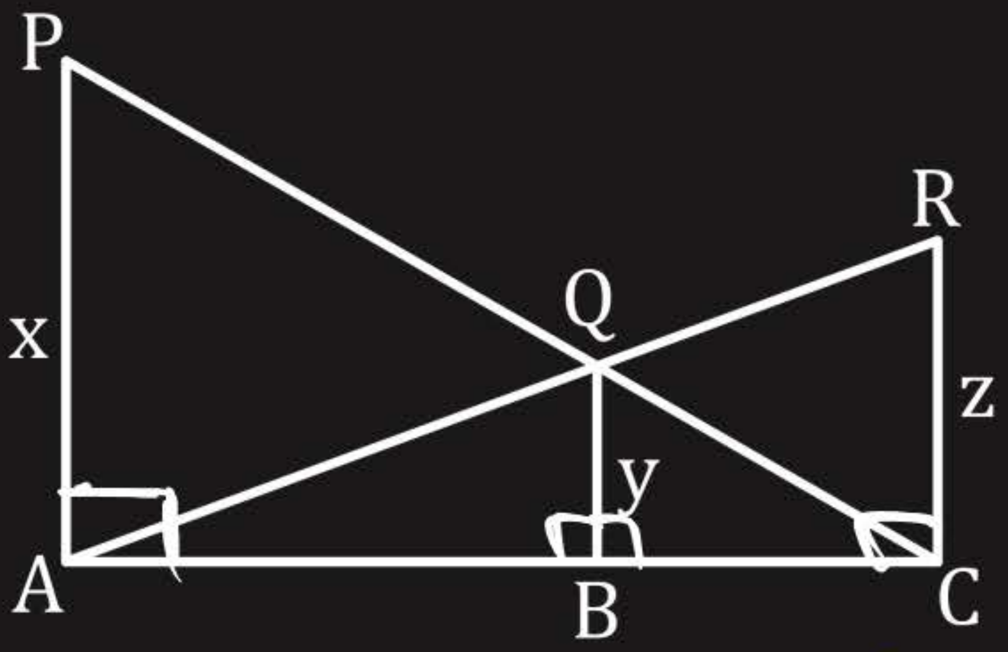
$CB = 8$



#Q. In figure, PA, QB and RC are each perpendicular to AC. Prove that $\frac{1}{x}+\frac{1}{z}=\frac{1}{y}$.







AA

$\Delta APC \sim \Delta BQC$

$$\frac{AP}{BQ}=\frac{PC}{QC}=\frac{AC}{BC}$$

$$\boxed{\frac{x}{y}=\frac{PC}{QC}=\frac{AC}{BC}}$$

$\Delta RCA \sim \Delta QBA$

$$\frac{RC}{QB}=\frac{CA}{BA}=\frac{RA}{QA}$$

$$\boxed{\frac{z}{y}=\frac{CA}{BA}=\frac{RA}{QA}}$$

$$\frac{x}{y}=\frac{AC}{BC} \qquad \frac{z}{y}=\frac{CA}{BA}$$

$$\boxed{\frac{y}{x}=\frac{BC}{AC}} \quad (1) \qquad \boxed{\frac{y}{z}=\frac{BA}{AC}} \quad (2)$$

(1) + (2)

$$\frac{y}{x}+\frac{y}{z}=\frac{BC}{AC}+\frac{BA}{AC}$$

$$\frac{y}{x}+\frac{y}{z}=\frac{BC+BA}{AC} \quad AC$$

$$\frac{y}{x}+\frac{y}{z}=1$$

$$\boxed{\frac{1}{x}+\frac{1}{z}=\frac{1}{y}}$$

#Q. In fig. OB is perpendicular bisector of the line segment DE, FA $\perp$ OB and FE intersect OB at the point C. Prove that

$$\frac{OA}{OB} = \frac{AC}{BC}$$

$\Delta FCA \sim \Delta ECB$

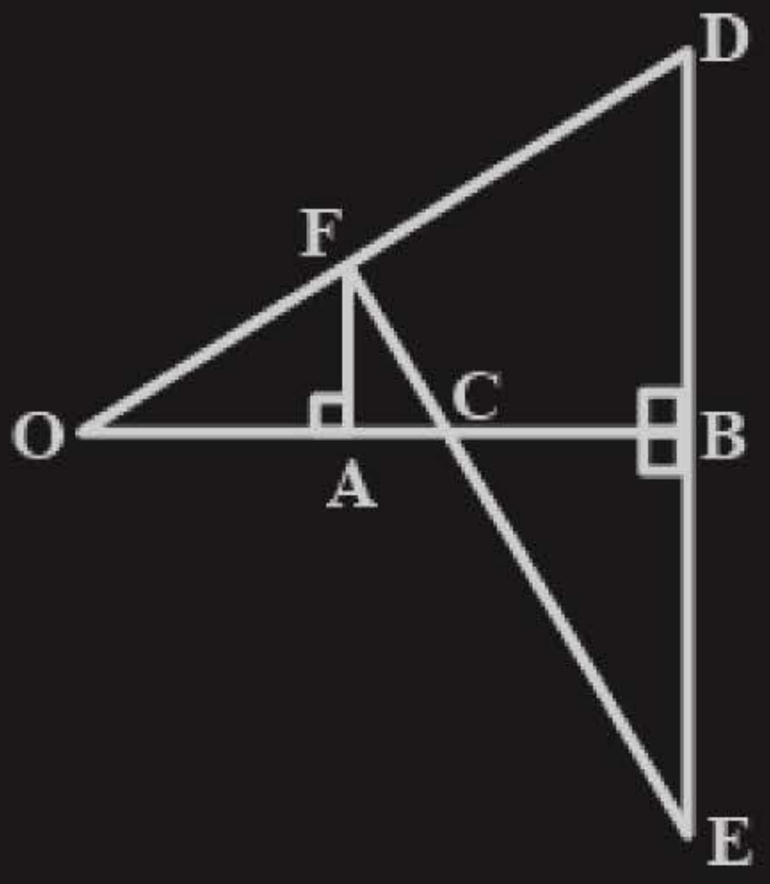
$$\boxed{\frac{FC}{EC} = \frac{CA}{CB} = \frac{FA}{EB}} \quad (1)$$

$\Delta OBD \sim \Delta OAF$

$$\boxed{\frac{OB}{OA} = \frac{BD}{AF} = \frac{OD}{OF}}$$

$$\frac{OA}{OB} = \frac{AF}{BD}$$

$$\boxed{\frac{OA}{OB} = \frac{AF}{BE}} \quad (2)$$



From (1) and (2)

$$\frac{CA}{CB} = \frac{OA}{OB}$$

#Q. Prove that : $\frac{1}{OA}+\frac{1}{OB}=\frac{2}{OC}$

$$\frac{OA}{OB}=\frac{AC}{BC}$$

$$\frac{OA}{OB}=\frac{OC-OA}{OB-OC}$$

$$OA\cdot OB-OA\cdot OC=OB\cdot OC-OA\cdot OB$$

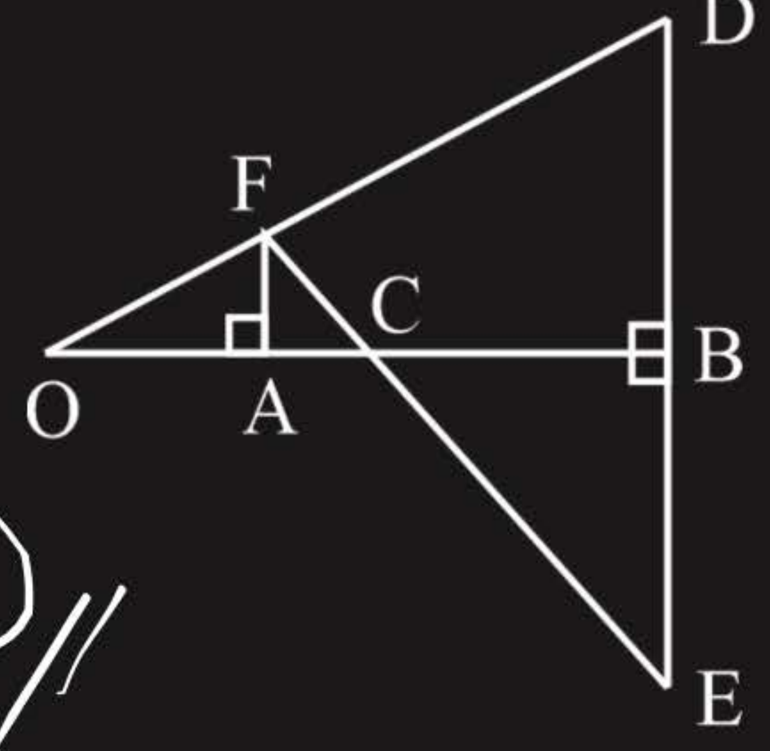
$$OA\cdot OB+OA\cdot OB=OB\cdot OC+OA\cdot OC$$

$$2\,OA\,OB=OB\cdot OC+OA\cdot OC.$$

$$2=\frac{\cancel{OB}\cdot OC}{OA\cdot\cancel{OB}}+\frac{\cancel{OA}\cdot OC}{\cancel{OA}\cdot OB}$$

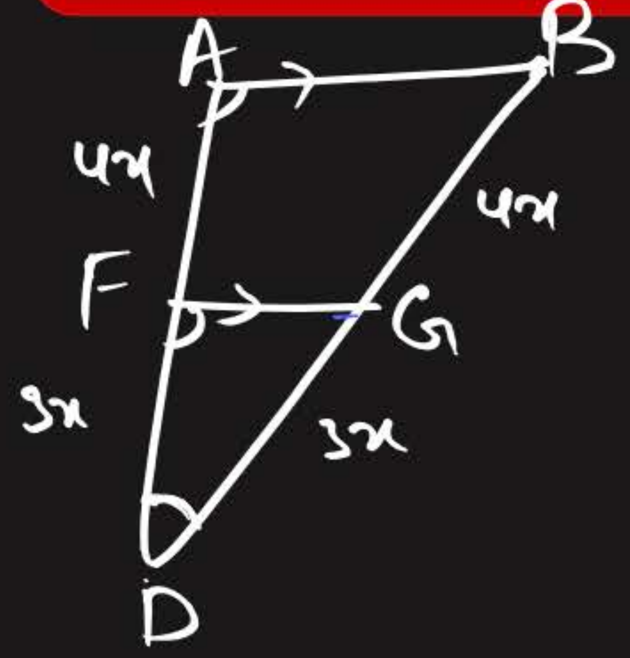
$$2=\frac{OC}{OA}+\frac{OC}{OB}$$

$$\frac{2}{OC}=\frac{1}{OA}+\frac{1}{OB}$$



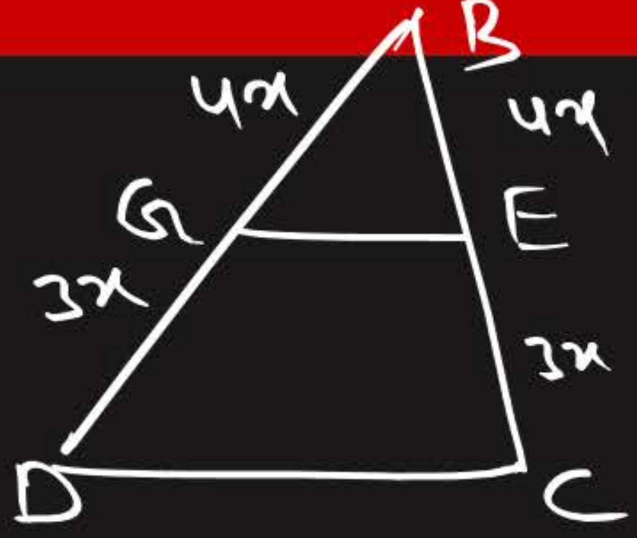
#QT #Dhaasu

#Q. In a trapezium ABCD, AB||DC and DC = 2AB. If EF||AB, where E and F lie on BC and AD respectively such that $\frac{BE}{EC} = \frac{4}{3}$. Diagonal DB intersect EF at G. Prove that, 7EF = 11AB.



$$\frac{FG}{AB} = \frac{DG}{DB}$$

$$\boxed{\frac{FG}{AB} = \frac{3\cancel{x}}{7\cancel{x}}} \quad (1)$$



$$\frac{GE}{DC} = \frac{BE}{BC}$$

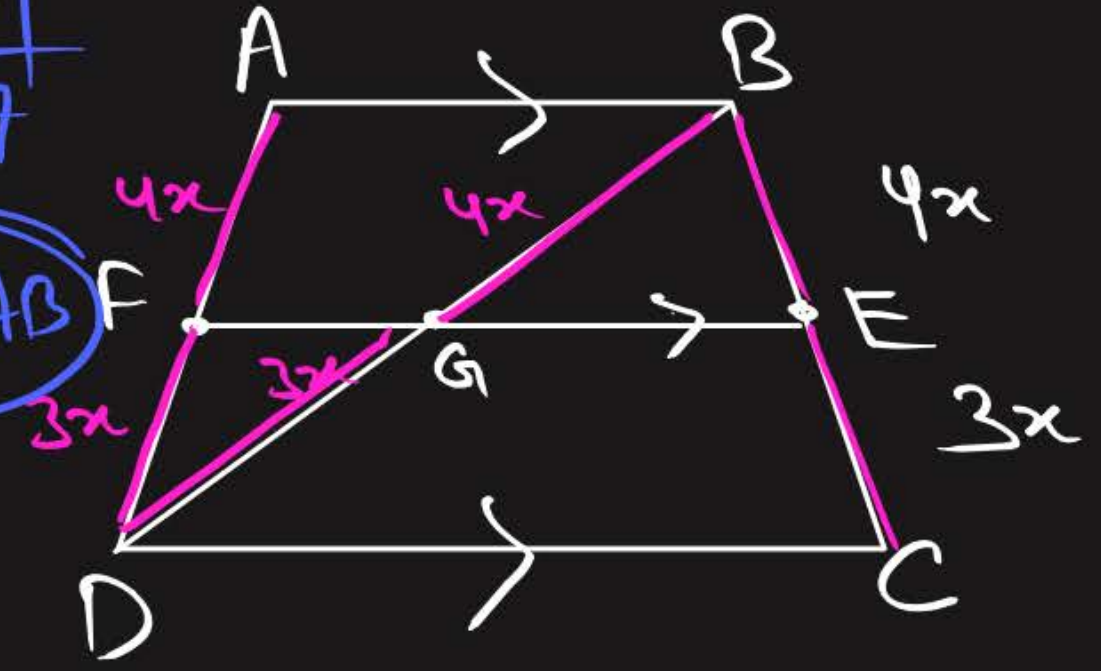
$$\frac{GE}{2AB} = \frac{4\cancel{x}}{7\cancel{x}}$$

$$\boxed{\frac{GE}{AB} = \frac{8}{7}} \quad (2)$$

(1) + (2)

$$\frac{EF}{AB} = \frac{11}{7}$$

$$7EF = 11AB$$



#Q. Sides AB and BE of a right triangle, right angled at B are of lengths 16 cm and 8 cm respectively. The length of the side of largest square FDGB the can be inscribed in the triangle ABE is

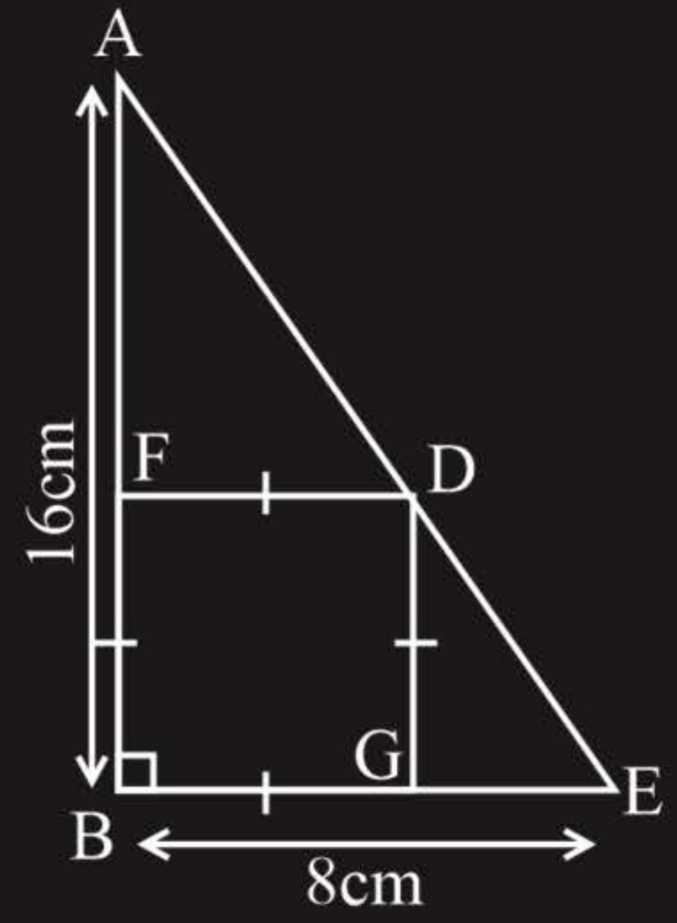
#Gpk

A. 32/3 cm

B. 16/3 cm

C. 8/3 cm

D. 4/3 cm



#Q. In figure, $\angle ACB = \angle CDA$, $AC = 8$ cm $AD = 3$ cm, then $BD =$

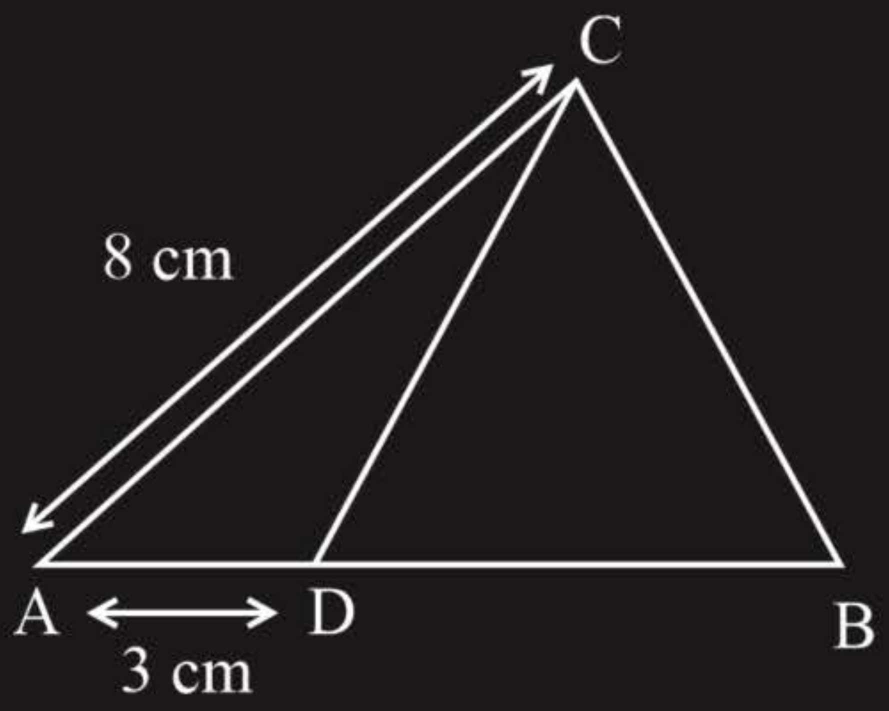
#GPK

A $\frac{22}{3}$ cm

B $\frac{26}{3}$ cm

C $\frac{55}{3}$ cm

D $\frac{64}{3}$ cm



#Q. In the adjoining figure, ΔCAB is a right triangle, right angled at A and $AD \perp BC$. Prove that $\Delta ADB \sim \Delta CDA$. Further, if BC = 10 cm and CD = 2 cm, find the length of AD.

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(3) ~ (1)

$\boxed{\Delta ABC \sim \Delta DAC}$

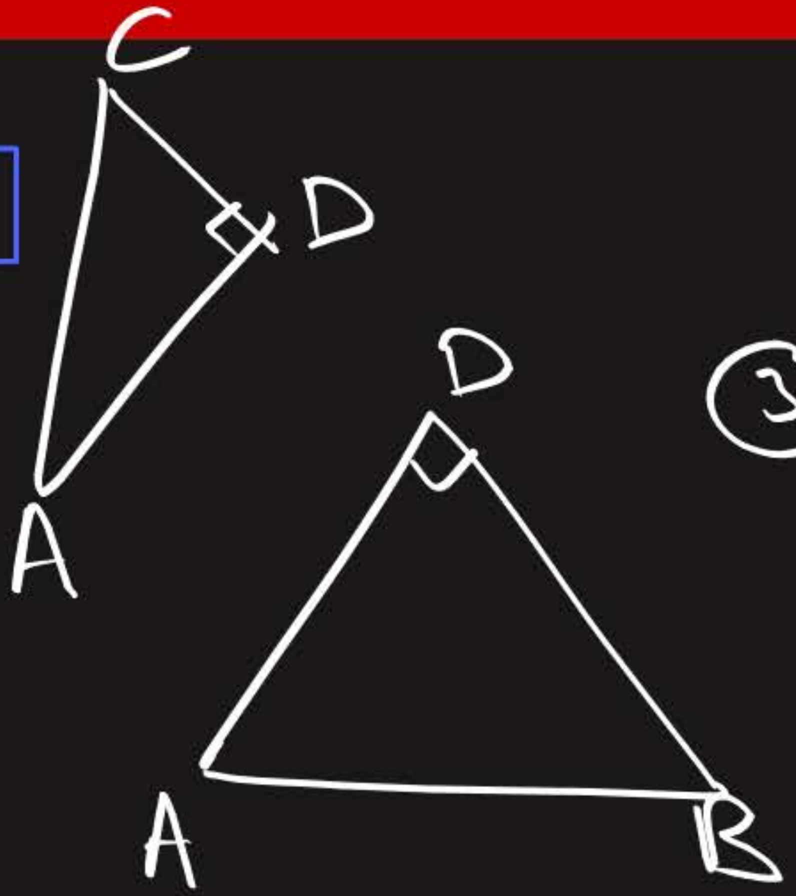
(3) ~ (2)

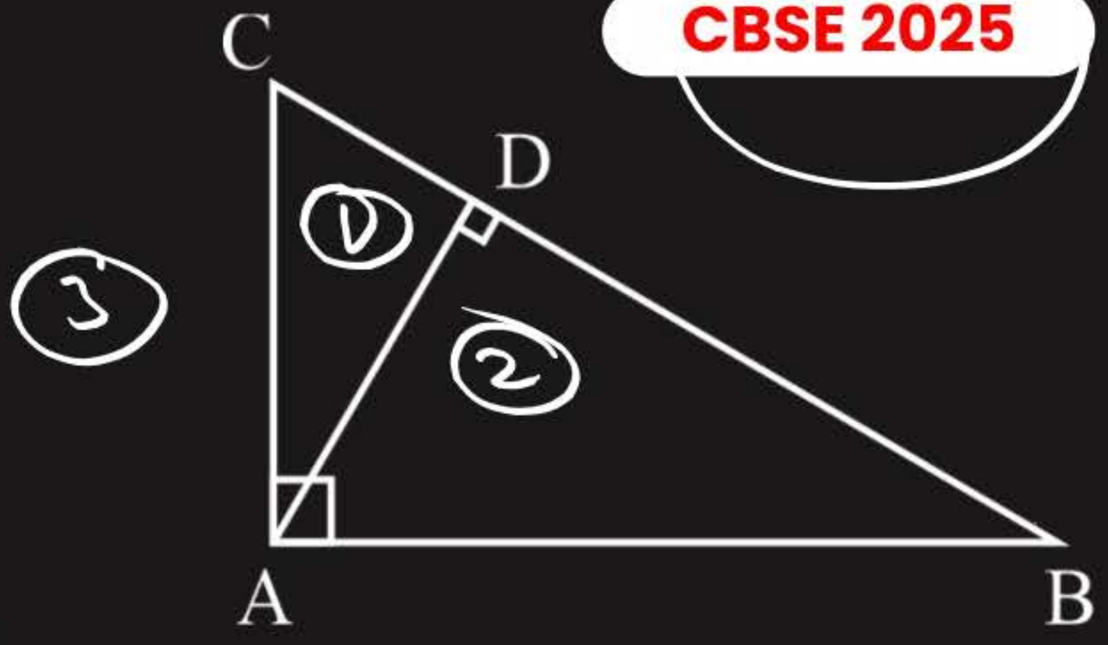
$\boxed{\Delta ABC \sim \Delta DBA}$

$\Rightarrow \boxed{\Delta DAC \sim \Delta DBA}$

CPST,

$$\frac{DA}{DB} = \frac{AC}{BA} = \frac{DC}{DA}$$





#Q. In the adjoining figure, AP = 1 cm, BP = 2 cm, AQ = 1.5 cm and AC = 4.5 cm. Prove that $\Delta APQ \sim \Delta ABC$. Hence, find the length of PQ, if BC = 3.6 cm.

Converse of BPT ← AA, SAS

CPST

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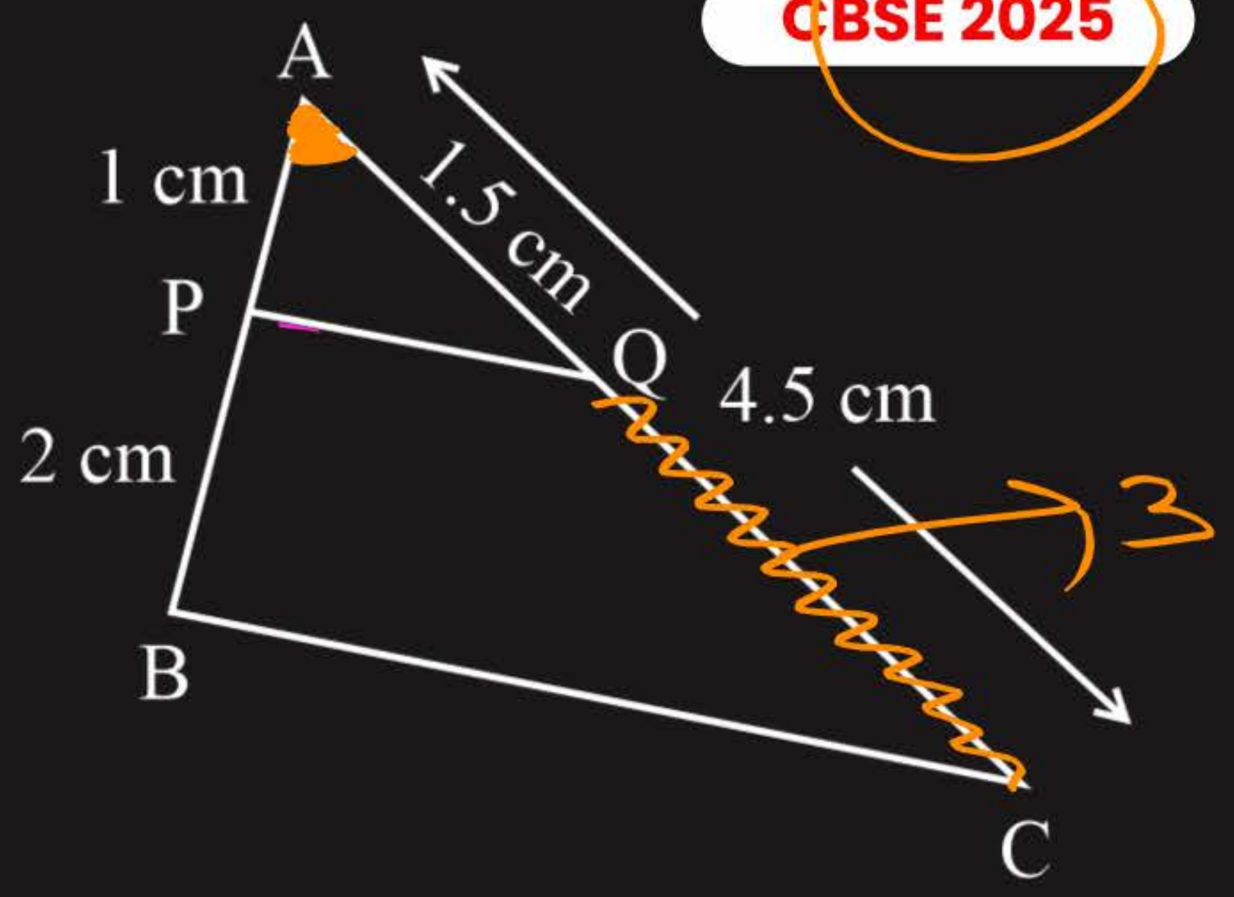

#Q. In the adjoining figure, PQ || XY || BC, AP = 2 cm, PX = 1.5 cm and BX = 4 cm. If QY = 0.75 cm, then AQ + CY =

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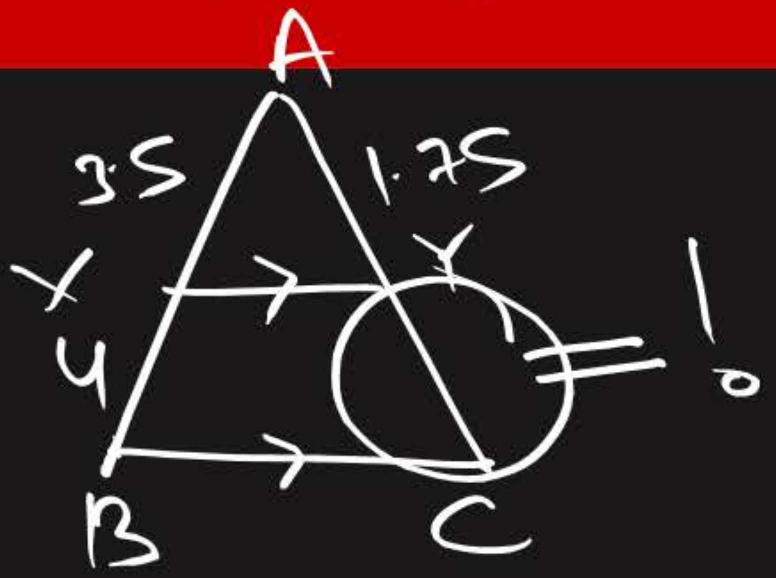
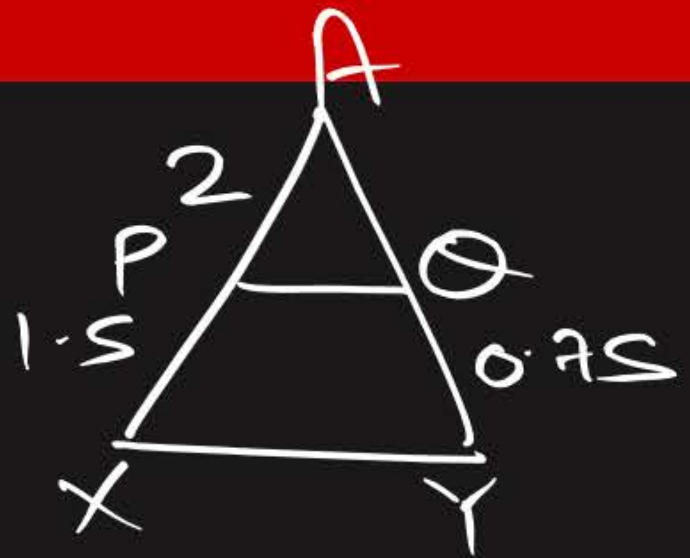
A 6 cm

B 4.5 cm

C 3 cm

D 5.25 cm

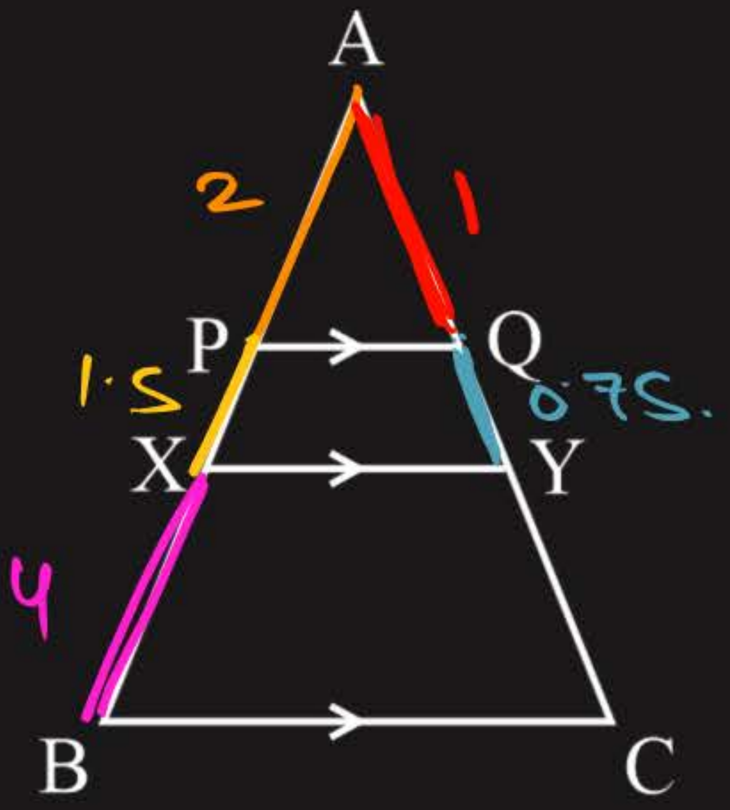




$$\frac{2}{1.5} = \frac{AQ}{0.75}$$

$$\frac{2 \times 0.75}{1.5} = AQ$$

$$1 = AQ$$



#Q. Given $\Delta ABC \sim \Delta PQR$, $\angle A = 30^\circ$ and $\angle Q = 90^\circ$. The value of $(\angle R + \angle B)$ is:

CBSE 2025

$A = P$ — 30°

$B = Q$ — 90°

$C = R$ — 60°

A) 90°

B) 12°

C) 150°

D) 180°

#Q. A 1.5 m tall boy is walking away from the base of lamp post which is 12 m high, at the speed of 2.5 m/sec. Find the length of his shadow after 3 seconds.

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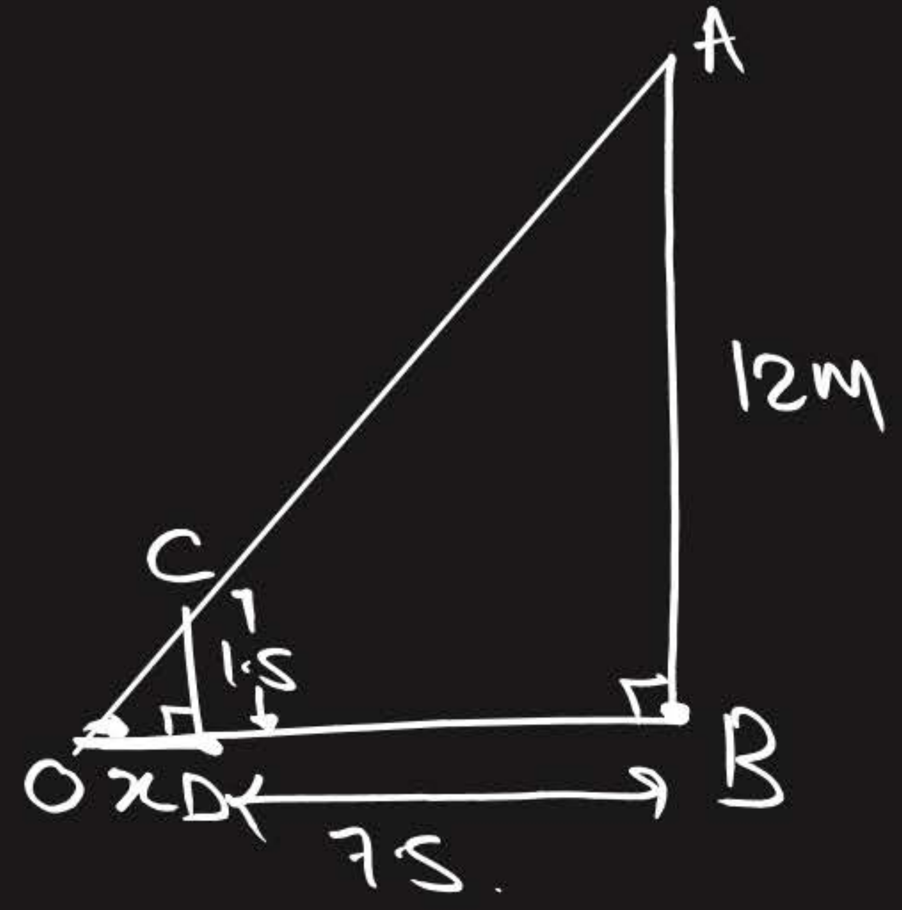
2.5 m = 1 sec

7.5 m = 3 sec



$\Delta CDO \sim \Delta ABO$

$$\frac{CD}{AB} = \frac{DO}{BO} = \frac{CO}{AO}$$

$$\frac{1.5}{12} = \frac{x}{7.5 + x}$$

#Q. The corresponding sides of ΔABC and ΔPQR are in the ratio 3 : 5. $AD \perp BC$ and $PS \perp QR$ as shown in the following figures:

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(i) Prove that $\Delta ADC \sim \Delta PSR$ AA

(ii) If AD = 4 cm, find the length of PS.

(iii) Using (ii) find ar (ΔABC) : ar (ΔPQR)

$$\boxed{\frac{AB}{PQ} = \frac{AC}{PR} = \frac{BC}{QR} = \frac{3}{5}}$$

SSS

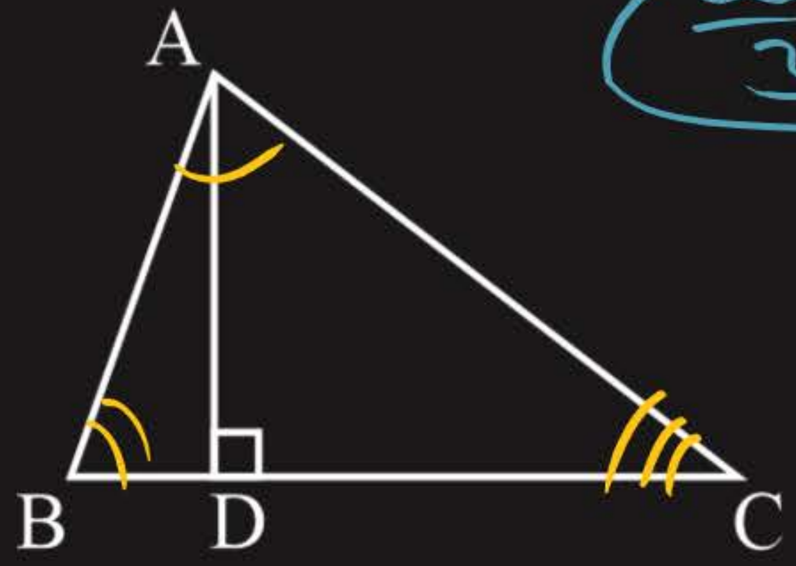
$\Delta ABC \sim \Delta PQR$

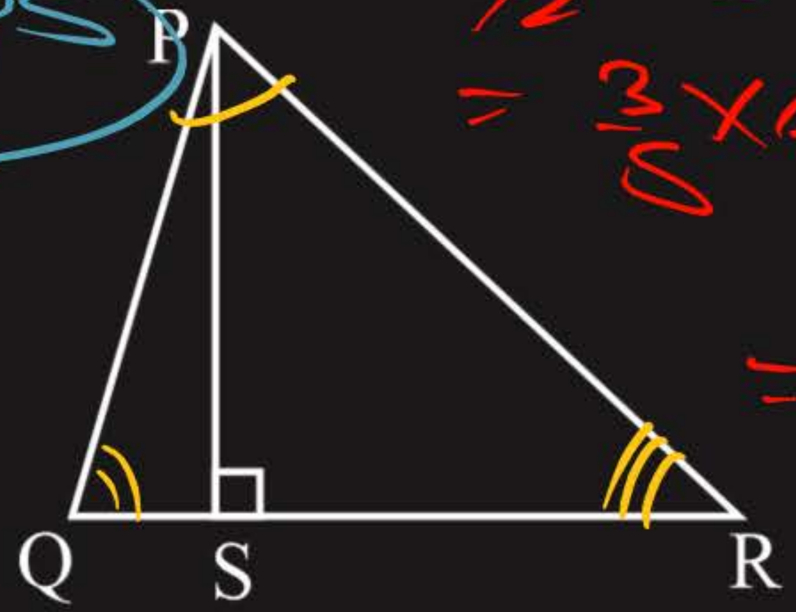
By CPST,

$$\frac{AD}{PS} = \frac{DC}{SR} = \frac{AC}{PR}$$

$$\frac{4}{PS} = \frac{3}{5}$$

$$\frac{20}{3} = PS$$





$$= \frac{\cancel{\frac{1}{2}} \times BC \times AD}{\cancel{\frac{1}{2}} \times QR \times PS}$$

$$= \frac{3}{5} \times \frac{\cancel{4}}{\cancel{20}} \times 3$$

$$= \frac{9}{25} \, cm^2$$

#Q. ΔABC and ΔPQR are shown in the adjoining figures. The measure of $\angle C$ is :

#Gph

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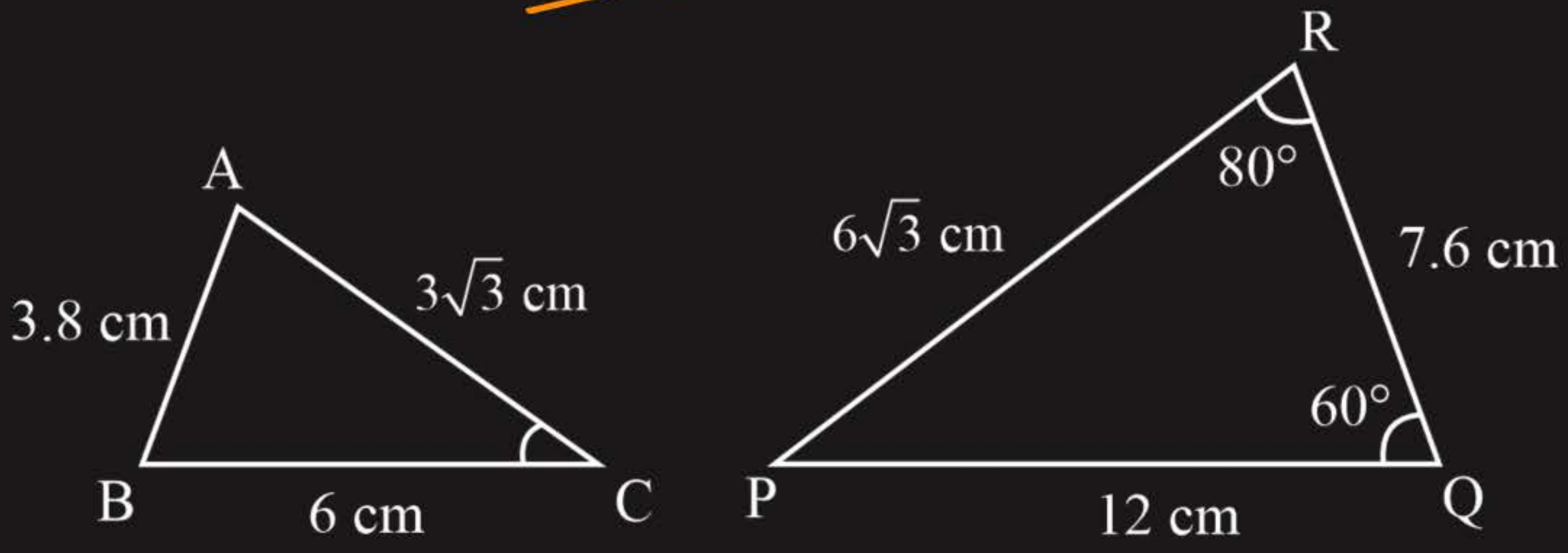


(A) 140°

(B) 80°

(C) 60°

(D) 40°

#Q. E and F are points on the sides AB and AC respectively of a ΔABC such that $\frac{AE}{EB} = \frac{AF}{FC} = \frac{1}{2}$. Which of the following relation is true?

#GPK

CBSE 2025

A $EF = 2\,BC$

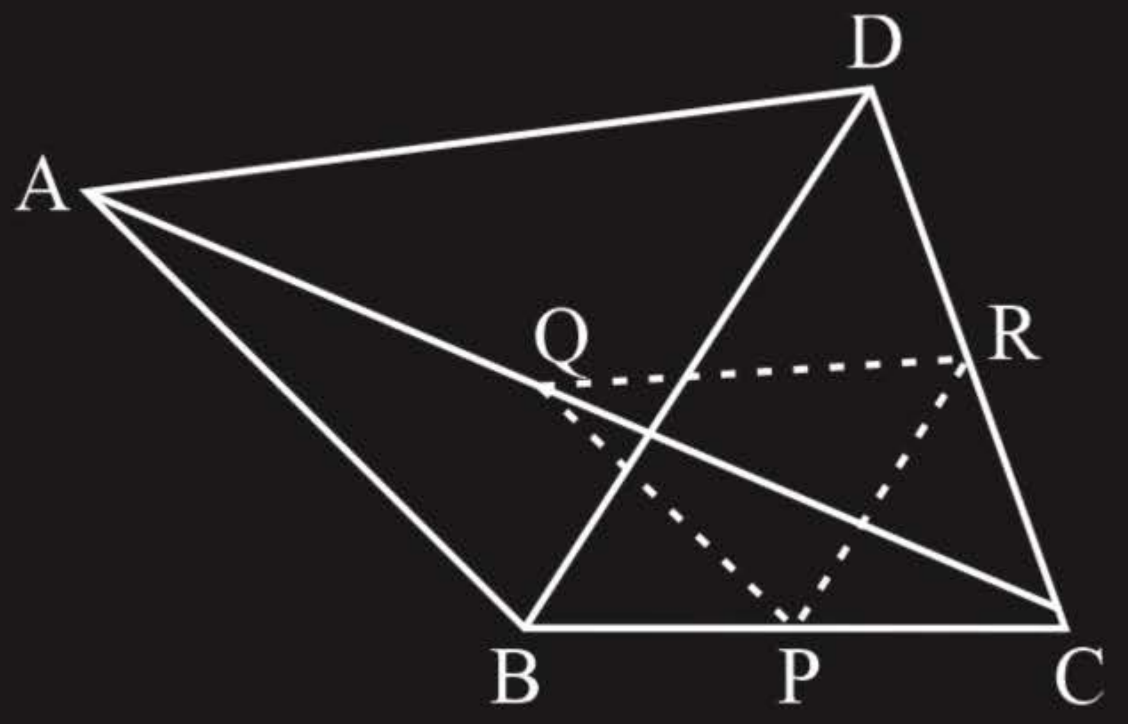
B $BC = 2\,EF$

C $EF = 3\,BC$

D $BC = 3\,EF$

#Q. Two triangles ABC and DBC lie on the same side of the base BC. From a point P on BC, PQ||AB and PR||BD are drawn. They meet AC in Q and DC in respectively. Prove that QR || AD.

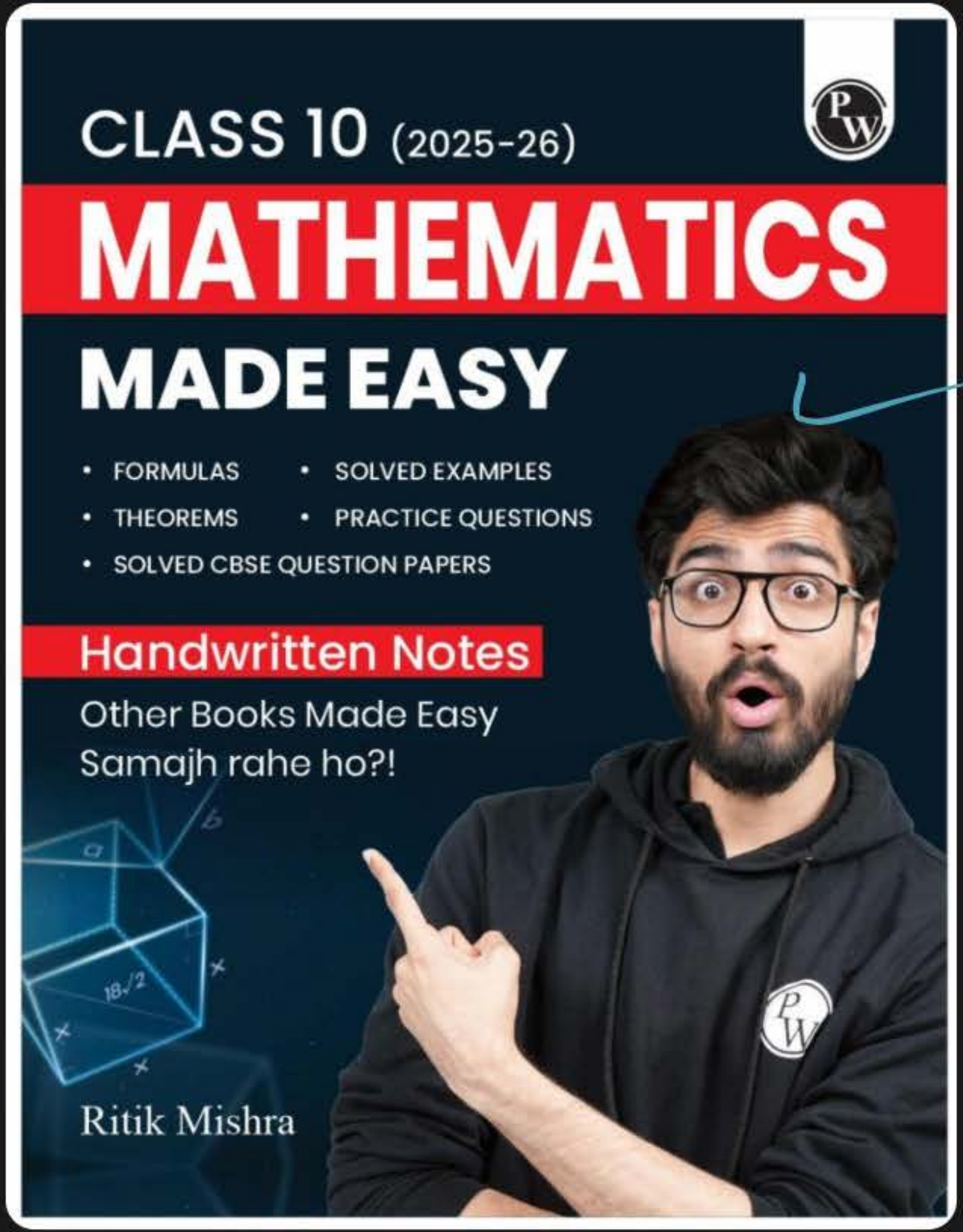
#GPh

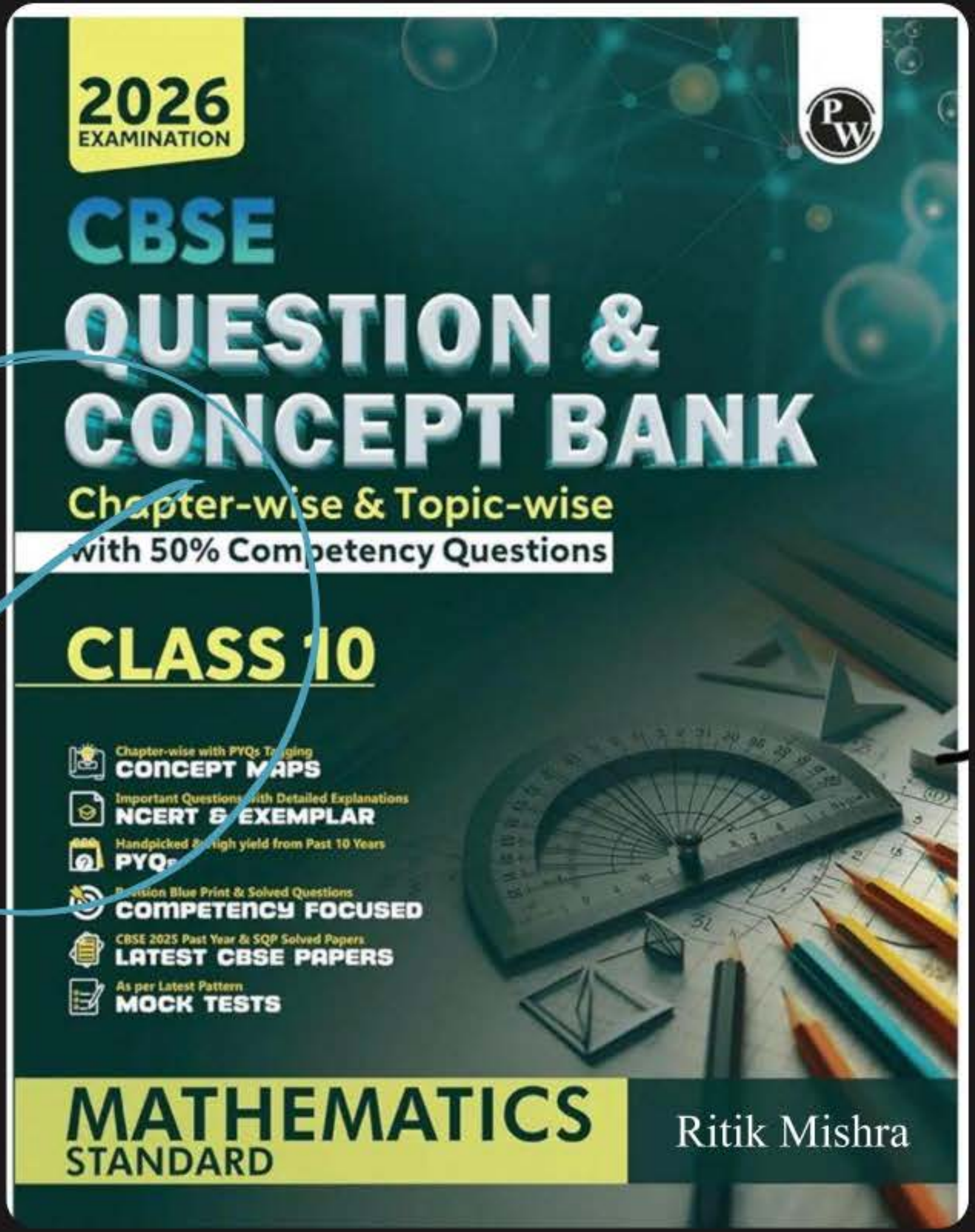


Scale factor

Corresponding sides ka ratio in similar Δ's

Notes (Revision)

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