

Shortest median $m = R$

$$\Delta = r(r+2R)$$

$$= \delta(\delta - c) = \delta(\delta - 2R) = \delta(\delta - 2m)$$

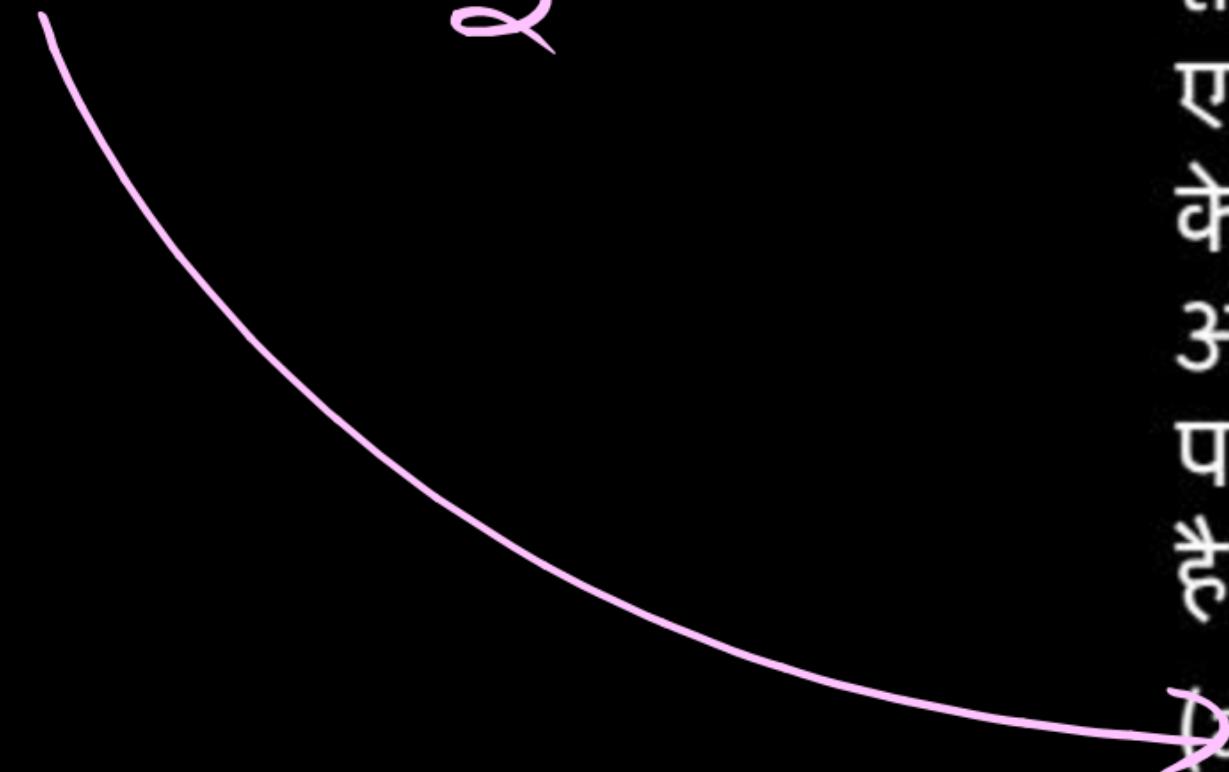
$$\text{area} = \frac{1}{2}ab$$

$$r = \frac{a+b-c}{2}$$

$$R = \sqrt{\frac{a^2 + b^2 + c^2}{2}}$$

$$r = \frac{a+b-c}{2} = \frac{a+b}{2} - R$$

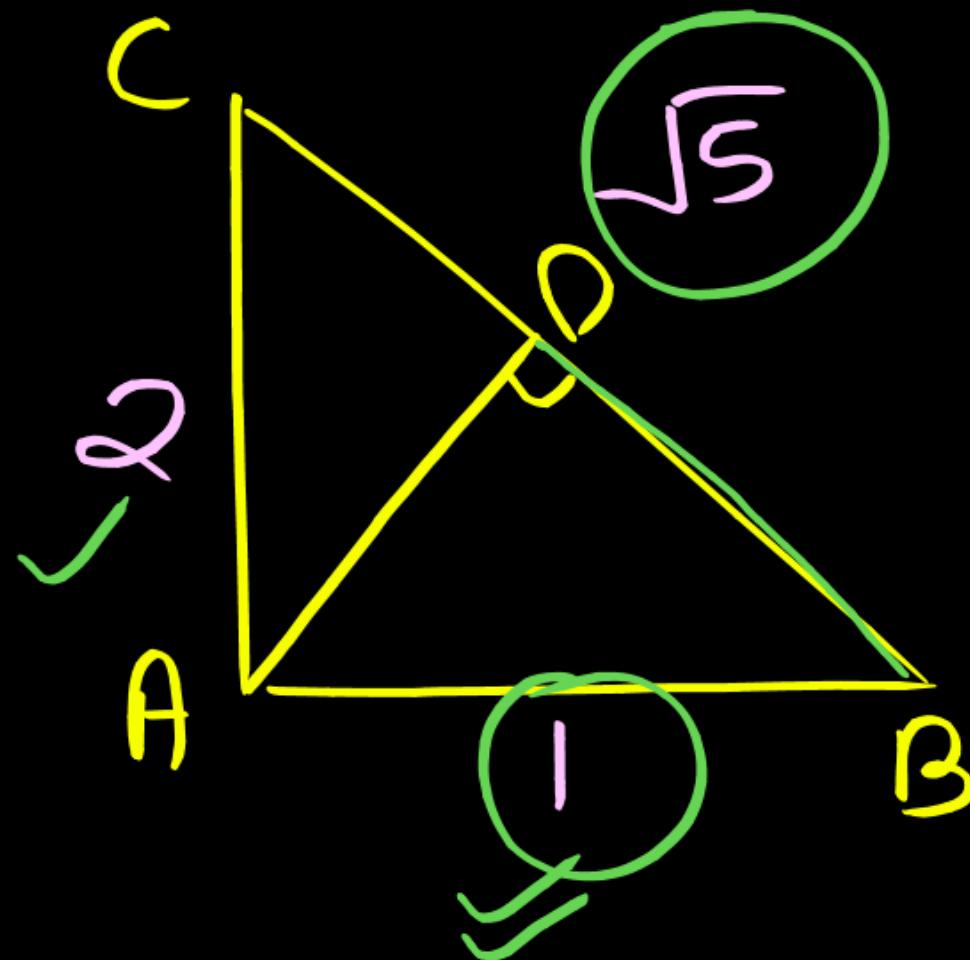
$$r+R = \frac{a+b}{2}$$



In a right angle triangle, legs of right angle triangle is P and B respectively, in which r is inradius and R is circumradius of triangle, then which statement is true?

एक समकोण त्रिभुज में, समकोण त्रिभुज के पाद क्रमशः P और B हैं, जिसमें r अंतःत्रिज्या है और R त्रिभुज की परित्रिज्या है, तो कौन सा कथन सत्य है?

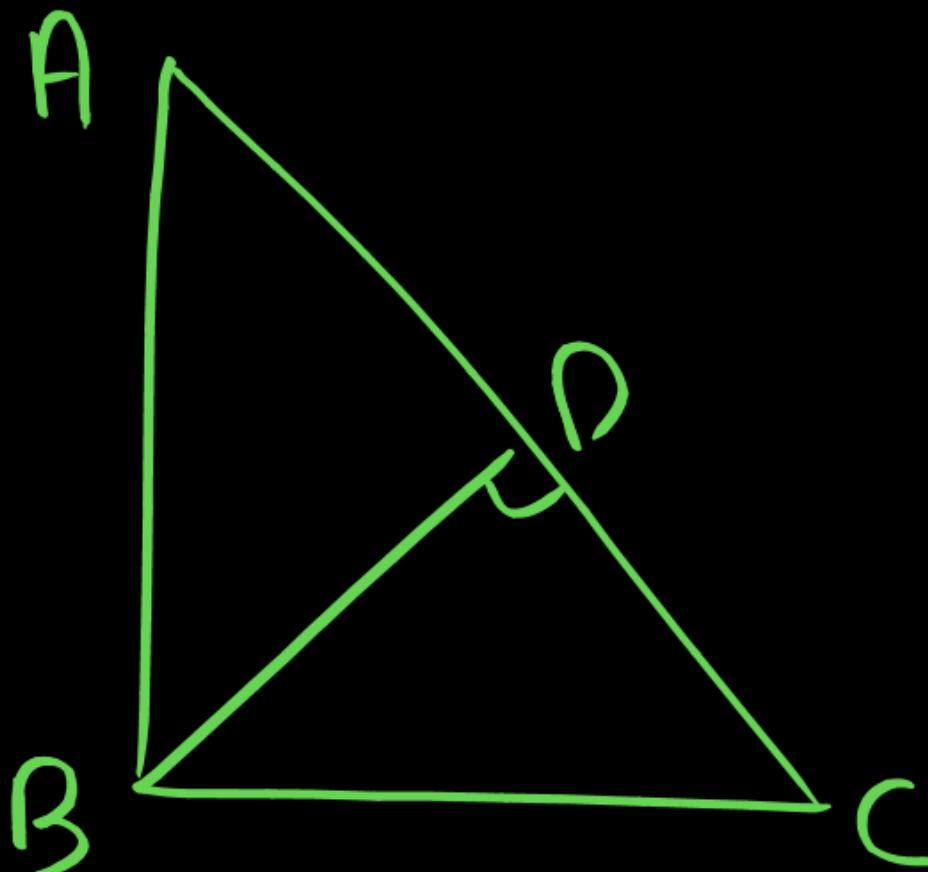
- (a) $R + r = \frac{P+B}{2}$
- (b) $2r + 3R = P + B$
- (c) $2R + r = 2(P + B)$
- (d) $R + r = 2(P + B)$



In a right-angle ΔABC , $\angle A = 90^\circ$, and $AD \perp BC$, BC is hypotenuse. $AC = 2AB$, $BD = ?$
 एक समकोण ΔABC में, $\angle A = 90^\circ$, और $AD \perp BC$, BC कर्ण है। $AC = 2AB$, $BD = ?$

- (a) $\frac{BC}{2}$
- (b) $\frac{BC}{3}$
- (c) $\frac{BC}{4}$
- (d) $\frac{BC}{5}$

$$\begin{aligned}
 BD &= \frac{BC}{\sqrt{5}} \\
 &= \frac{1^2}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5} \\
 &= \frac{BC}{5}
 \end{aligned}$$



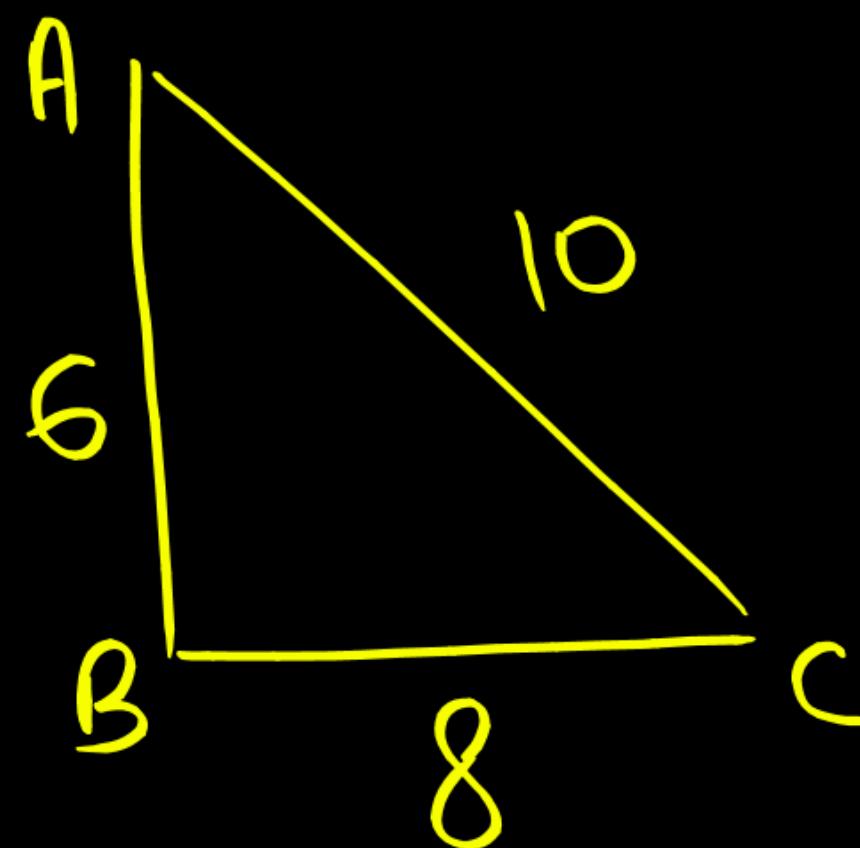
$$BD^2 = AD \cdot DC$$

ABC is a right angle triangle and angle ABC = 90 degrees. BD is a perpendicular on the side AC. What is the value of BD^2 ?

ABC एक समकोण त्रिभुज है और कोण ABC = 90 डिग्री है। BD, AC की भुजा पर एक लम्ब है। BD^2 का मान क्या है?

- a) $BC \times CD$
- b) $AD \times DC$
- c) $AD \times AC$
- d) $BC \times AB$

SSC CGL Mains 2022 (08/08/2022)
(9:00 am to 11 am) (Monday)



$$r = \frac{6+8-10}{2}$$

= 2

In a right angle triangle $\triangle ABC$, $\angle B = 90^\circ$, $AB = 6$ cm and $AC = 10$ cm, then find the inradius of $\triangle ABC$?

एक समकोण त्रिभुज $\triangle ABC$ में, $\angle B = 90^\circ$, $AB = 6$ सेमी और $AC = 10$ सेमी है, तो $\triangle ABC$ की अंतःत्रिज्या ज्ञात कीजिए?

- (a) 1 cm
- (b) 2 cm
- (c) 1.5 cm
- (d) 2.5 cm

A.P में right angle D की Side

3,4,5 - Consecutive no.

6, 8, 10
9, 12, 15
12, 16, 20

3, 4, 5

$\Delta = \frac{1}{2} \times 3 \times 4$

$= 6$

The sides of a right angled triangle are equal to three consecutive numbers expressed in centimeters. What can be the area of such a triangle?

एक समकोण त्रिभुज की भुजाएँ सेंटीमीटर में व्यक्त तीन क्रमागत संख्याओं के बराबर हैं। ऐसे त्रिभुज का क्षेत्रफल क्या हो सकता है?

- (a) 6 cm^2
- (b) 8 cm^2
- (c) 10 cm^2
- (d) 12 cm^2

$$x-9 \quad x \quad x+9$$

27, 36, 45

If the perimeter of a right angle triangle is 144 cm and its circumradius is 32.5 cm. Find the area of the triangle ?

यदि एक समकोण त्रिभुज का परिमाप 144 सेमी है और इसकी परित्रिज्या 32.5 सेमी है। त्रिभुज का क्षेत्रफल ज्ञात कीजिए?

- (a) 520 cm^2
- (b) 512 cm^2
- (c) ~~504~~ cm^2
- (d) None of these

} - semi-perimeter
 $P/2$

$$\begin{aligned}\Delta &= \pi(P - 2R) \\&= \pi(72 - 65) \\&= \pi \cdot 7 \\&= 504\end{aligned}$$

If the inradius and circumradius of a right angle triangle are 3 cm and 10 cm respectively, then find the area of the triangle ?

यदि एक समकोण त्रिभुज की अंतःत्रिज्या और परित्रिज्या क्रमशः 3 सेमी और 10 सेमी है, तो त्रिभुज का क्षेत्रफल ज्ञात कीजिए?

- (a) ~~69~~ 69 cm^2
(b) 56 cm^2
(c) 65 cm^2
(d) 75 cm^2

$$\begin{aligned}\text{Area} &= r(r+2R) \\ &= 3(3+20) \\ &= 69\end{aligned}$$

$$5h^2 = 4(7^2 + (4\sqrt{6})^2)$$

$$5h^2 = 4(49 + 96)$$

$$= 4 \cdot 145$$

$$h = \underline{\underline{2\sqrt{29}}}$$

In a right-angled triangle, the lengths of the medians from the vertices of acute angles are 7 cm and $4\sqrt{6}$ cm. What is the length of the hypotenuse of the triangle (in cm)?

एक समकोण त्रिभुज में न्यून कोणों के शीर्षों से माध्यिकाओं की लंबाई 7cm और $4\sqrt{6}$ cm. है। त्रिभुज के कर्ण की लंबाई (सेमी में) क्या है?

(a) $\sqrt{29}$

(b) $\frac{5}{2}\sqrt{29}$

(c) $2\sqrt{29}$

(d) $3.5 + 2\sqrt{6}$

SSC CGL 19.04.2022 (1st Shift)

Similarity in right angle D.

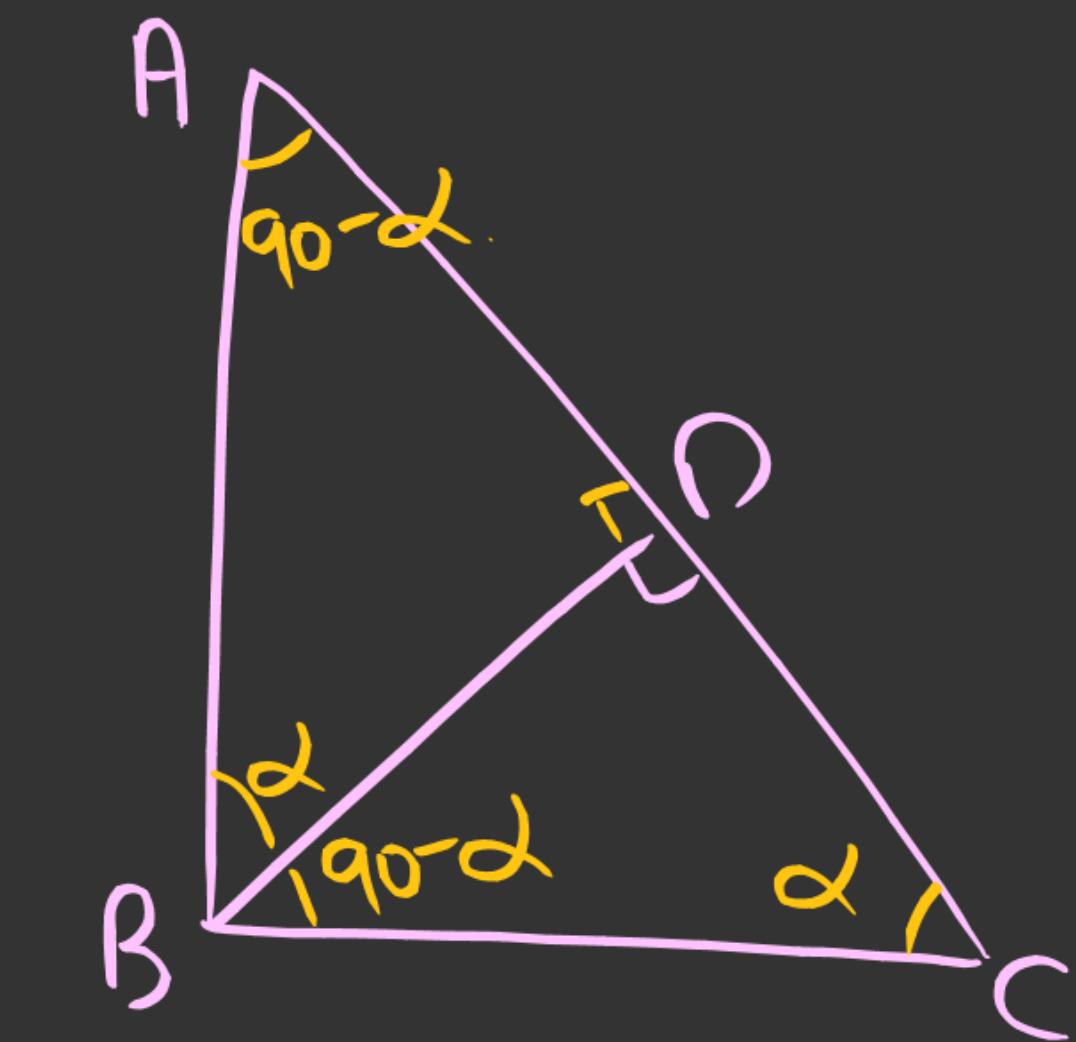
$\triangle ABC$, $\triangle BDC$, $\triangle ADB$

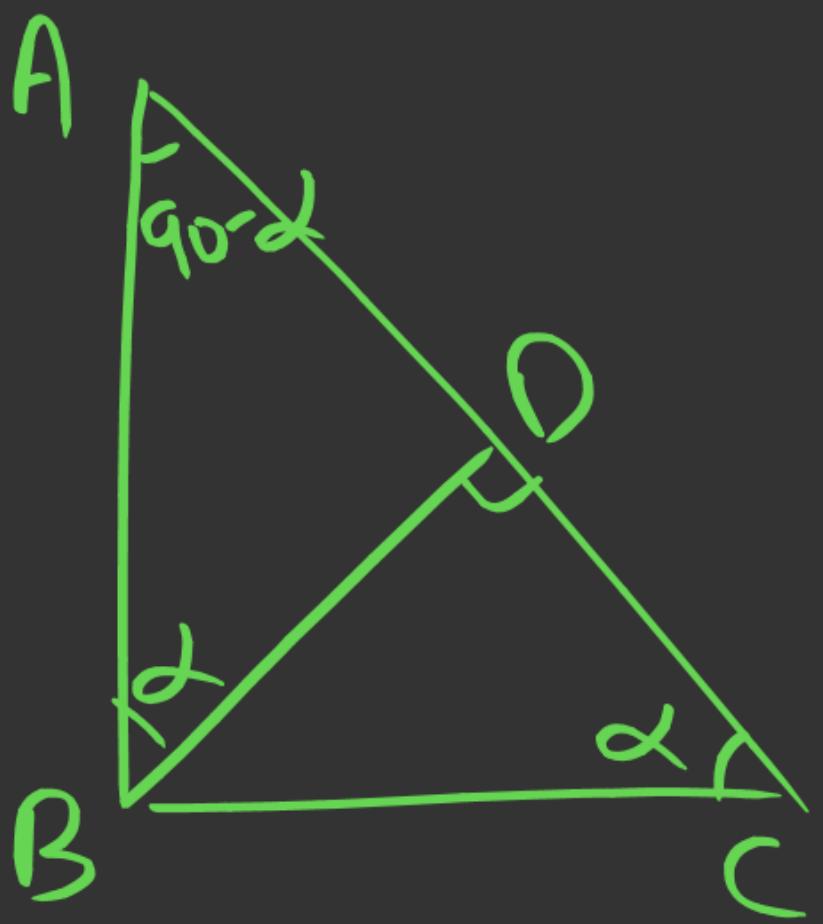
$\frac{\alpha}{\beta}$

$\alpha, 90, 90-\alpha$

all are Similar triangle.

$$\text{area} = \frac{1}{2} \times AB \cdot BC = \frac{1}{2} BD \cdot AC \rightarrow BD = \frac{AB \cdot BC}{AC} \quad \text{(i)}$$





$\triangle BDC$:

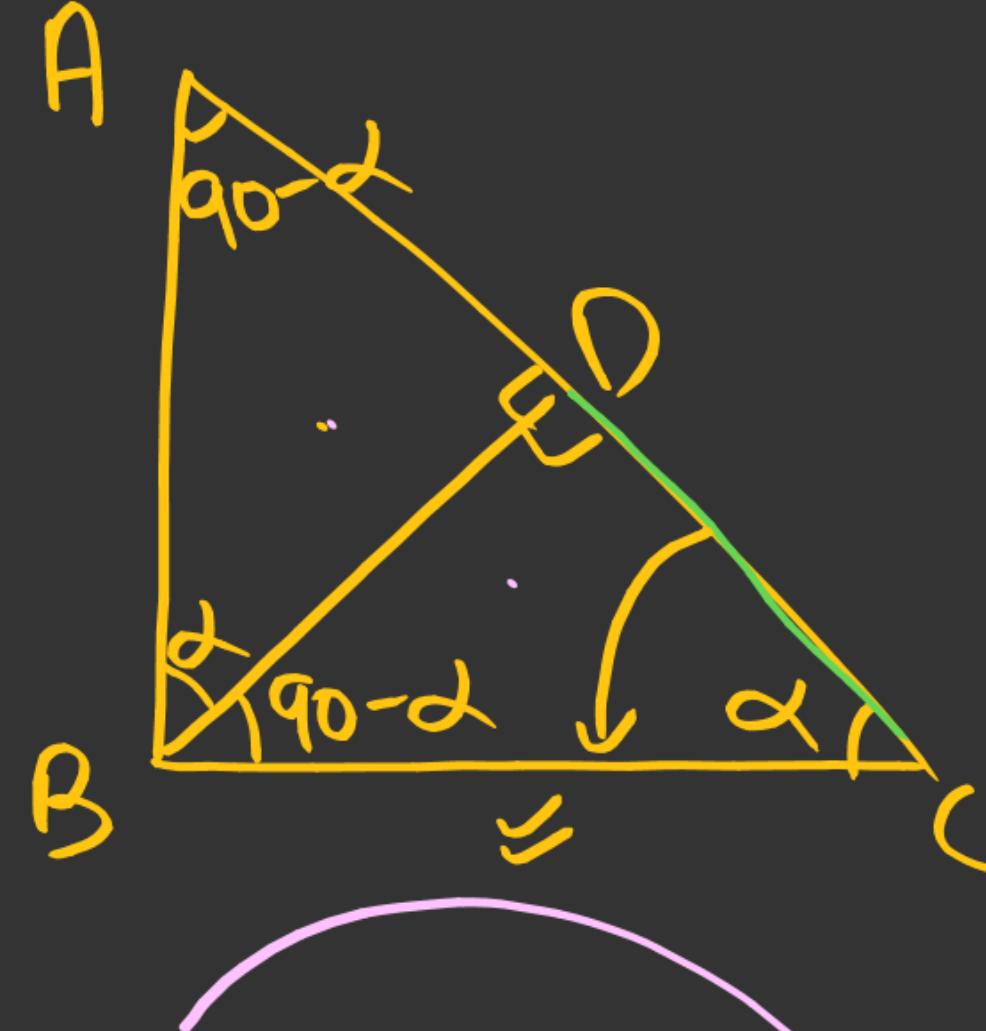
$$\tan \alpha = \frac{BD}{CD}$$

$\triangle ABD$:

$$\tan \beta = \frac{AD}{BD}$$

$$\left. \begin{array}{l} \tan \rightarrow \frac{b}{h} \\ \sin \rightarrow \frac{b}{c} \\ \cos \rightarrow \frac{b}{c} \end{array} \right\}$$

$$\frac{BD}{CD} \neq \frac{AD}{BD} \Rightarrow \boxed{BD^2 = AD \cdot CD} \quad \text{--- Q.E.D.}$$

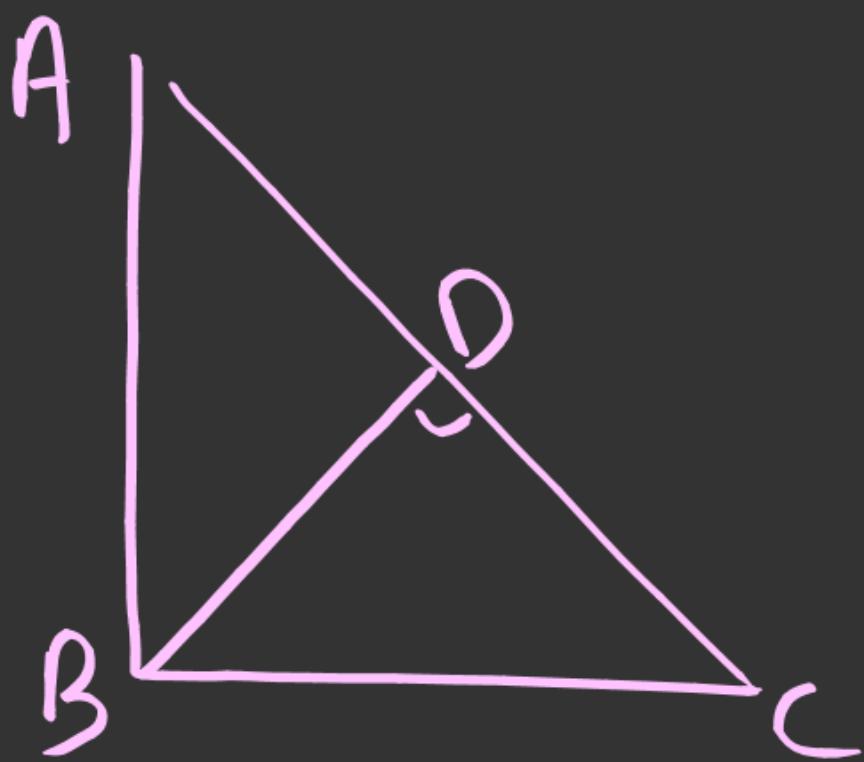


$\text{In } \triangle BDC \text{ में}$

$$\cos \alpha = \frac{CD}{BC} = \frac{BC}{AC} \Rightarrow CD = \frac{BC^2}{AC}$$

$\triangle BDC : \triangle ABD = CD : AD = BC^2 : AB^2$

Similarly $\Rightarrow AD = \frac{AB^2}{AC}$

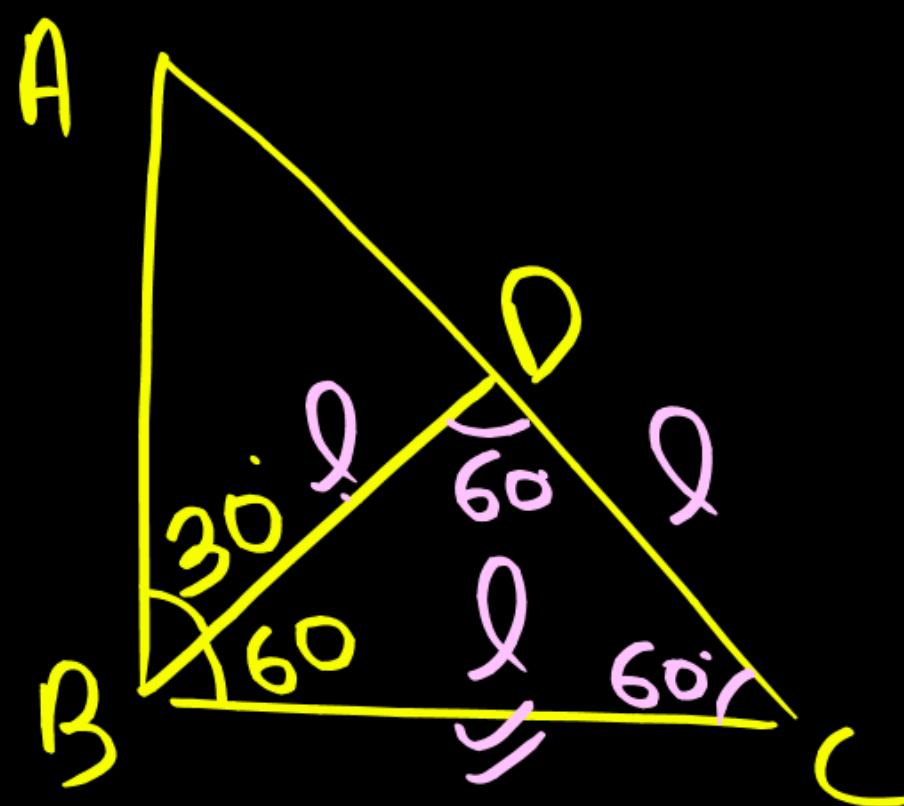


$$BD = \sqrt{AD \cdot CD} = \frac{AB \cdot BC}{AC}$$

$$CD = \frac{BC^2}{AC}$$

$$AD = \frac{AB^2}{AC}$$

$$\Delta BDC : \Delta ABD = CD : AD = BC^2 : AB^2$$

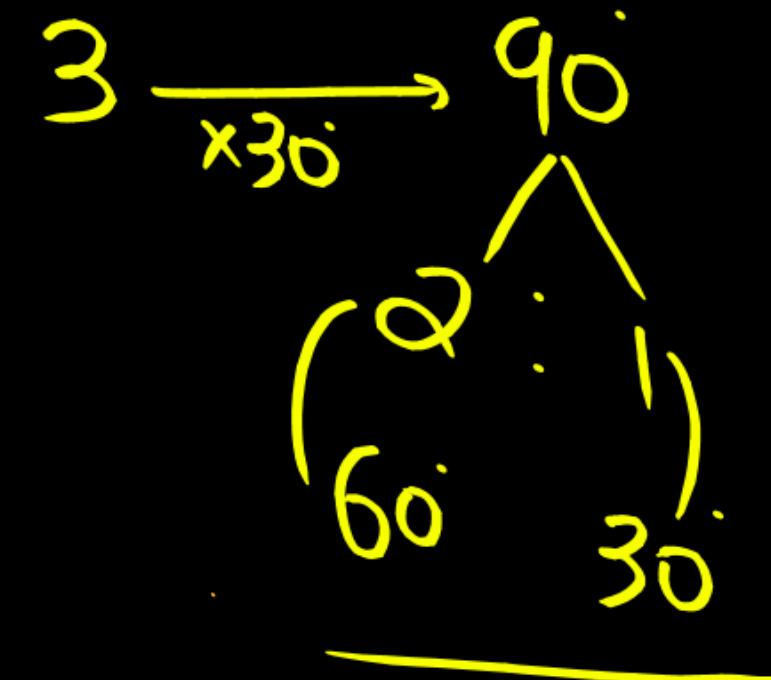


$\triangle BDC$ -equilateral.

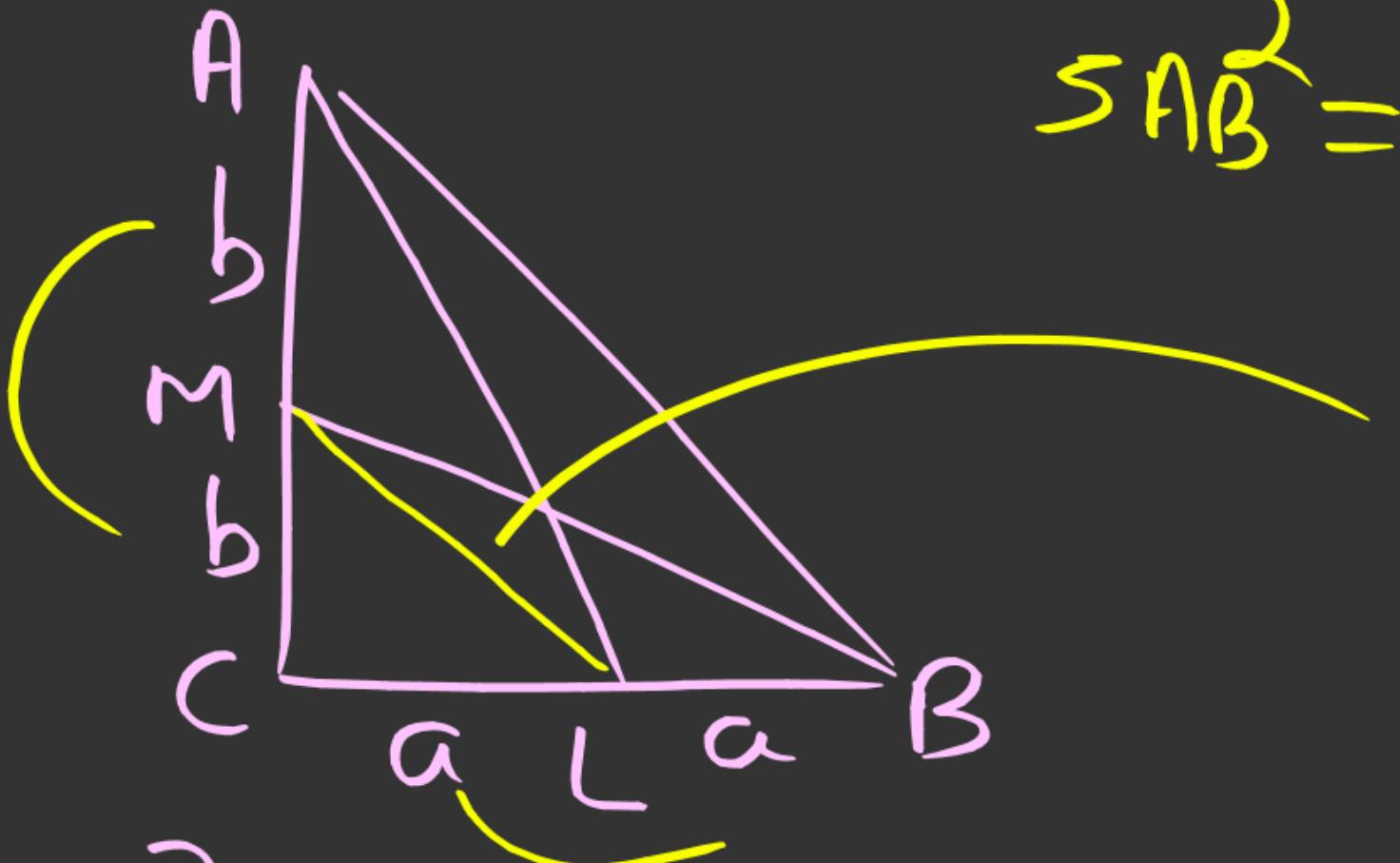
$$\begin{aligned} \text{Area of } \triangle ABC &= 2 \cdot \text{Area of } \triangle BDC \\ &= 2 \times \frac{\sqrt{3}}{4} l^2 \end{aligned}$$

In a right angle triangle ABC right angled at B, median BD of length L divides angle B in the ratio 2 : 1. Find area of $\triangle ABC$?
एक समकोण त्रिभुज ABC में B पर समकोण है, L लंबाई की मध्यिका BD कोण B को 2 : 1 के अनुपात में विभाजित करती है। $\triangle ABC$ का क्षेत्रफल ज्ञात कीजिए?

- (a) $\frac{3}{2} L^2$
- (b) $\frac{\sqrt{3}}{2} L^2$
- (c) $\sqrt{3} L^2$
- (d) $\frac{1}{2} L^2$



Imp note



$$SAB^2 = 4(A\bar{L}^2 + \bar{M}^2)$$

$$\bar{M}^2 = \bar{q}^2 + \bar{b}^2.$$

$$A\bar{L}^2 = 4\bar{b}^2 + \bar{q}^2$$

$$(\bar{M})^2 = \bar{b}^2 + 4\bar{q}^2$$

$$\frac{A\bar{L}^2 + (\bar{M})^2}{A\bar{L}^2 + (\bar{M})^2} = S(q^2 + b^2) \rightarrow 4(A\bar{L}^2 + \bar{M}^2) = 4(q^2 + b^2) = SAB^2$$

In $\triangle ABC$ which is right angle at A and BC is 5 cm. BL and CM are medians. If $BL = \frac{3\sqrt{5}}{2}$ cm. then find CM ?

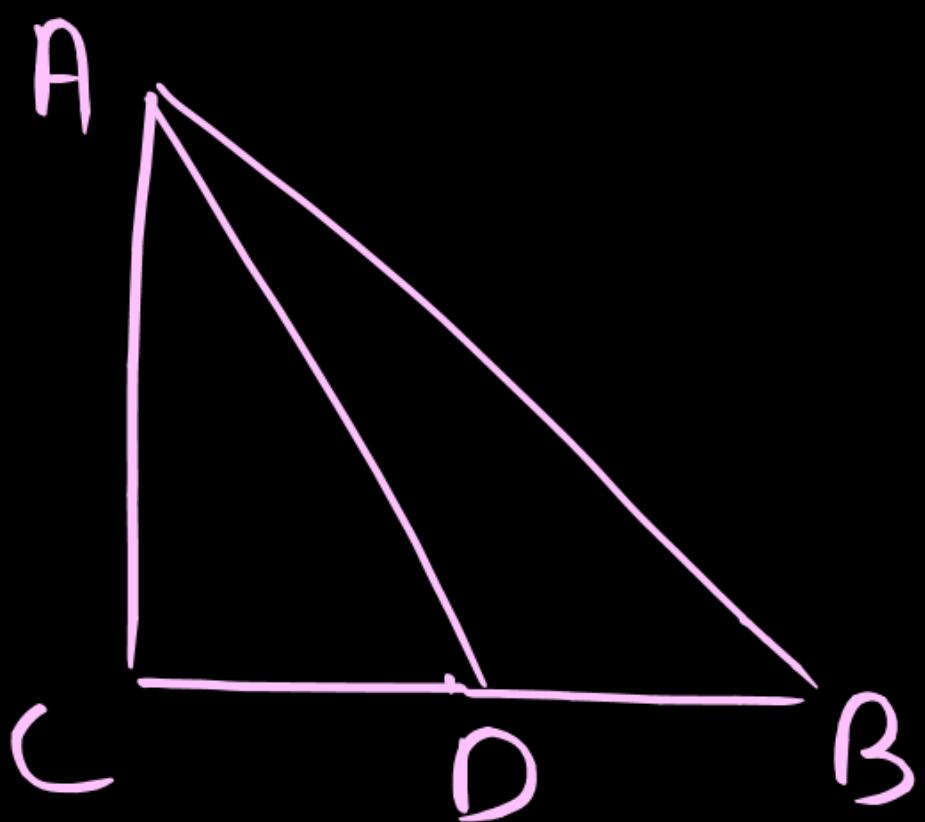
$\triangle ABC$ में, जो A पर समकोणीय है और जिसमें BC = 5 सेमी है, दो माध्यिकाएँ BL तथा CM हैं।

तदनुसार, यदि $BL = \frac{3\sqrt{5}}{2}$ सेमी है, तो CM की लम्बाई ज्ञात कीजिये?



$$5BC^2 = 4(BL^2 + CM^2)$$

- (a) $2\sqrt{5}$ cm
- (b) $5\sqrt{2}$ cm
- (c) $10\sqrt{2}$ cm
- (d) $4\sqrt{5}$ cm



$$\begin{aligned} \cancel{AC^2 + BC^2 = AB^2} \\ AD^2 = AC^2 + CD^2 \\ \hline AD^2 + BD^2 = AB^2 + CD^2 \end{aligned}$$

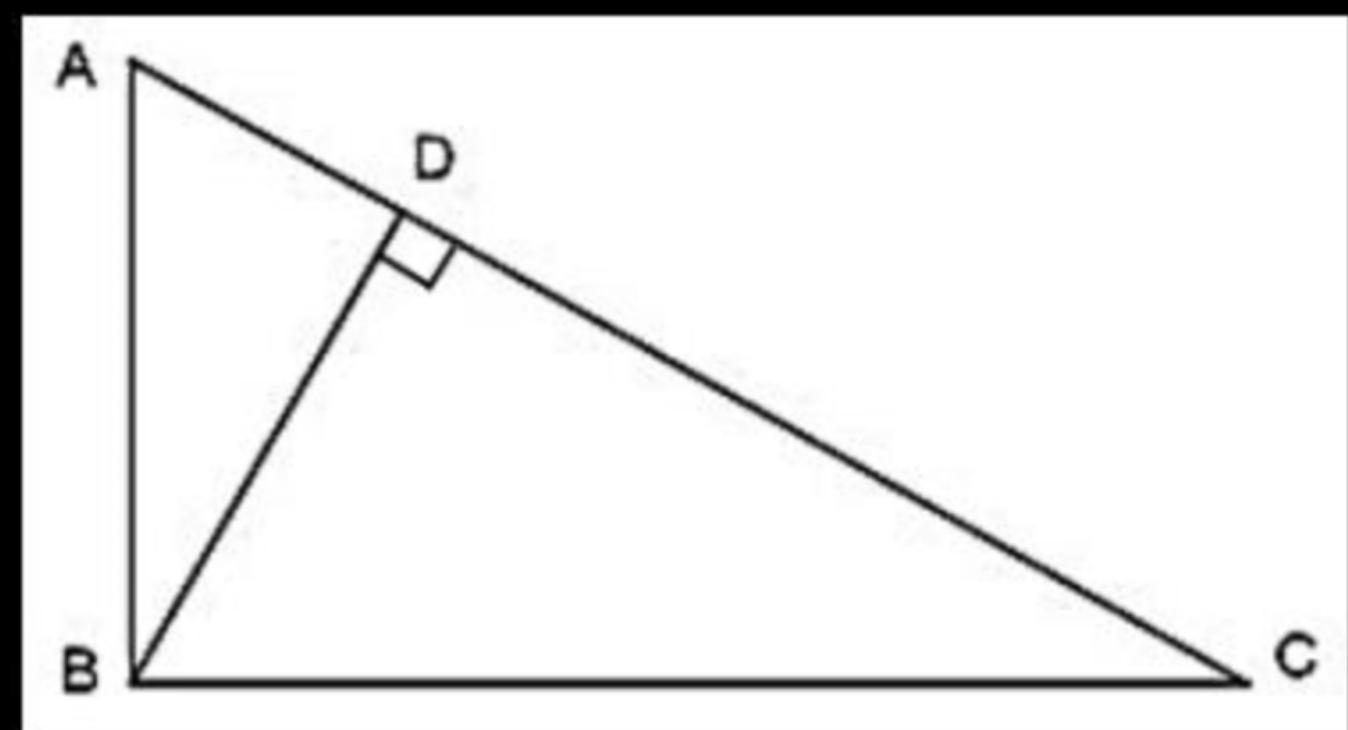
A point D is taken from the side BC of a right-angled triangle ABC, where AB is hypotenuse. Then ?

एक समकोण त्रिभुज ABC की भुजा BC से एक बिंदु D लिया गया है, जहाँ AB कर्ण है। तब ?

- (a) $AB^2 + CD^2 = BC^2 + AD^2$
- (b) $CD^2 + BD^2 = 2AD^2$
- (c) $CD^2 + BD^2 = 2AD^2$
- (d) $AB^2 = AD^2 + BD^2$

Advance Properties of Right Angle Triangle

- In a right angled triangle, the triangles on each side of the altitude drawn from the vertex of the right angle to the hypotenuse are similar to the original triangle and to each other too.
 - एक समकोण त्रिभुज में, समकोण के शीर्ष से कर्ण तक खींची गई ऊँचाई की प्रत्येक भुजा पर त्रिभुज मूल त्रिभुज के समान होते हैं और एक दूसरे के भी।
- ▲ABC, ▲ADB and ▲BDC are similar.
 ▲ABC, ▲ADB और ▲BDC समरूप हैं।



➤ If $\triangle ADB \sim \triangle BDC$

$$\Rightarrow \frac{AD}{BD} = \frac{BD}{CD}$$

$$\Rightarrow BD^2 = AD \times CD$$

➤ Area of $\triangle ABC$

$$\Rightarrow \frac{1}{2} \times AB \times BC = \frac{1}{2} \times AC \times BD$$

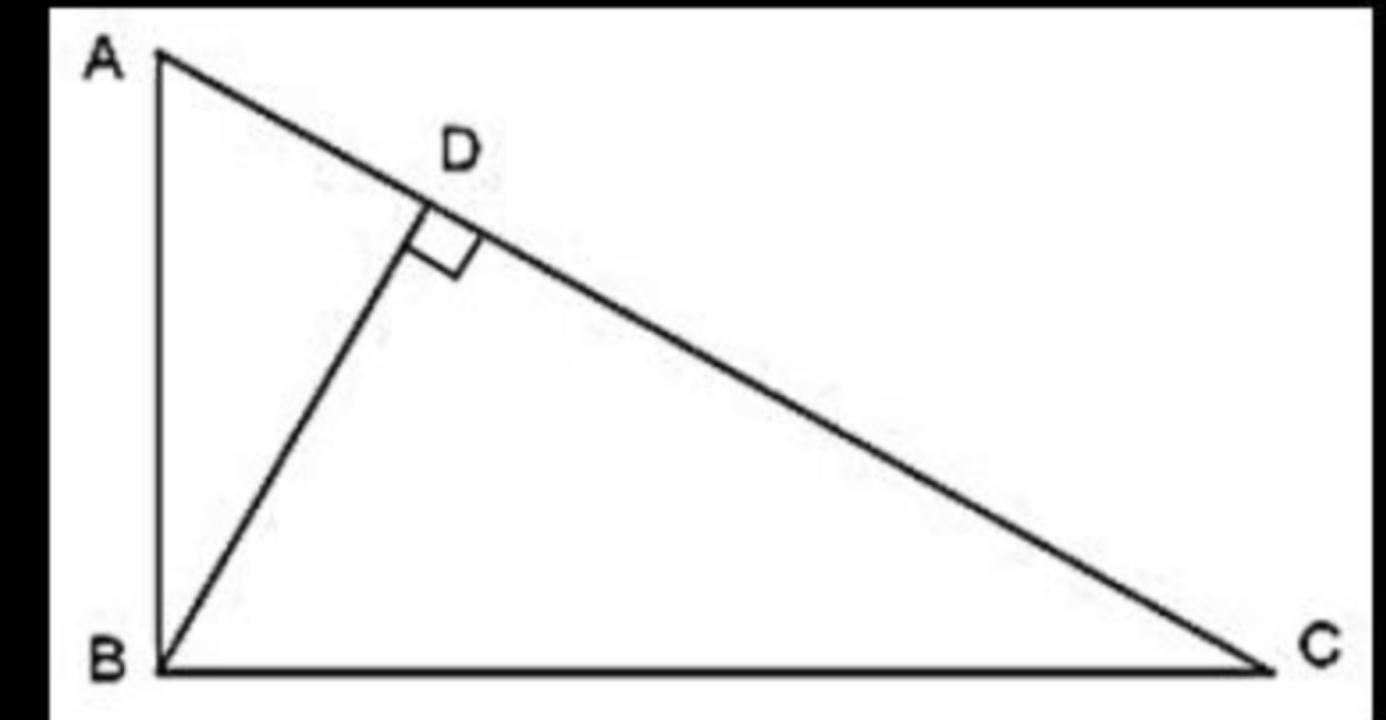
$$\Rightarrow AB \times BC = AC \times BD$$

$$\Rightarrow BD = \frac{AB \times BC}{AC}$$

➤ $\triangle ABC \sim \triangle ADB$

$$\Rightarrow \frac{AB}{AD} = \frac{AC}{AB}$$

$$\Rightarrow AB^2 = AD \times AC$$



➤ $\triangle ABC \sim \triangle BDC$

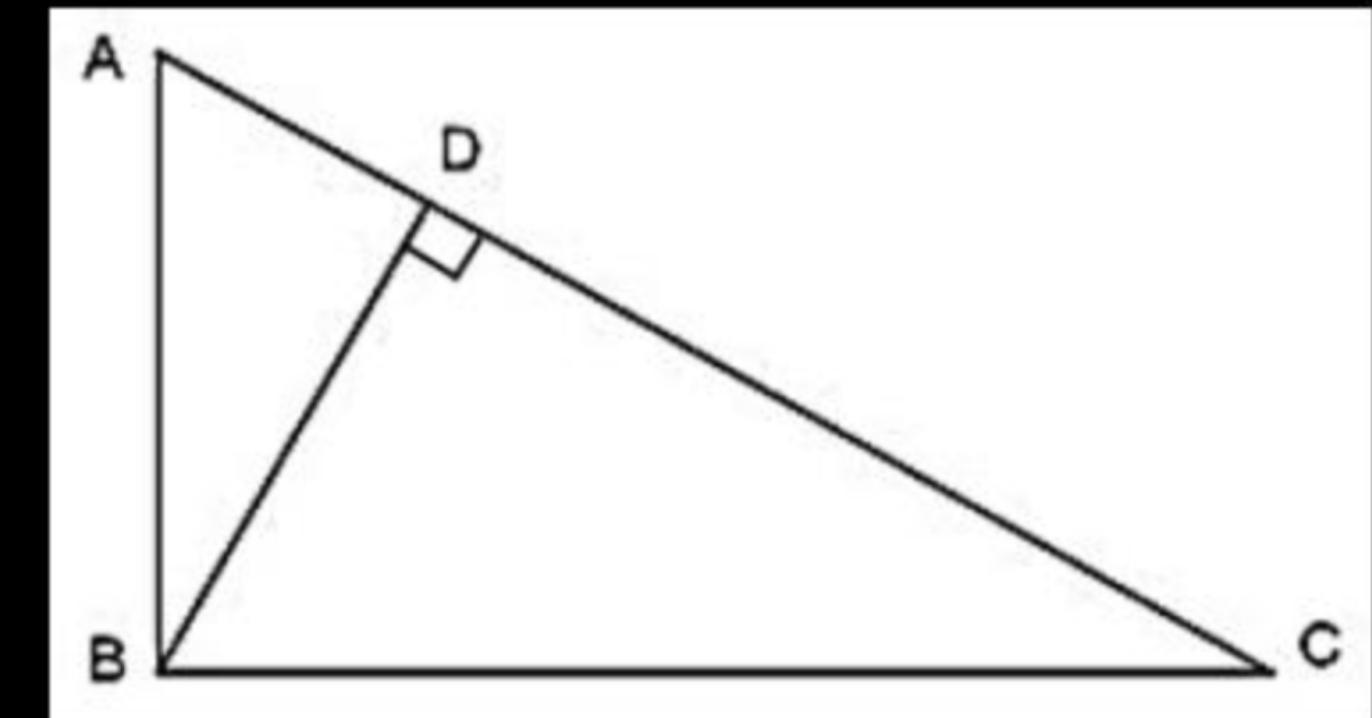
$$\Rightarrow \frac{AC}{BC} = \frac{BC}{DC}$$

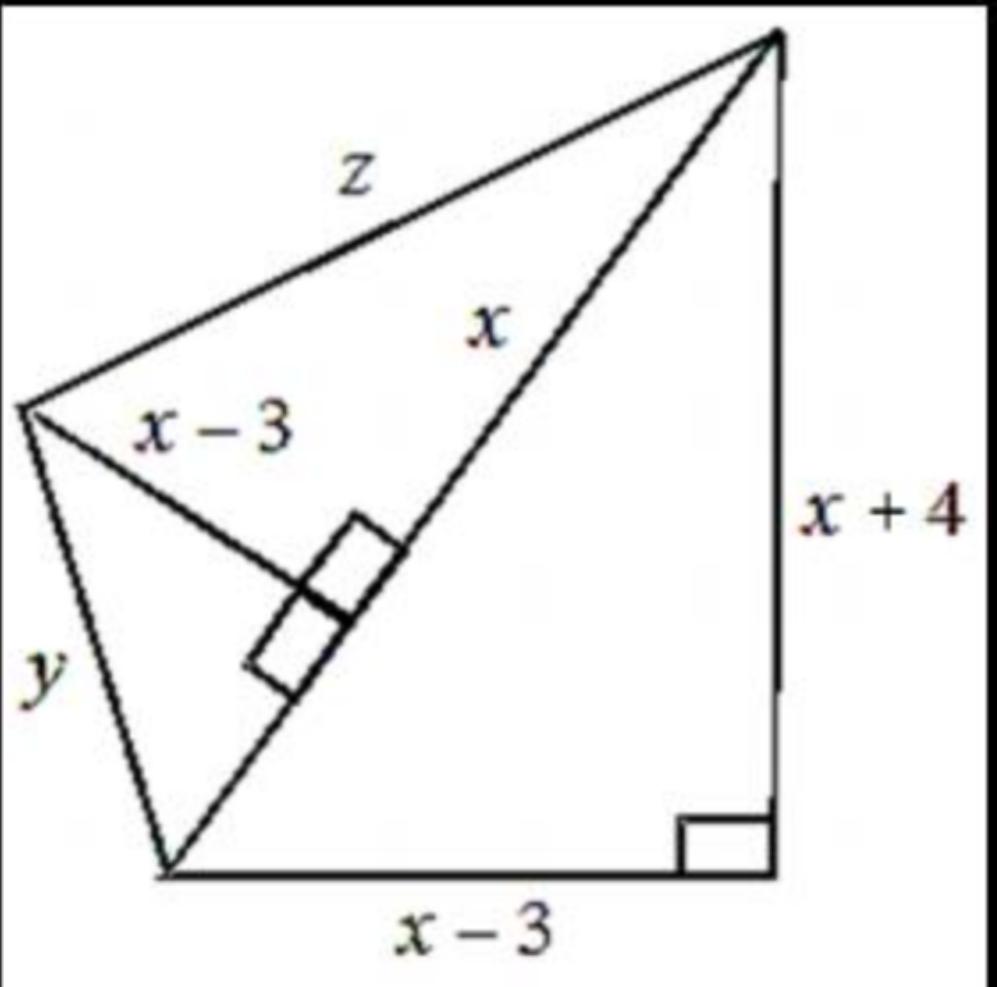
$$\Rightarrow BC^2 = AC \times DC$$

➤ $AD : CD = AB^2 : BC^2$

➤ $\triangle ADB : \triangle BDC = AB^2 : BC^2$

$$\text{➤ } \frac{1}{BD^2} = \frac{1}{AB^2} + \frac{1}{BC^2}$$

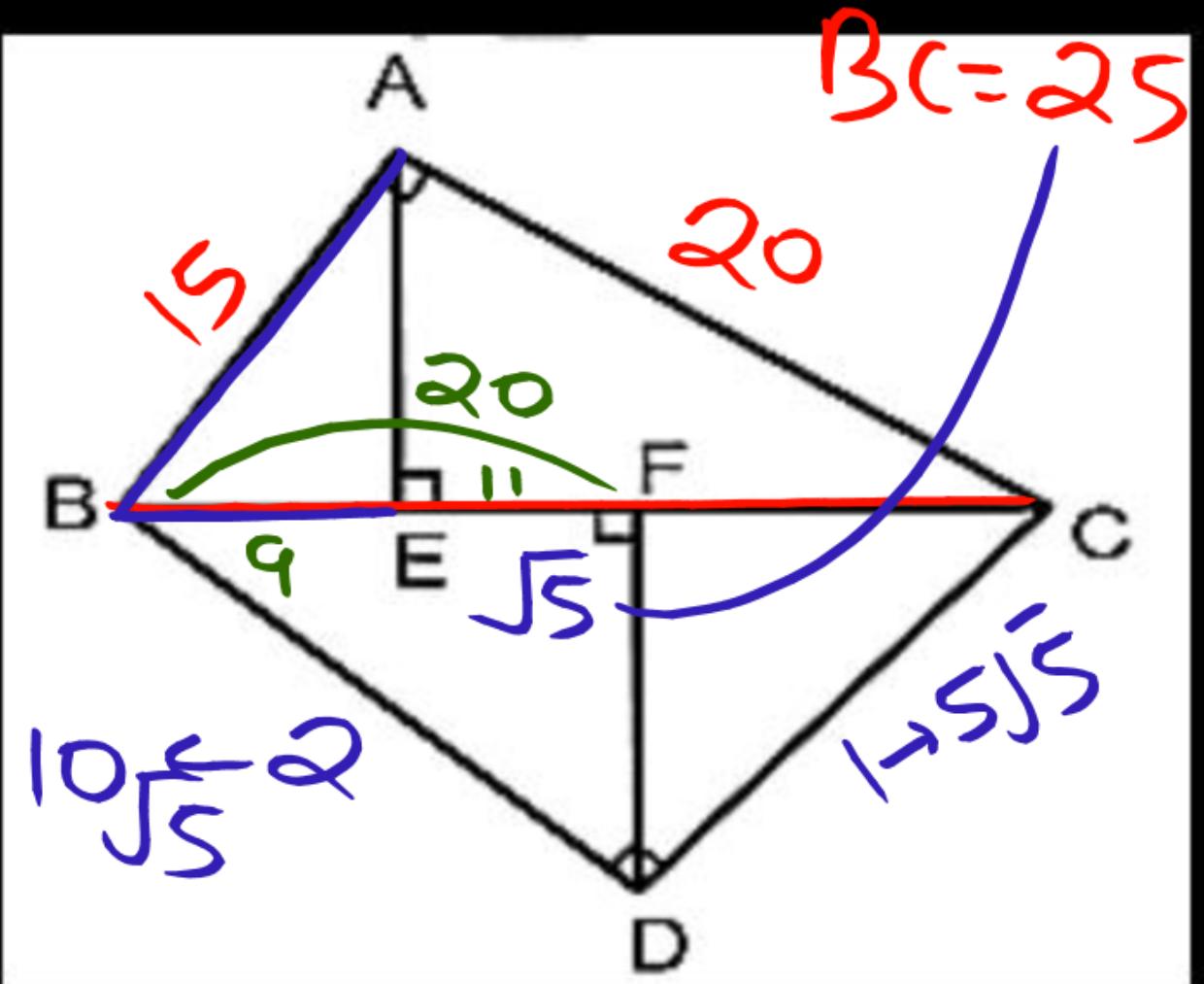




Based on the figure below, what is the value of x , if $y = 10$?

नीचे दिए गए चित्र के आधार पर, x का मान क्या है, यदि $y = 10$ है?

- (a) 10
- (b) 11
- (c) 12
- (d) None of these



$$BF = \frac{(10f_s)^2}{2S} = 20$$

In the given figure $AB = 15 \text{ cm}$, $AC = 20 \text{ cm}$ and if $BD = 2CD$ then find the value of $BE + FC - EF = ?$
 दिए गए चित्र में $AB = 15 \text{ cm}$, $AC = 20 \text{ cm}$ और यदि $BD = 2CD$ तो $BE + FC - EF$ का मान ज्ञात कीजिये?

- (a) 3

$$\left(\frac{15}{25}\right)^2 + \left(\frac{15\sqrt{3}}{25}\right)^2$$

$$9 + 5 - 11 = 3$$

- (d) 1

$$1 - \sqrt{5} \cdot S$$

ℓ

पृष्ठा In ADC

$$4R^2 + R^2 = (5\sqrt{5})^2 = RS$$

$$R^2 = 2S \quad R = S$$

$$\text{AE : EC} = AD : CD^2$$

$4 : 1$

$$AD : CD = 2 : 1$$

In the given figure $AE = 4\sqrt{5}$, $EC = \sqrt{5}$ then find the value of BD?

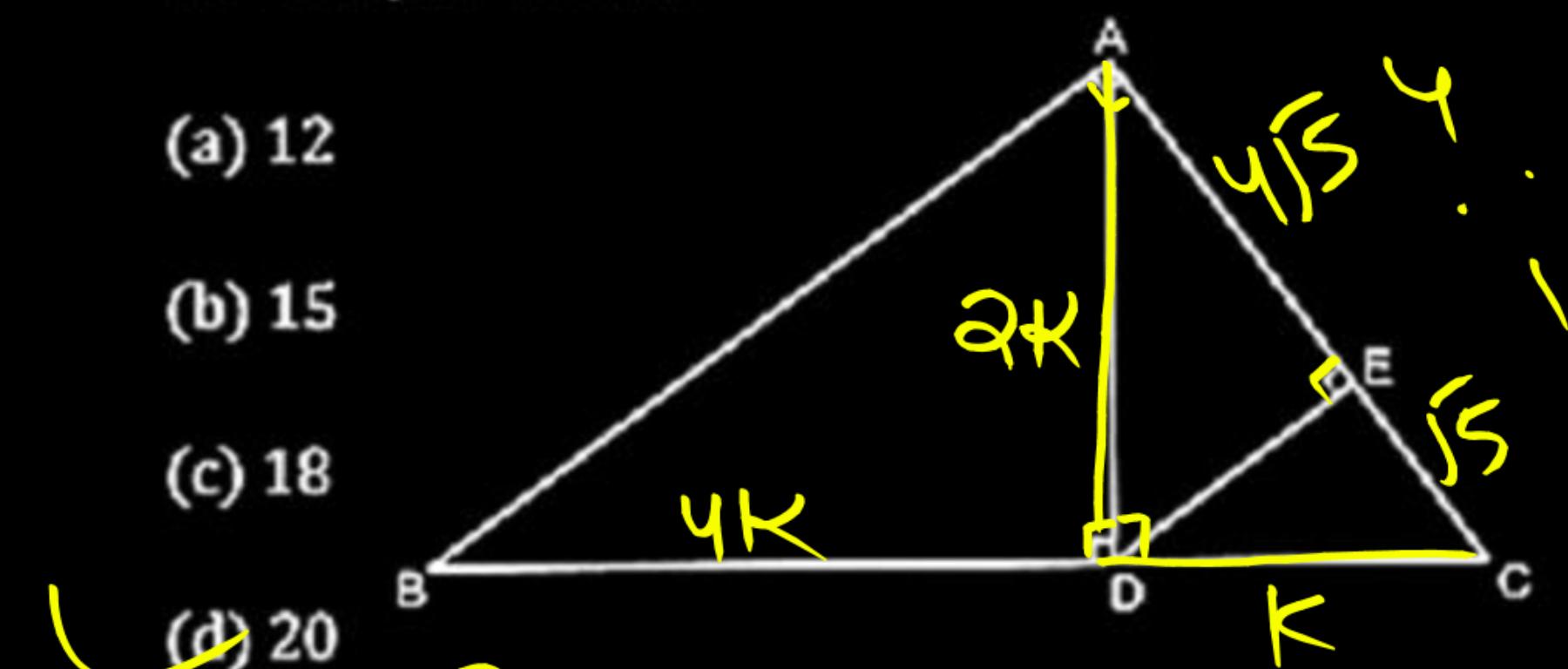
दिए गए चित्र में $AE = 4\sqrt{5}$, $EC = \sqrt{5}$ तो BD का मान शात कीजिये?

(a) 12

(b) 15

(c) 18

(d) 20

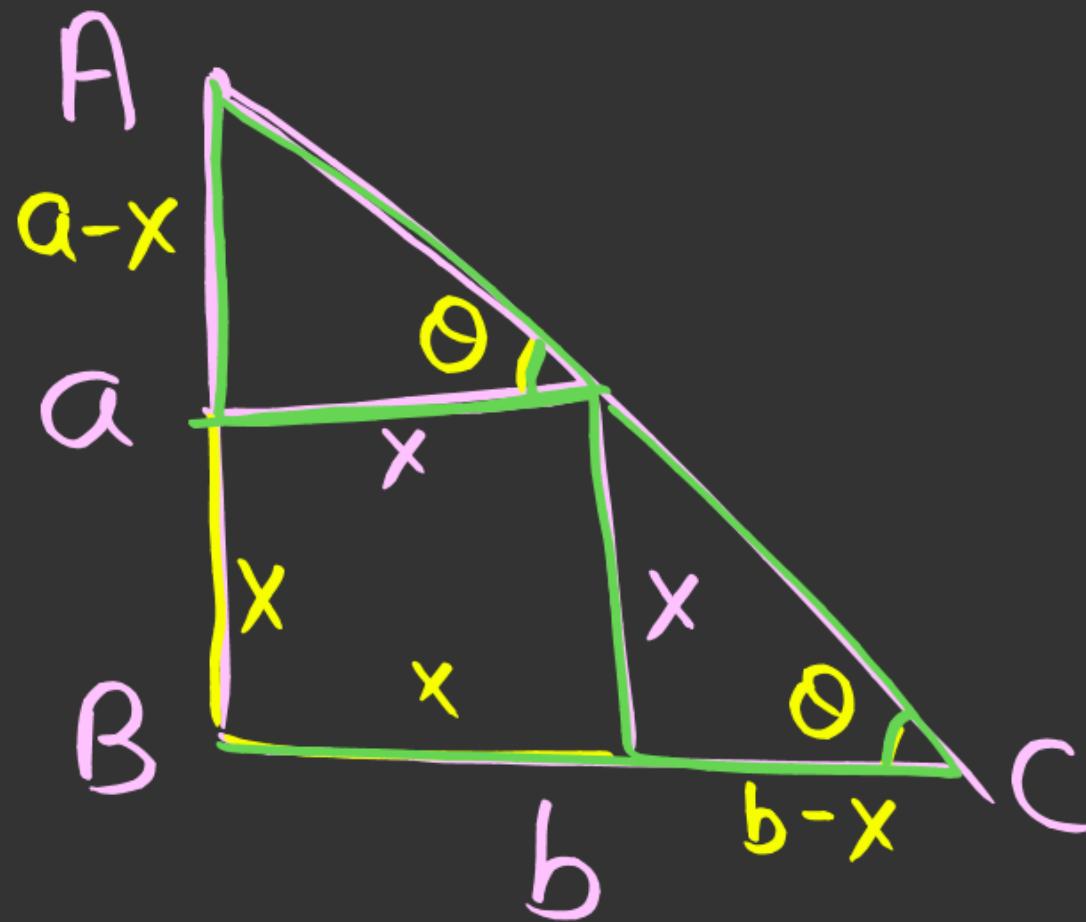


$$AD^2 = BD \cdot 4$$

$$4R^2 = BD \cdot R$$

$$BD = 4R = 20$$

Square in right angle Δ. (समकोण त्रिभुज में वर्ग)

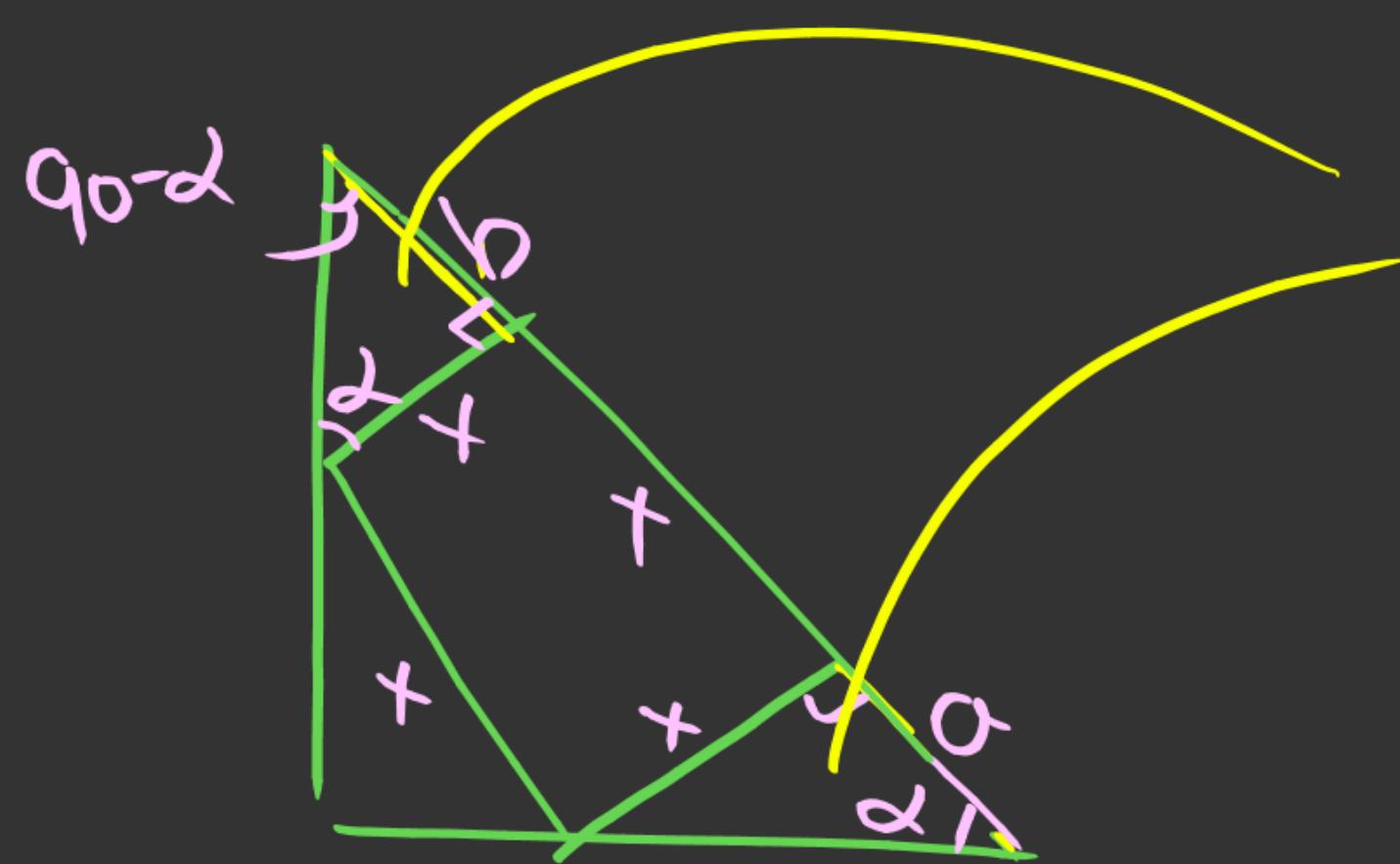


$$\tan \theta = \frac{a-x}{x} = \frac{x}{b-x}$$

$$ab - xb - ax + x^2 = xy$$

$$ab = x(a+b)$$

$$x = \frac{ab}{a+b}$$



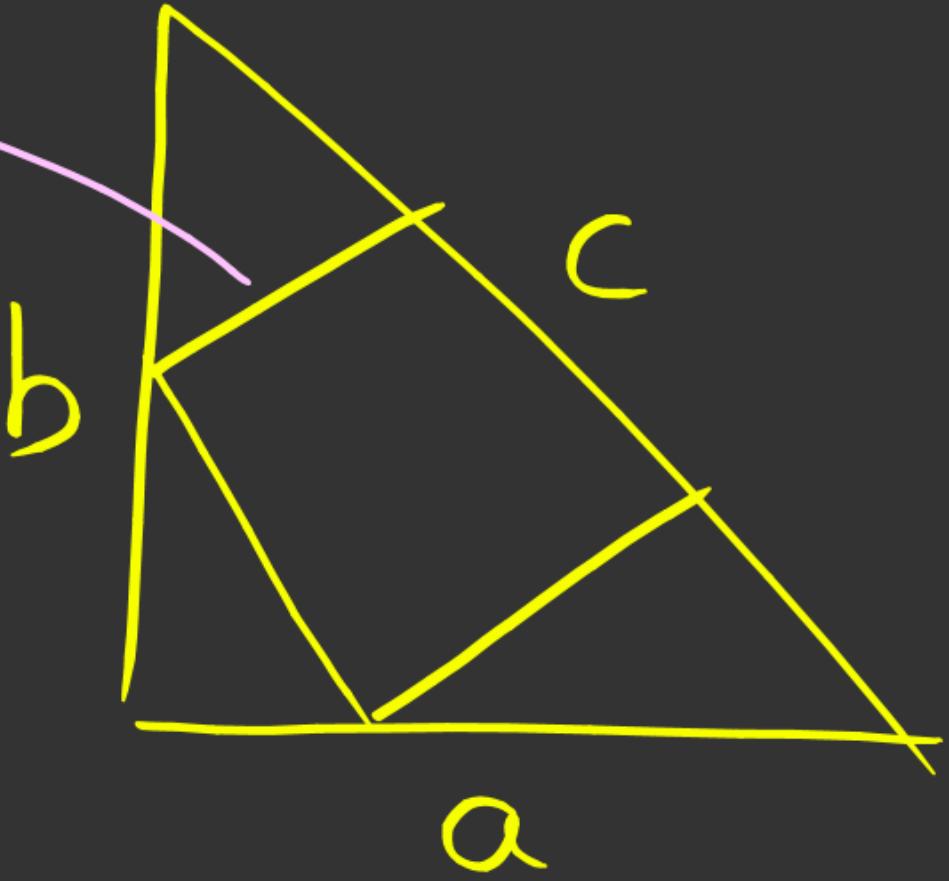
$$\tan \alpha = \frac{b}{x} = \frac{x}{a}$$

$$x^2 = ab$$

$$x = \sqrt{ab}$$

=====

Side of Sq=?



Side of Square

$$x = \frac{abc}{\underline{\underline{a^2 + b^2 + ab}}} = \frac{abc}{(a+b)^2}$$

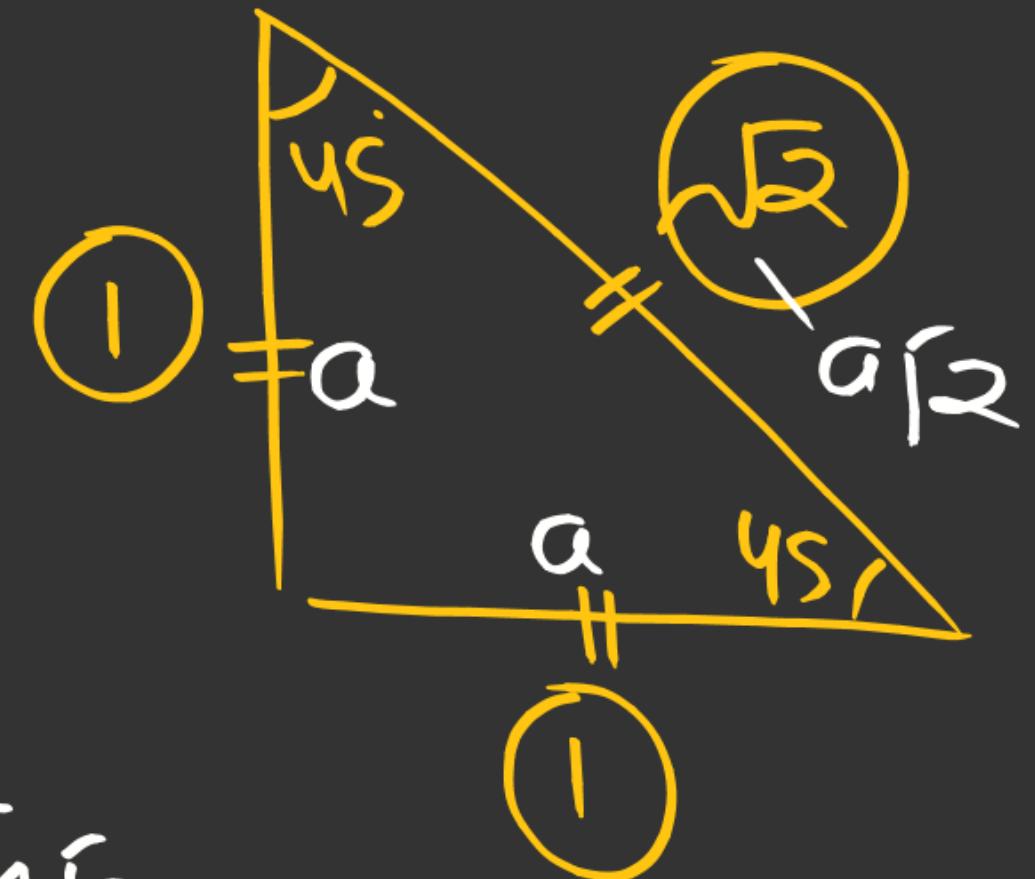
I Soceles right angle Δ. (समद्विभाग समकोण त्रिकोण)

perimeter $P \Rightarrow$ area = ?

$$P = a + a + a\sqrt{2}$$

$$a = \frac{P}{2 + \sqrt{2}} \quad \text{area} = \frac{1}{2} a^2 = \frac{1}{2} \cdot \frac{P^2}{(2 + \sqrt{2})^2}$$

$$= \frac{P^2}{4 + 4\sqrt{2}} = \frac{P^2}{4(3 + 2\sqrt{2})} \cdot \frac{3 - 2\sqrt{2}}{3 - 2\sqrt{2}} = \frac{P^2}{4}(3 - 2\sqrt{2})$$



Request - Revise.

30 min - Questions

1hr - main point