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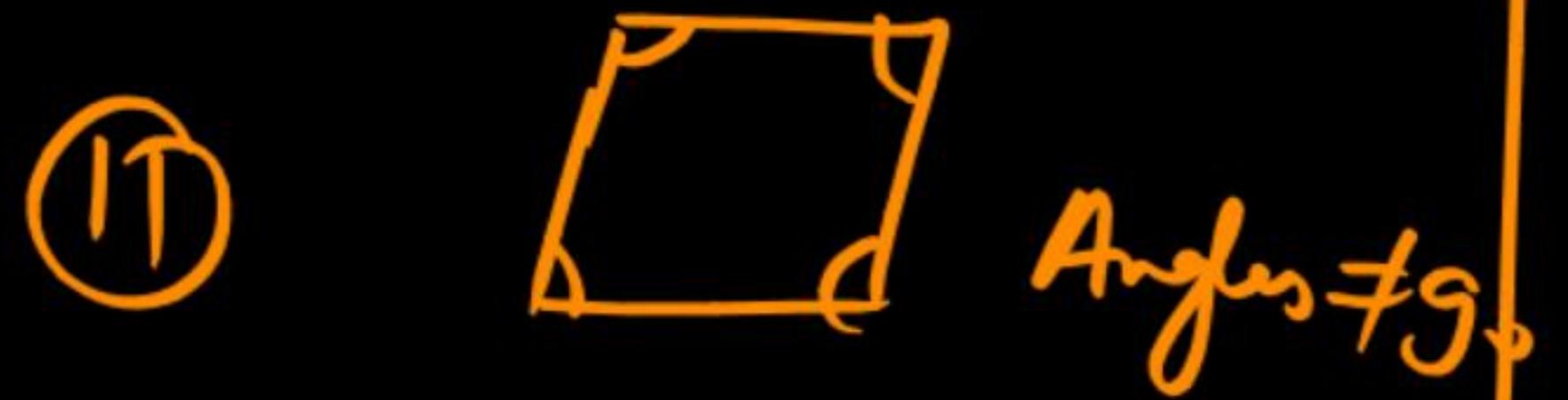
Puneet Chaudhary  
*Your Maths expert*



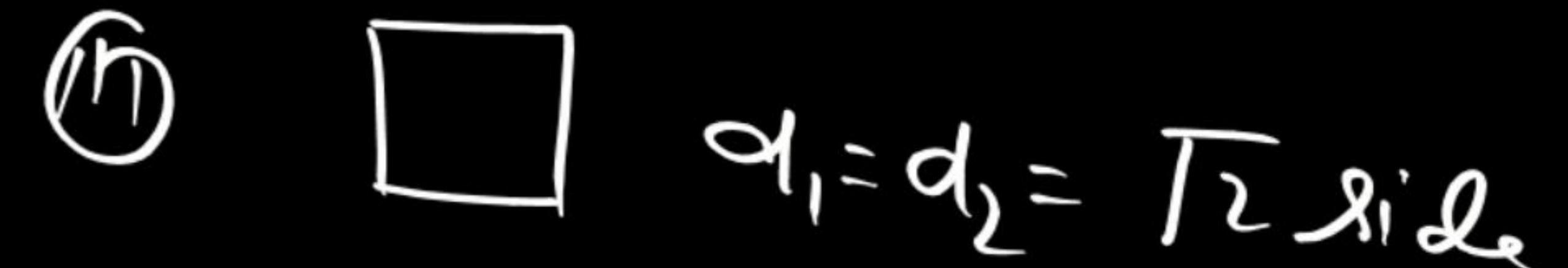
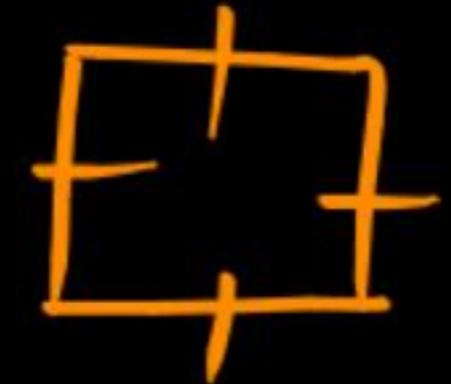
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Supercoaching

## Rhombus (ରୁମ୍ବୁସ)



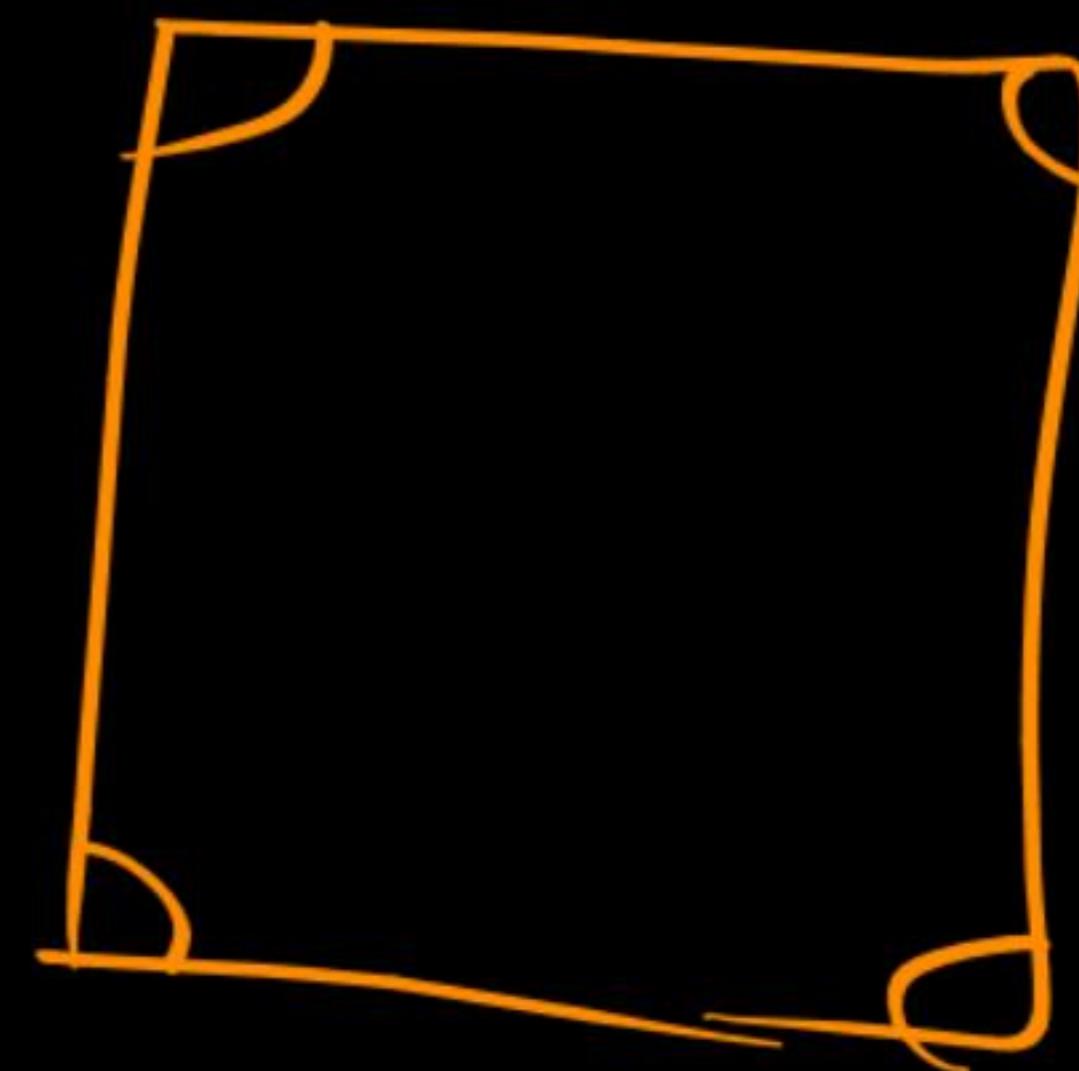
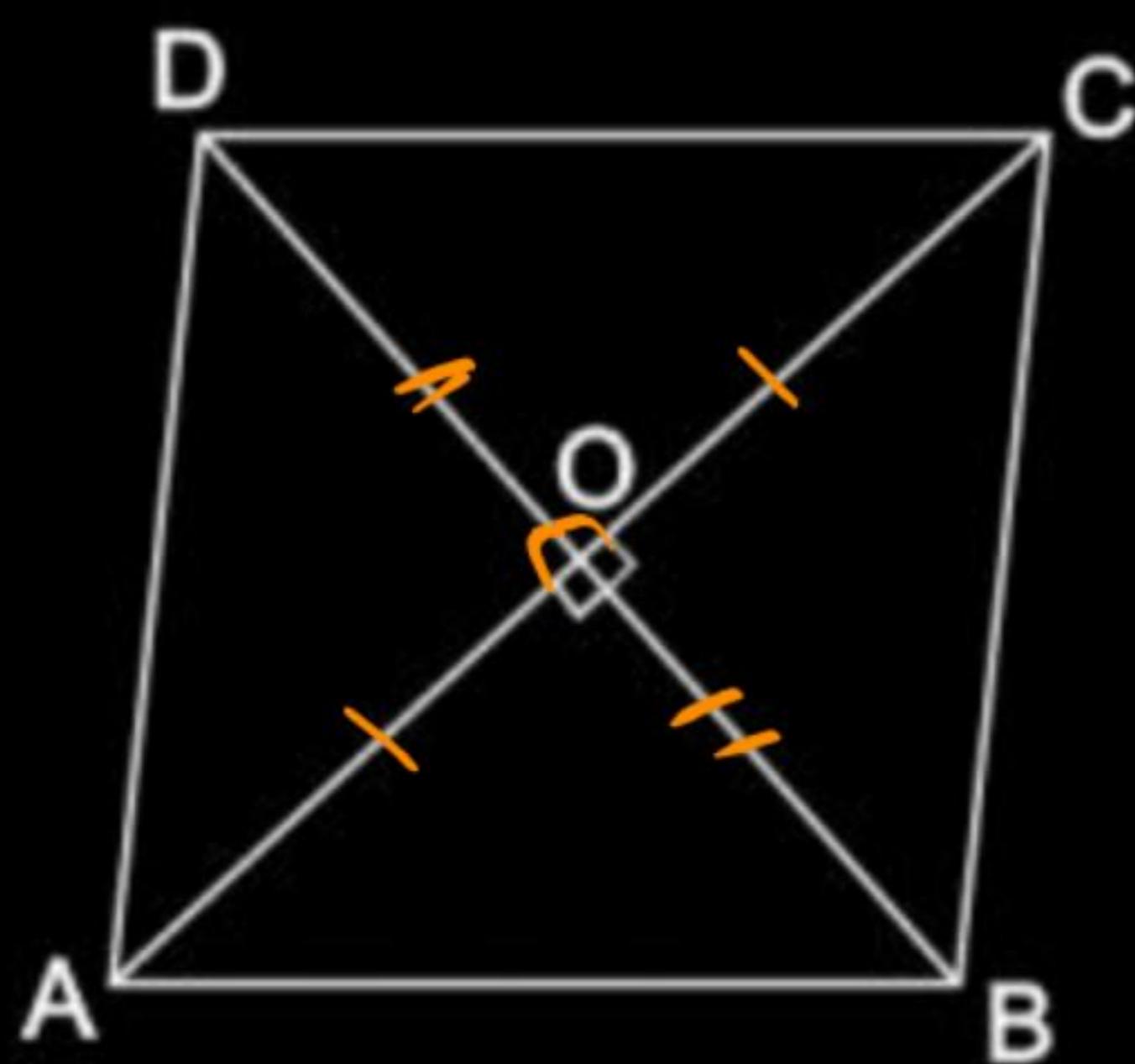
## Square କବିତା



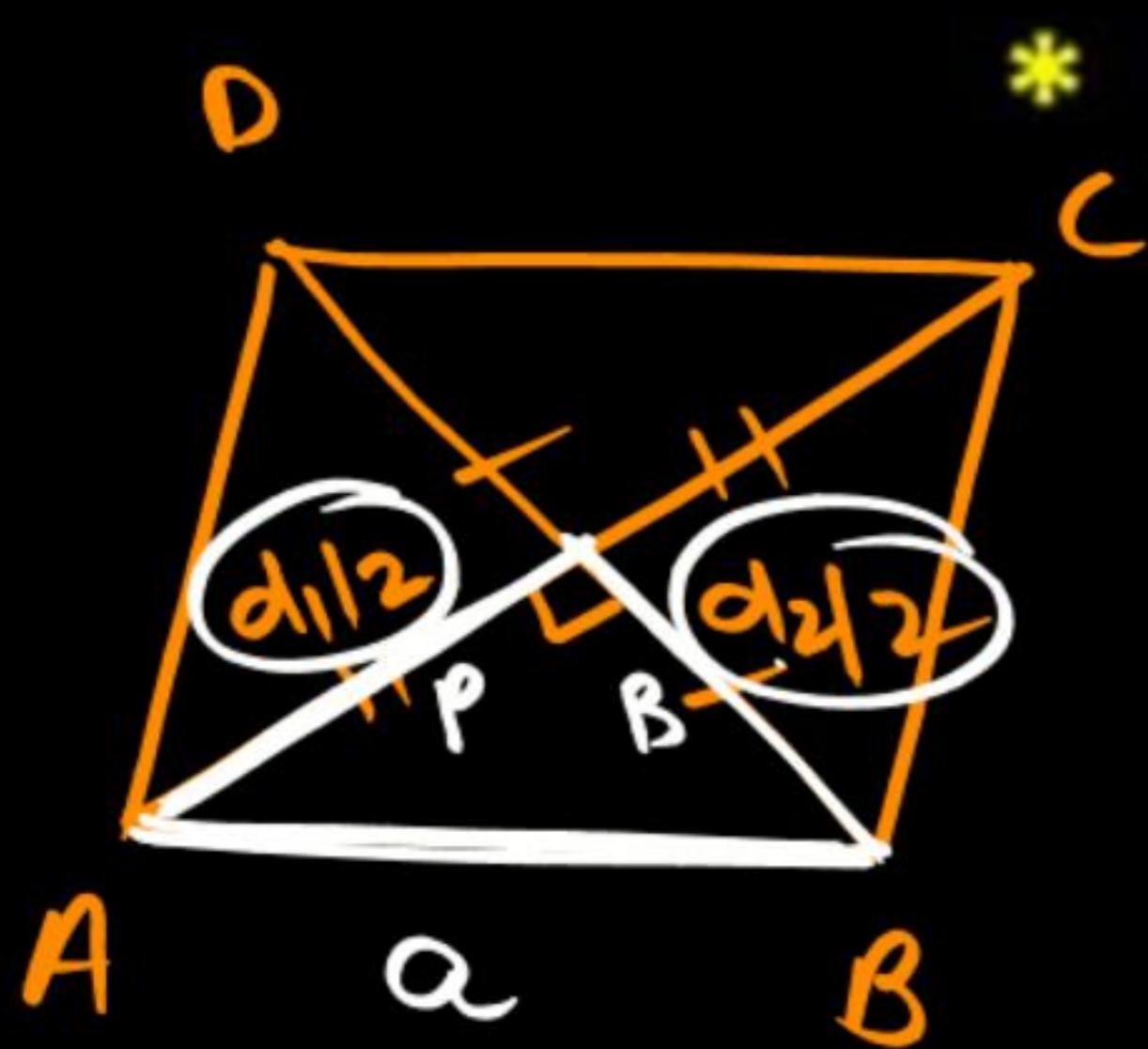
It is a quadrilateral parallelogram whose all sides are equal and parallel.

यह एक चतुर्भुज समांतर चतुर्भुज है जिसकी सभी भुजाएँ समान और समानांतर हैं।

- \* Both diagonals are different. ( $d_1 \neq d_2$ )
- \* Diagonals bisects each other at  $90^\circ$



- \* Angles  $\neq 90^\circ$



$$\text{Area} = \frac{1}{2} \times d_1 \times d_2$$

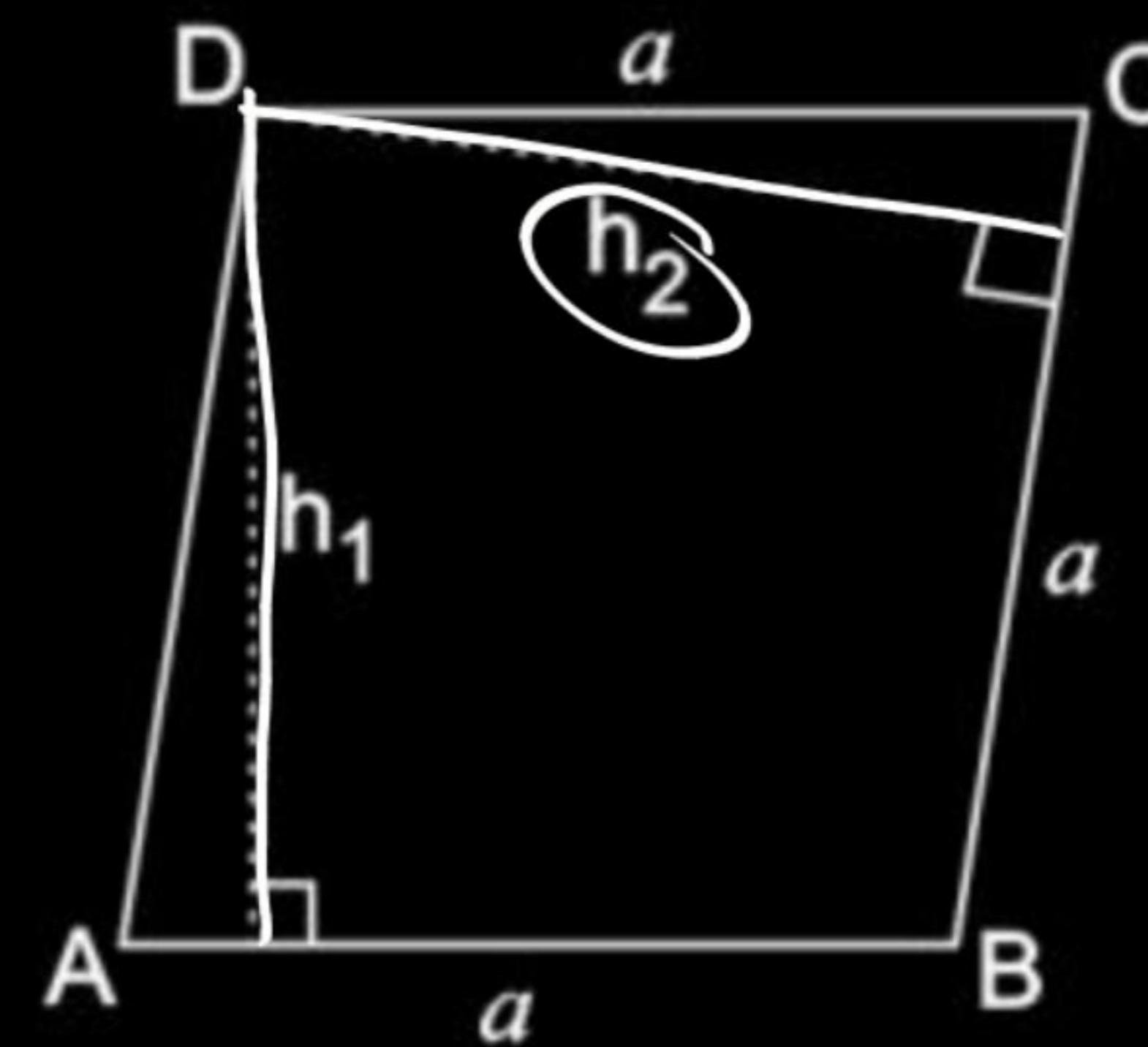
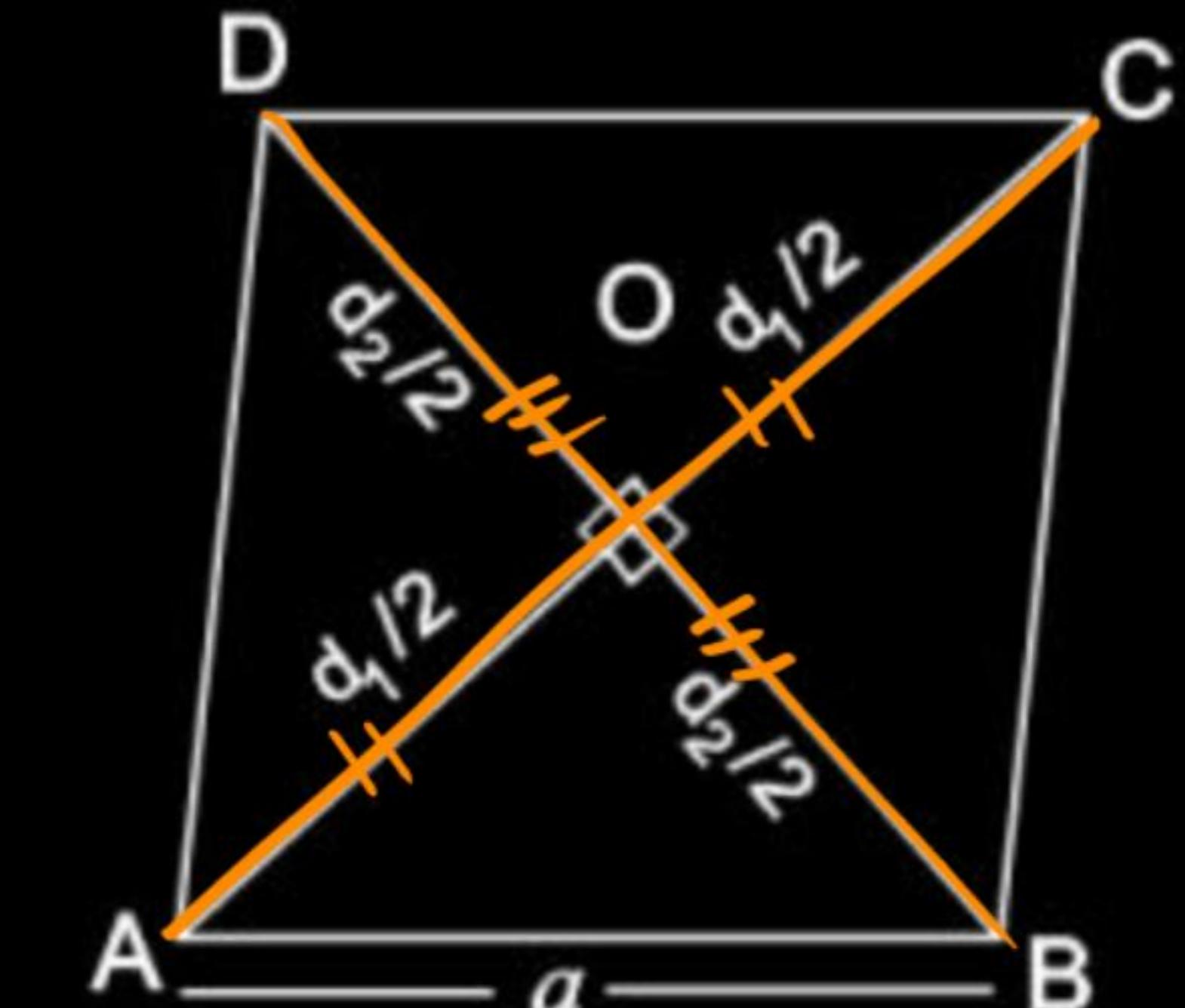
$$a^2 = \frac{d_1^2}{4} + \frac{d_2^2}{4}$$

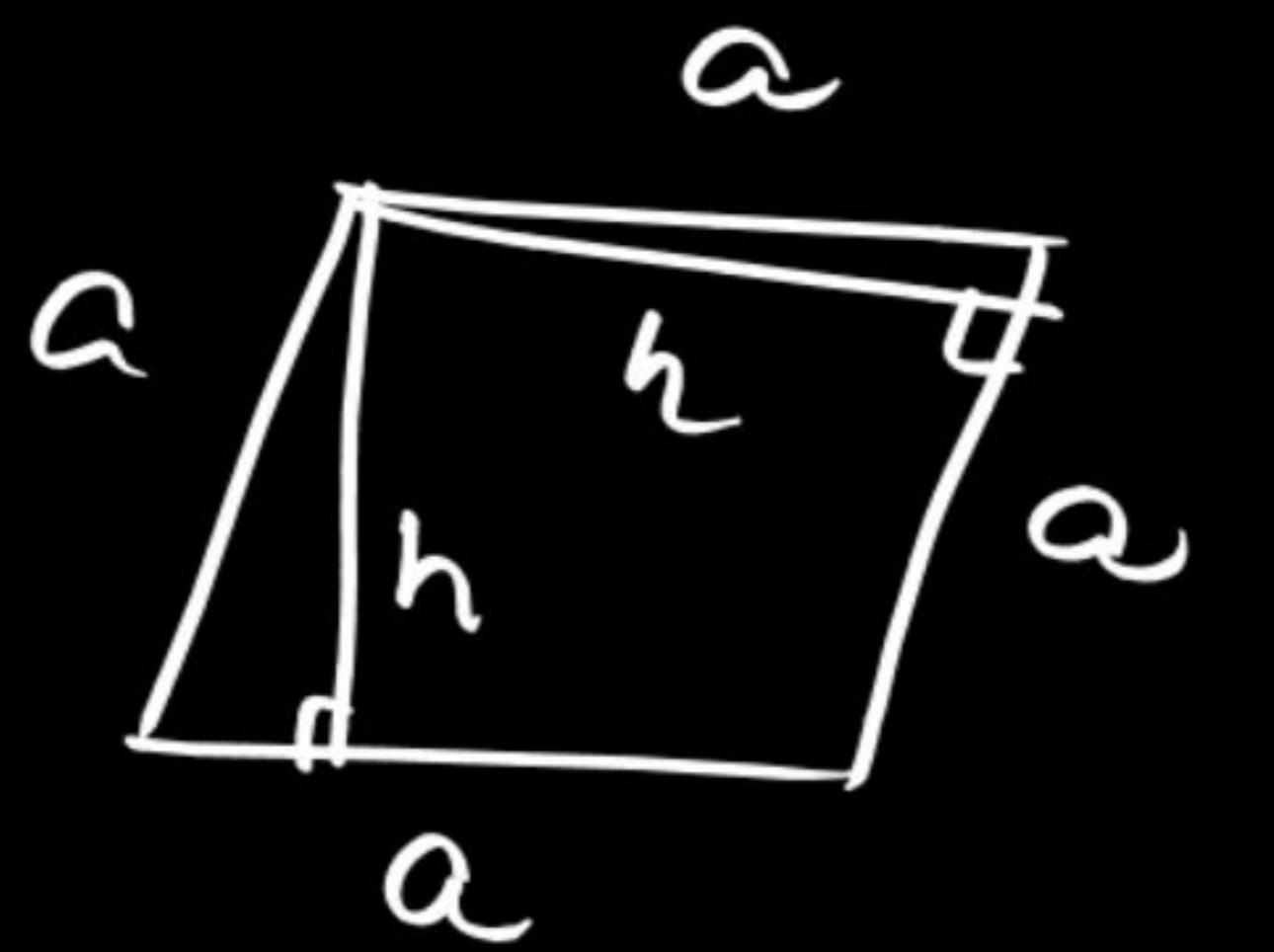
$$a^2 = \frac{d_1^2}{4} + \frac{d_2^2}{4}$$

$$a = \sqrt{\frac{d_1^2 + d_2^2}{2}}$$

$$(side) \quad a = \frac{1}{2} \sqrt{d_1^2 + d_2^2}$$

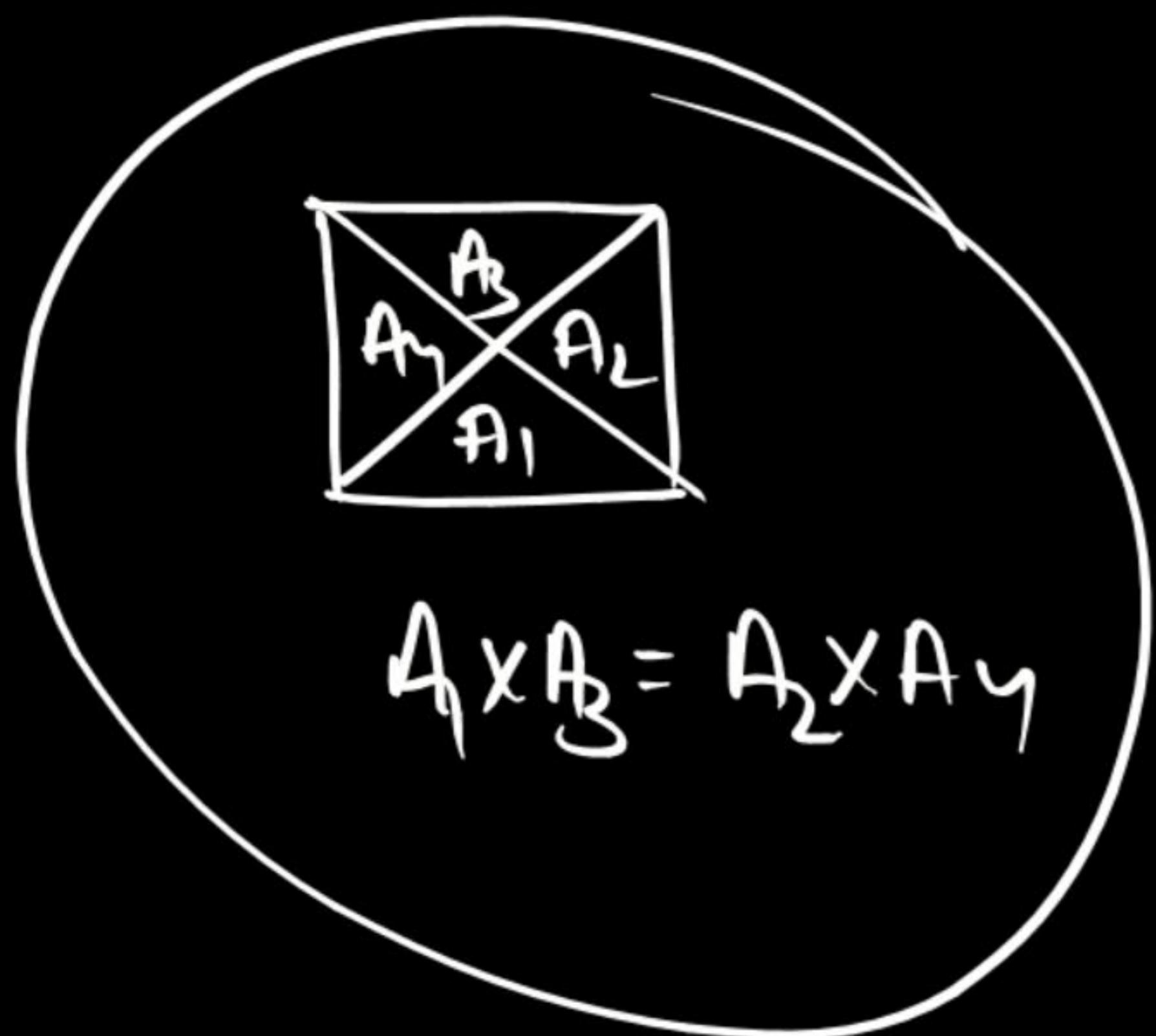
$$h_1 = h_2$$



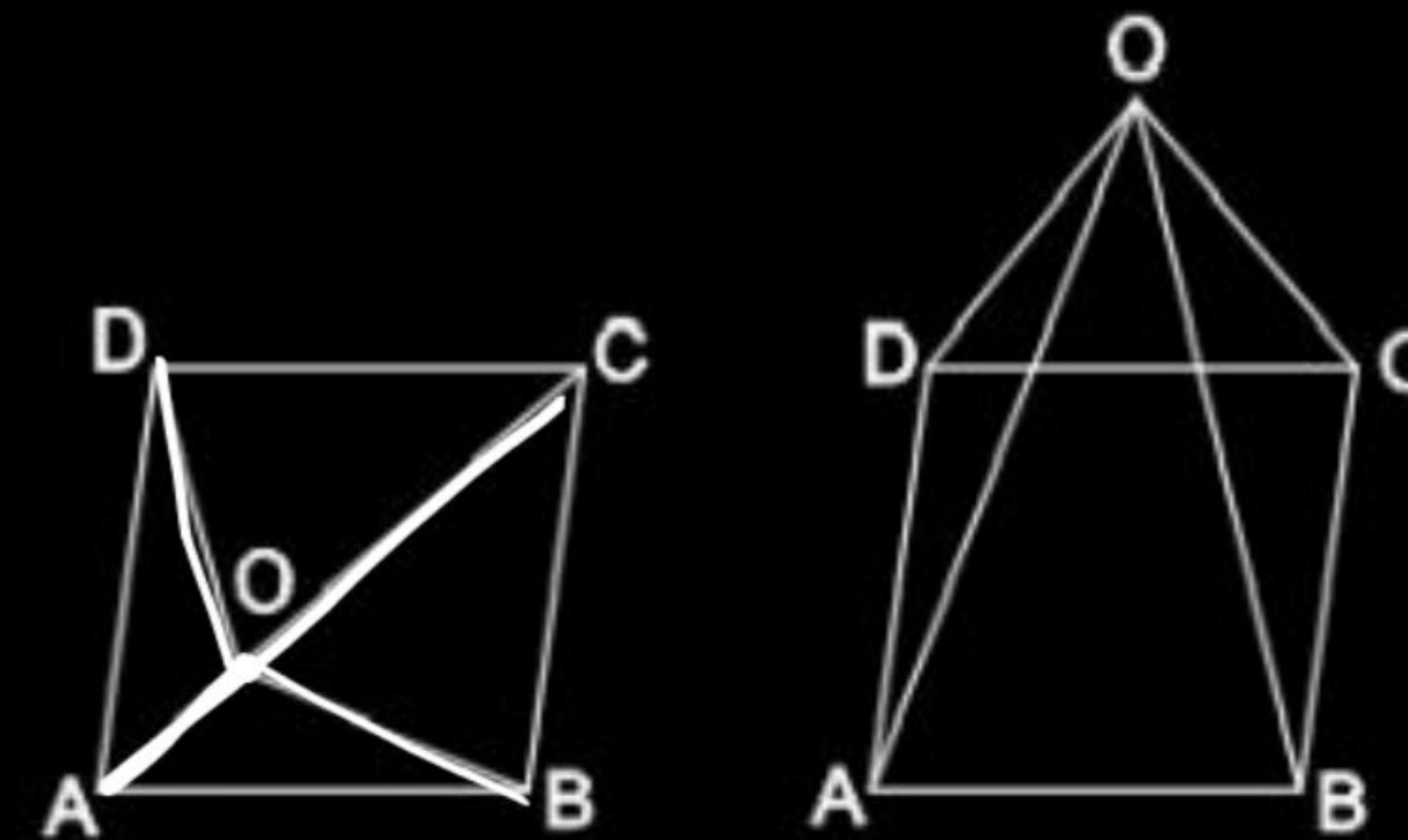


$$A = B \times h$$

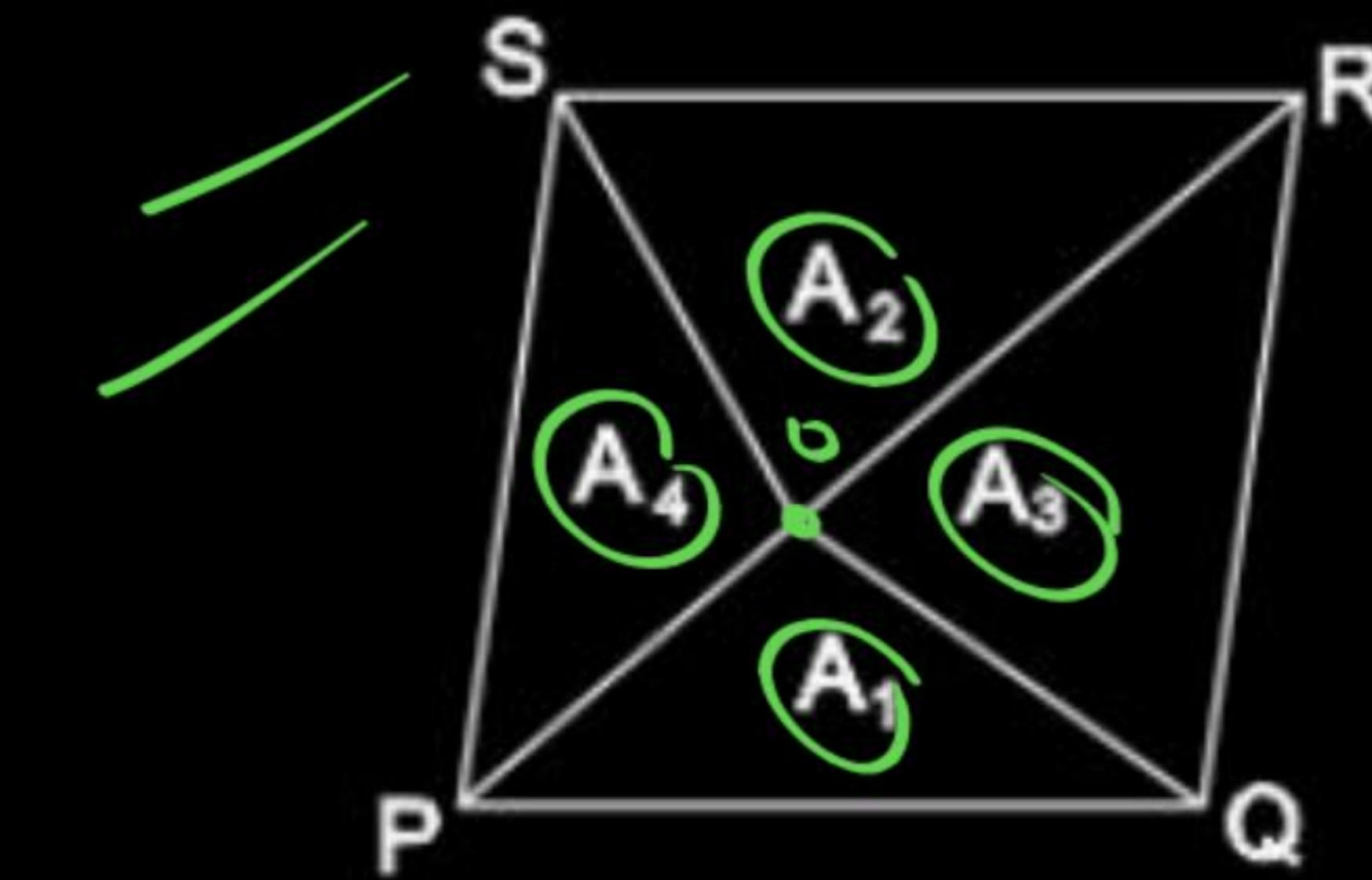
$$= \textcircled{a} \times h$$



|||



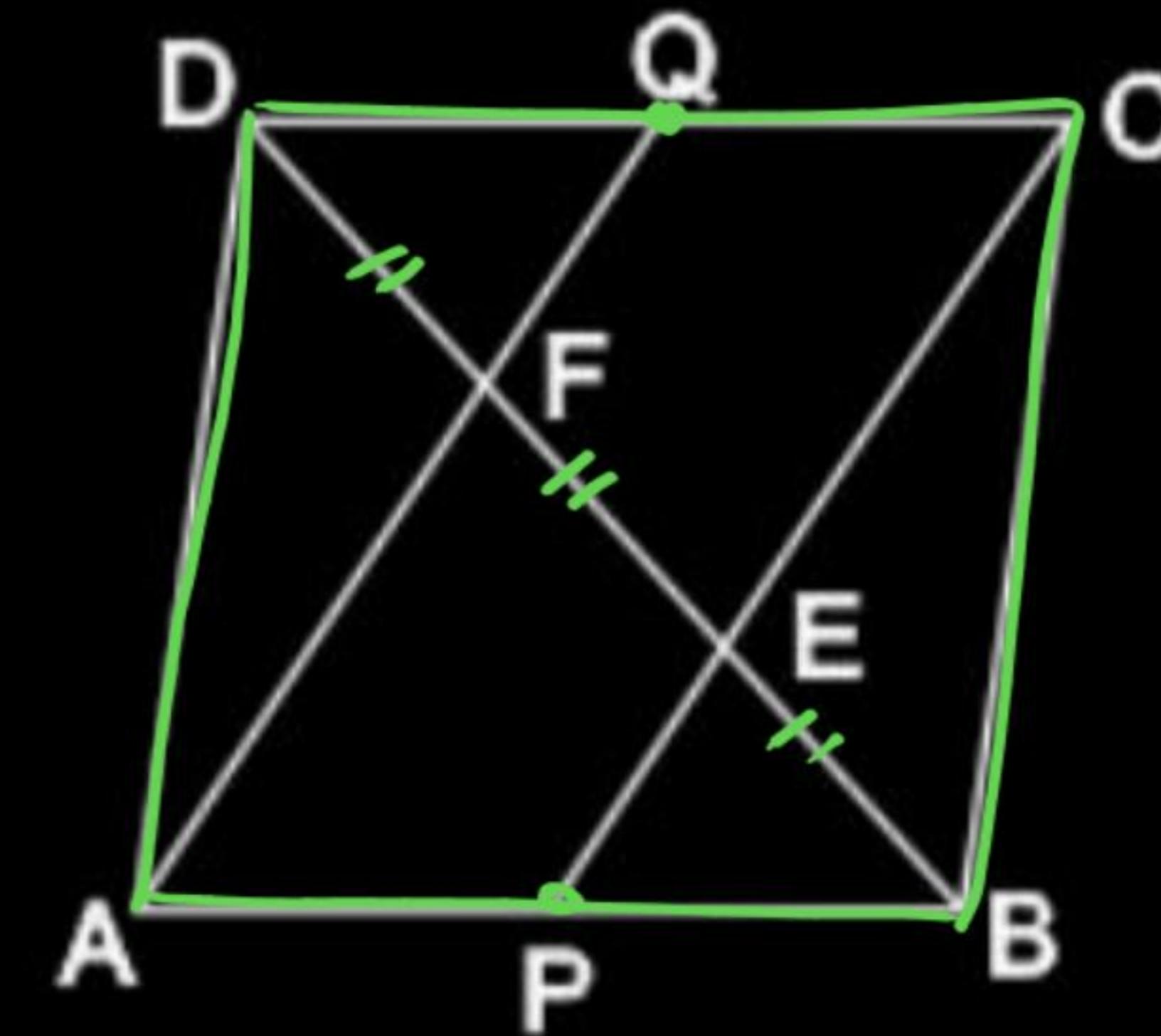
$$OA^2 + OC^2 = OB^2 + OD^2$$



$$A_1 + A_3 = A_2 + A_4$$

\*

Diagonals behaves like angular bisector.



P, Q are midpoints.

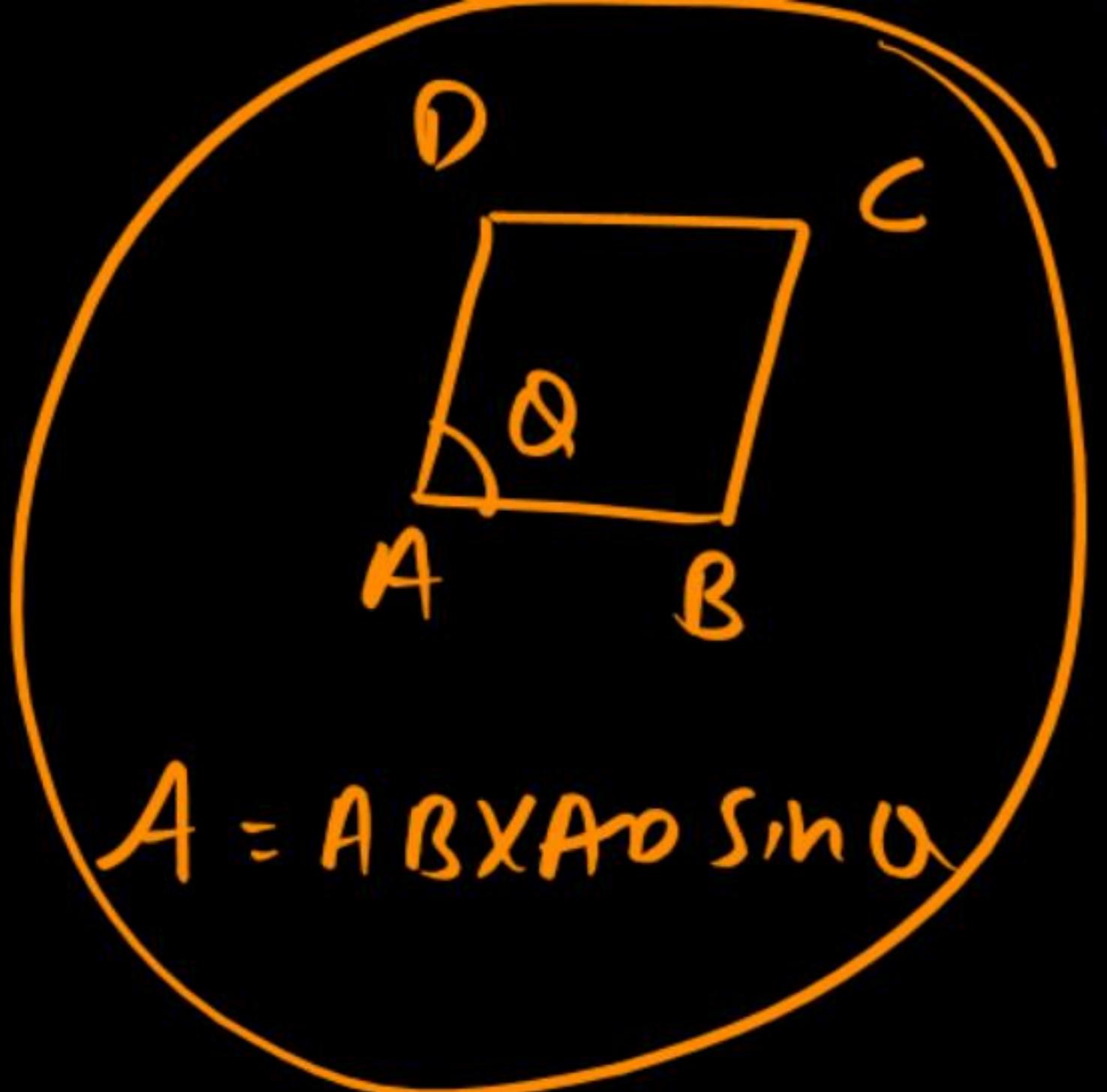
$$BE = EF = FD$$

- \* If the diagonals of a rhombus are  $d_1$  and  $d_2$  then find the side of that rhombus, and height of that rhombus.

यदि एक समचतुर्भुज के विकर्ण  $d_1$  और  $d_2$  हैं तो उस समचतुर्भुज की भुजा और उस समचतुर्भुज की ऊँचाई ज्ञात कीजिए।

$$\text{Side} = \frac{1}{2} \sqrt{d_1^2 + d_2^2}$$

$$\text{Height} = \frac{d_1 d_2}{\sqrt{d_1^2 + d_2^2}}$$

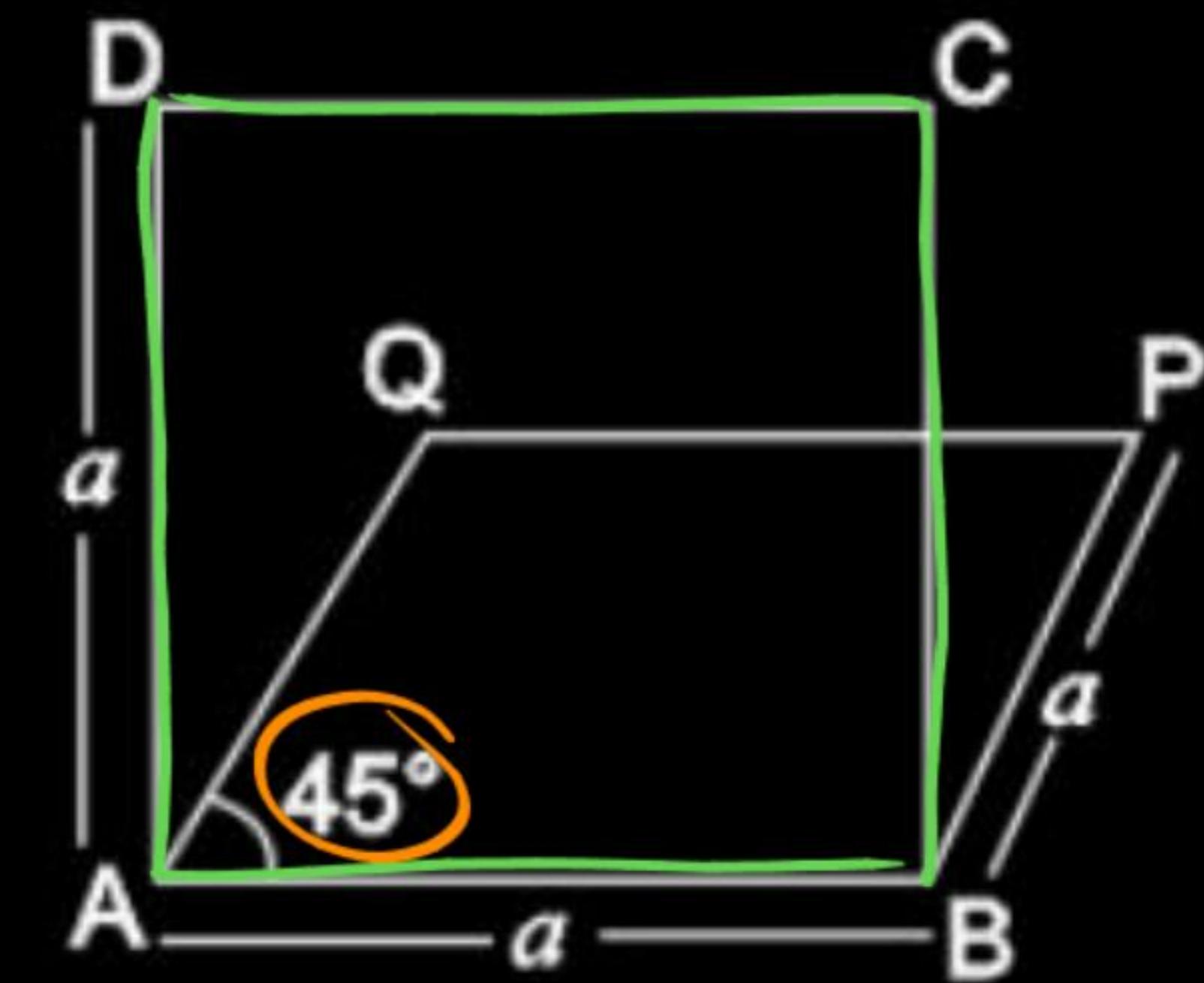


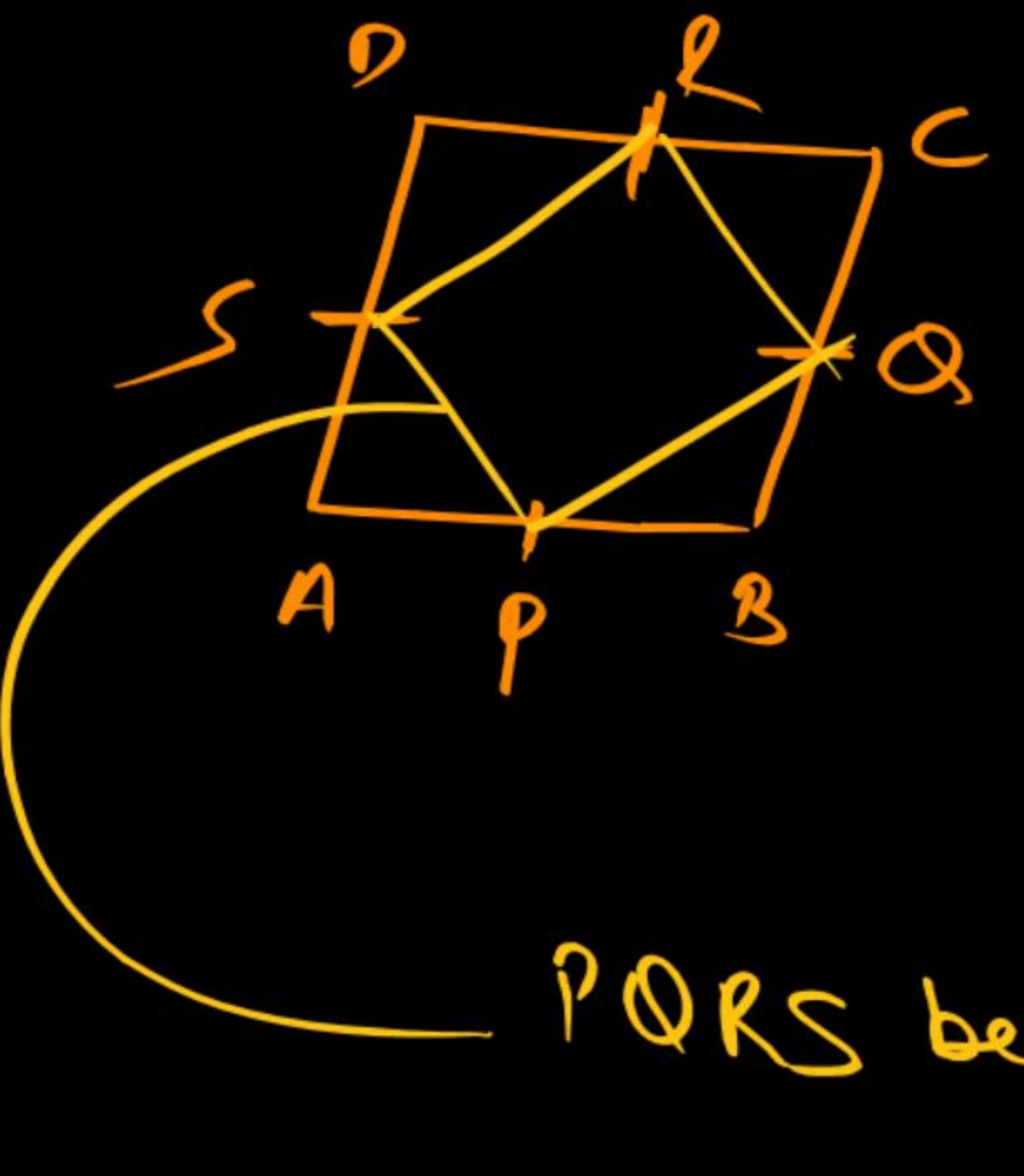
$$A = AB \times AD \sin \alpha$$

30. ABCD is a square and ABPQ is a rhombus. Then find  $\text{ar(ABCD)} : \text{ar(ABPQ)}$ .

ABCD एक वर्ग है और ABPQ एक समचतुर्भुज है। तो  $\text{ar(ABCD)} : \text{ar(ABPQ)}$  ज्ञात कीजिए।

$$\begin{aligned} & a^2 : a \times a \times \sin 45^\circ \\ & \cancel{a^2} : \cancel{a^2} \times \frac{1}{\sqrt{2}} \\ & \boxed{\sqrt{2} : 1} \end{aligned}$$





P, Q, R, S mid pt of sides

PQRS be a Rectangle

31.

If area of a rhombus is  $100 \text{ cm}^2$  and its perimeter is 56. Then find the sum of the diagonals.

यदि एक समचतुर्भुज का क्षेत्रफल  $100$  सेमी $^2$  है और उसका परिमाप  $56$  सेमी. है, तो उसके विकणों का योग ज्ञात कीजिए।

$$\text{Area} = 100 \text{ cm}^2$$

$$\text{Perimeter} = 56$$

$$\boxed{d_1 + d_2 = ?}$$

$$A = \frac{1}{2} \times d_1 \cdot d_2 = 100$$

$$\boxed{d_1 \times d_2 = 200}$$

$$4 \times \text{side} = 56$$

$$\text{side} = 14$$

$$\text{side} = \frac{1}{2} \sqrt{d_1^2 + d_2^2}$$

$$14 = \frac{1}{2} \sqrt{d_1^2 + d_2^2}$$

$$28 = \sqrt{d_1^2 + d_2^2}$$

$$784 = d_1^2 + d_2^2$$

$$(d_1 + d_2)^2 = d_1^2 + d_2^2 + 2d_1 \cdot d_2$$

$$(d_1 + d_2)^2 = 784 + 400$$

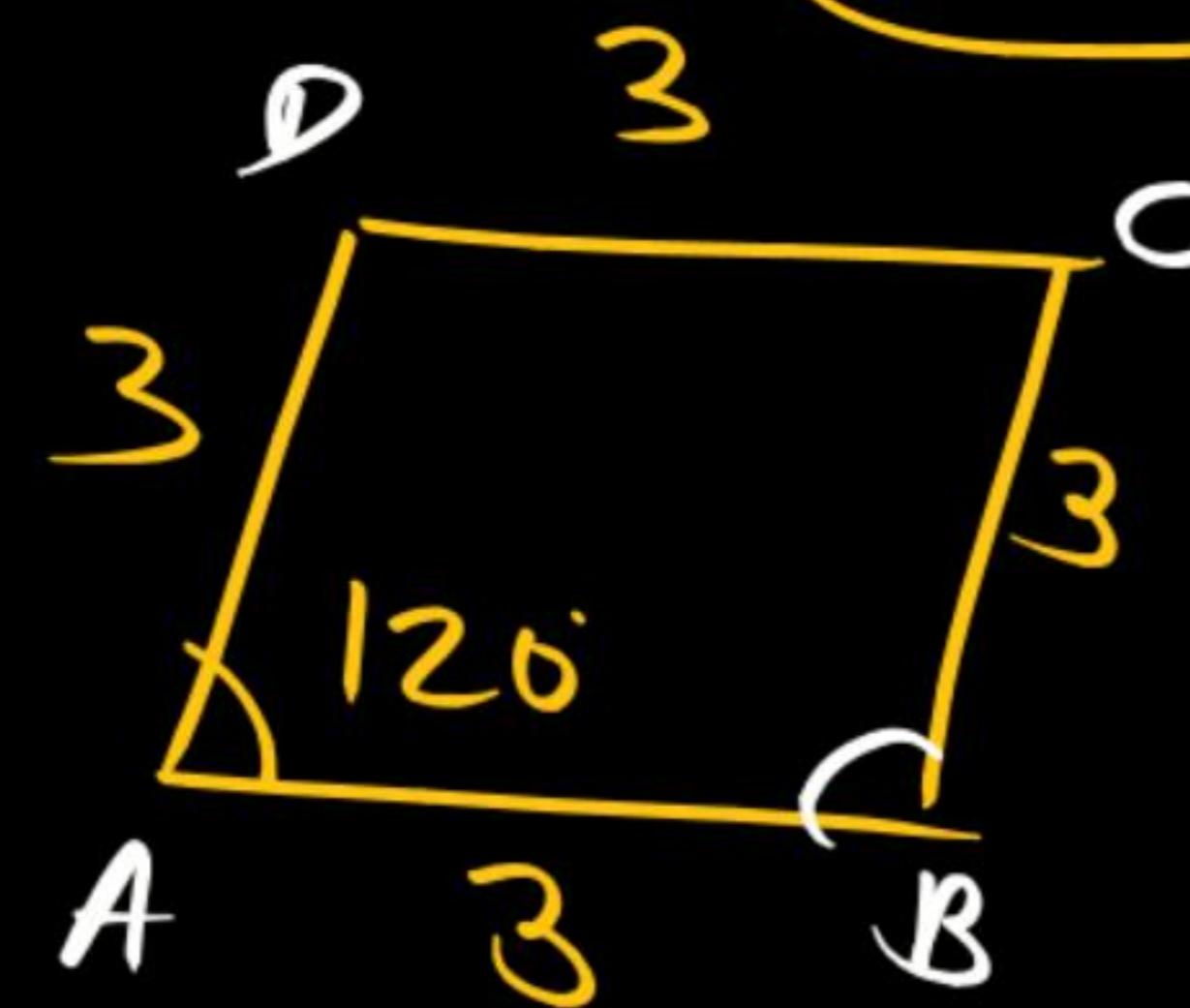
$$(d_1 + d_2)^2 = 1184$$

$$d_1 + d_2 = \sqrt{1184}$$

32. In a rhombus its perimeter is 12 cm and  $\angle A = 120^\circ$ ,  
Then find area of rhombus:

$$\text{side} = \frac{12}{4} = 3$$

एक समचतुर्भुज में इसका परिमाप 12 सेमी और  
 $\angle A = 120^\circ$  है, तो समचतुर्भुज का क्षेत्रफल ज्ञात कीजिए

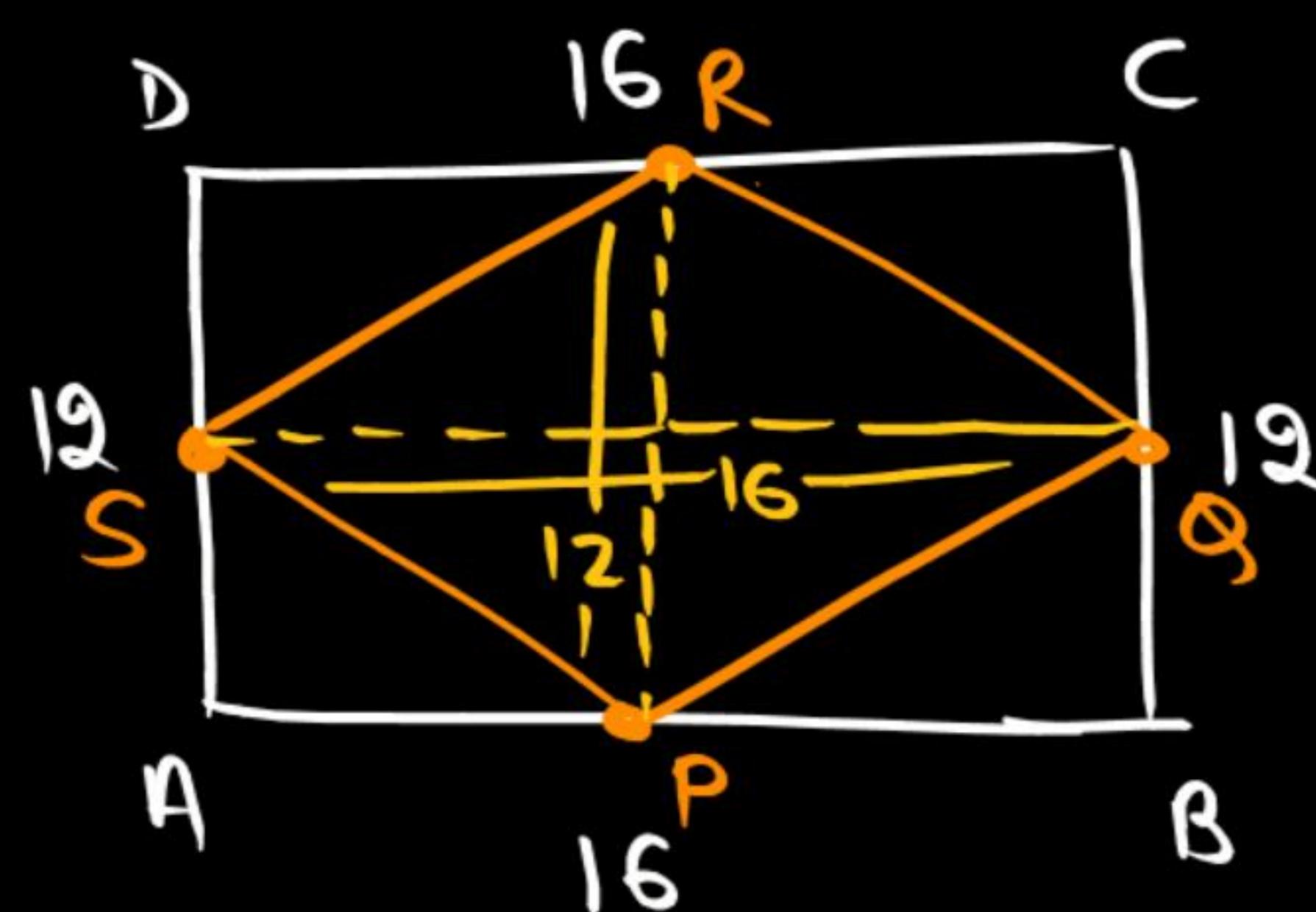


$$A = AB \times AD \times \sin(120^\circ)$$

$$= 3 \times 3 \times \sin 120^\circ$$

$$= 3 \times 3 \times \frac{\sqrt{3}}{2} = \frac{9\sqrt{3}}{2} \text{ cm}^2$$

33. ABCD is a rectangle whose sides are 16 and 12. P, Q, R, S  
are the midpoints of AB, BC, CD, DA respectively. Then  
find area of PQRS.

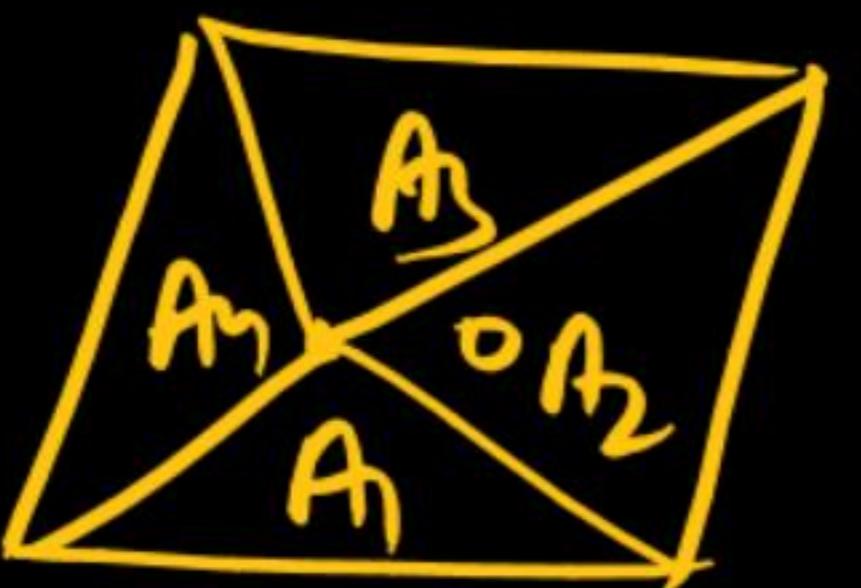


ABCD एक आयत है जिसकी भुजाएँ 16 और 12 हैं। P, Q, R, S क्रमशः AB, BC, CD, DA के मध्य बिंदु हैं। तो  
PQRS का क्षेत्रफल ज्ञात कीजिए।

↪ Rhombus

$$\begin{aligned} \text{Area of PQRS} &= \frac{1}{2} d_1 \cdot d_2 \\ &= \frac{1}{2} \times 12 \times 16 \\ &= 96 \text{ cm}^2 \end{aligned}$$

34. PQRS is a rhombus. Point A lies inside it. Given that area of  $\Delta PAQ = 21\text{cm}^2$ ,  $\text{ar}(\Delta QAR) = 48\text{cm}^2$ ,  $\text{ar}(\Delta PAS) = 27\text{cm}^2$ , then find  $\text{ar}(\Delta RAS)$ .

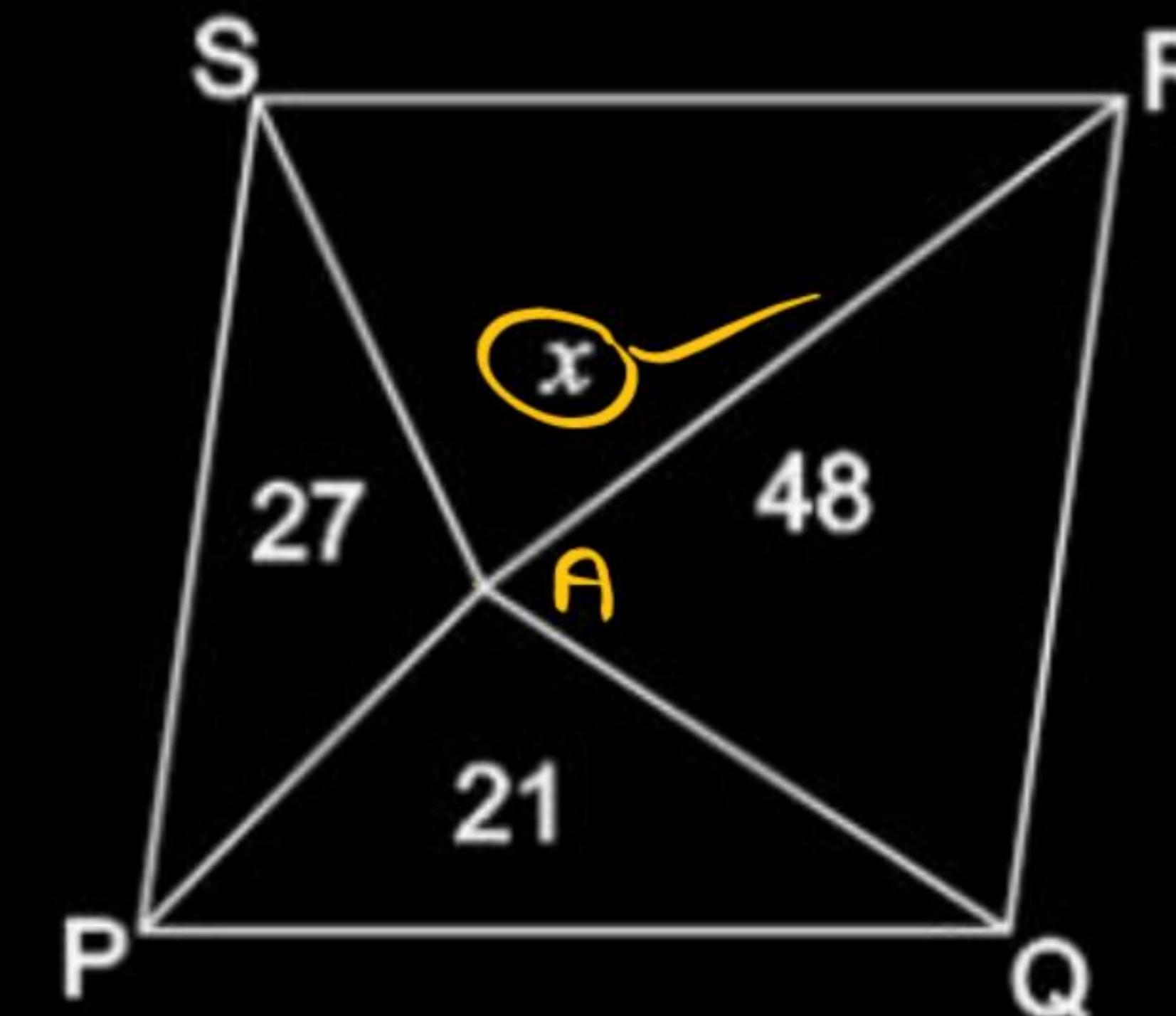


$$A_1 + A_3 = A_2 + A_4$$

PQRS एक समचतुर्भुज है। इसके अंदर एक बिंदु A स्थित है। दिया गया है कि क्षेत्रफल  $\Delta PAQ = 21\text{cm}^2$ ,  $\text{ar}(\Delta QAR) = 48\text{cm}^2$ ,  $\text{ar}(\Delta PAS) = 27\text{cm}^2$ , तो  $\text{ar}(\Delta RAS)$  ज्ञात कीजिए।

$$21 + x = 27 + 48$$

$$\begin{aligned}x &= 6 + 48 \\&= 54\text{cm}^2\end{aligned}$$

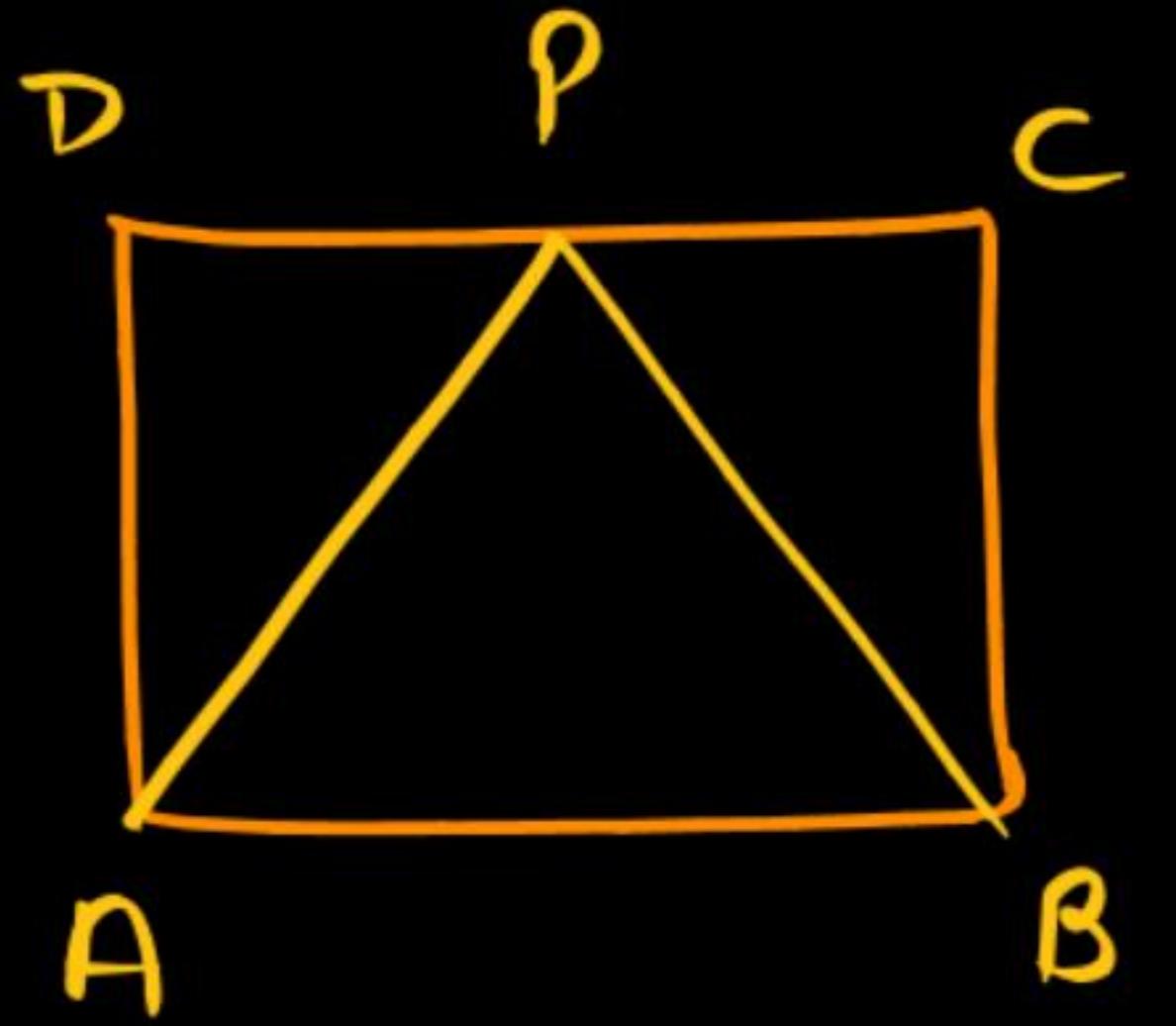


Square

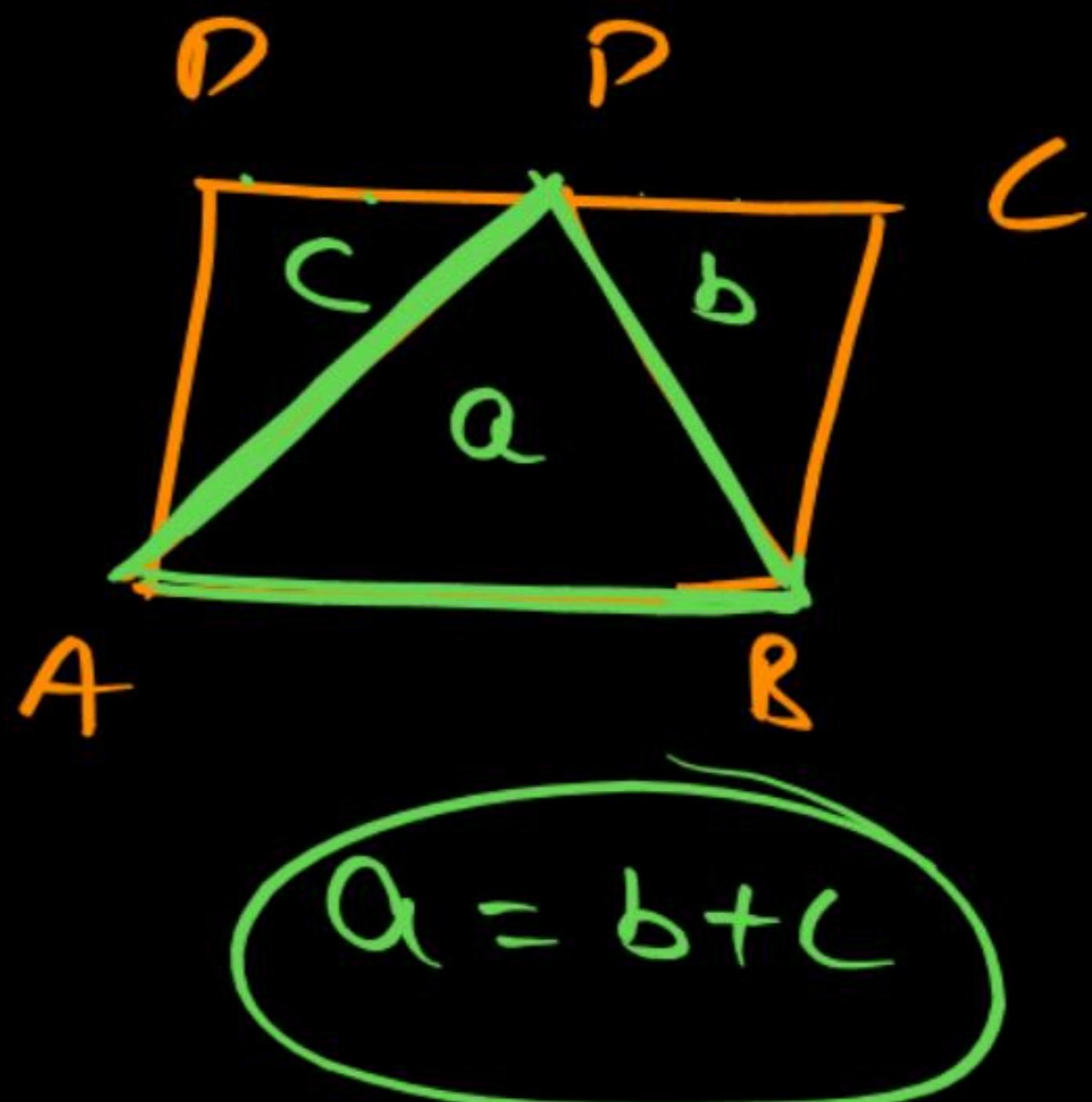
Rectangle

11 gm

Rhombus

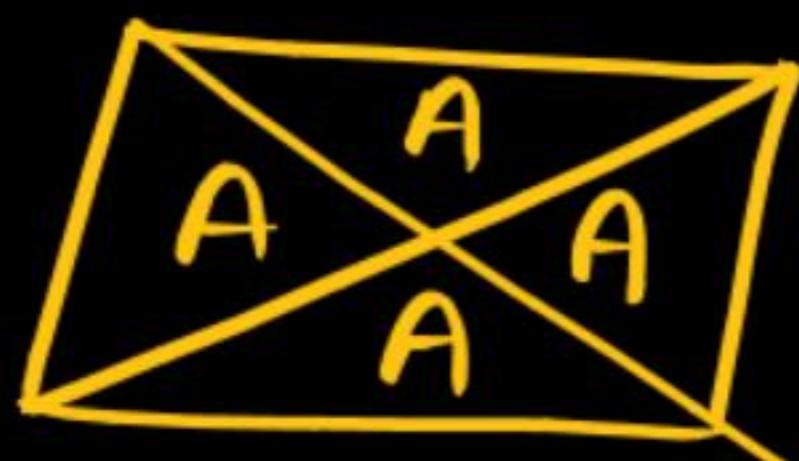
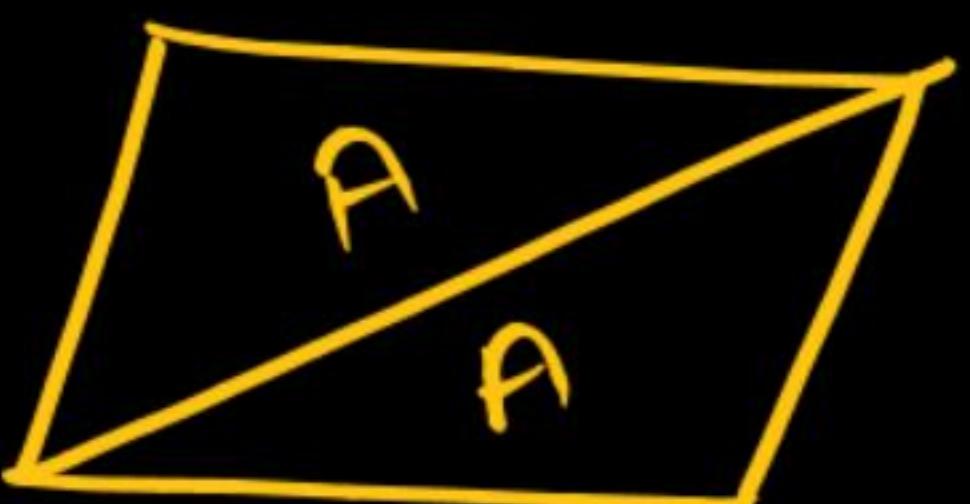


$$\text{Area of } \triangle APB = \frac{1}{2} \text{Area of } ABCD$$

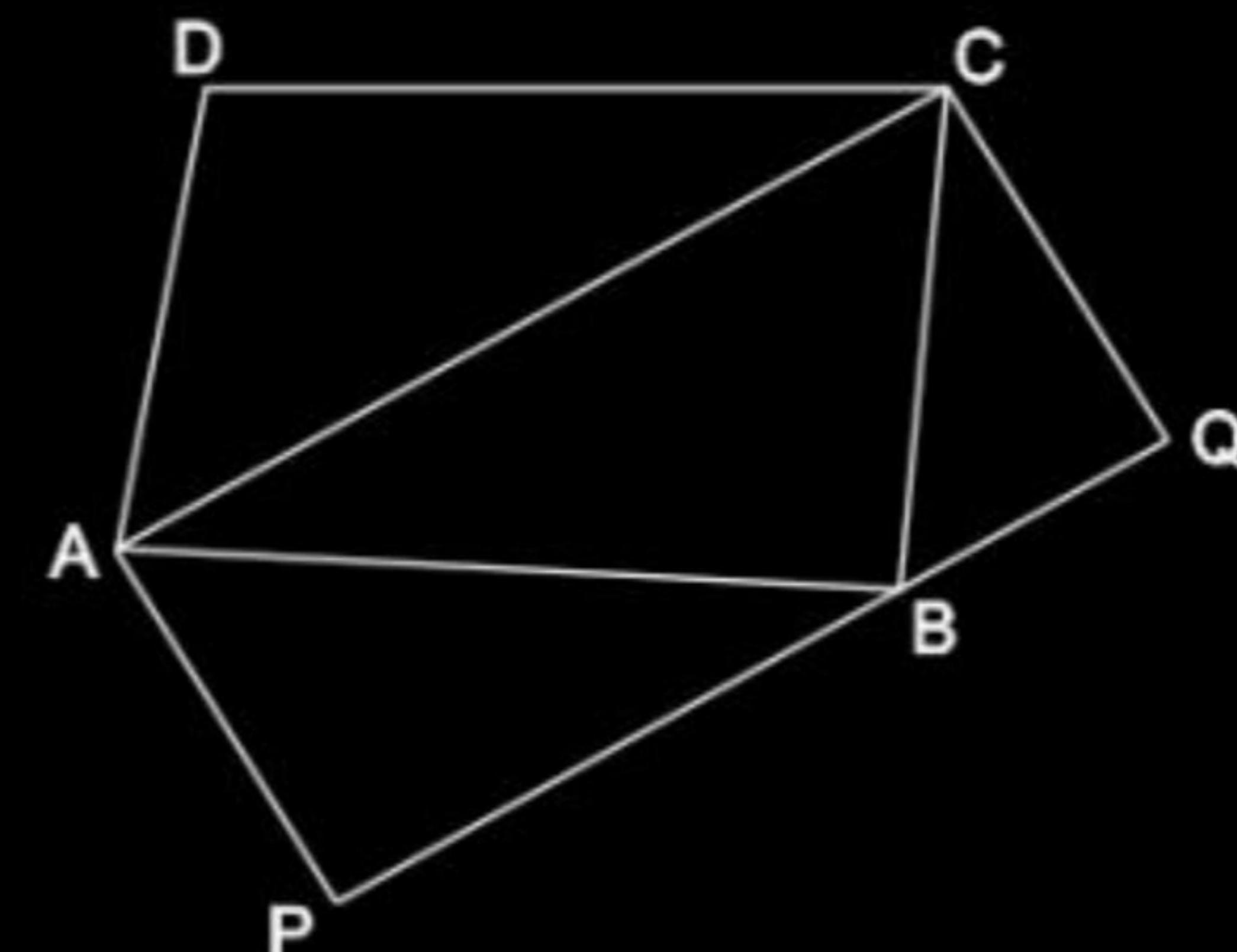
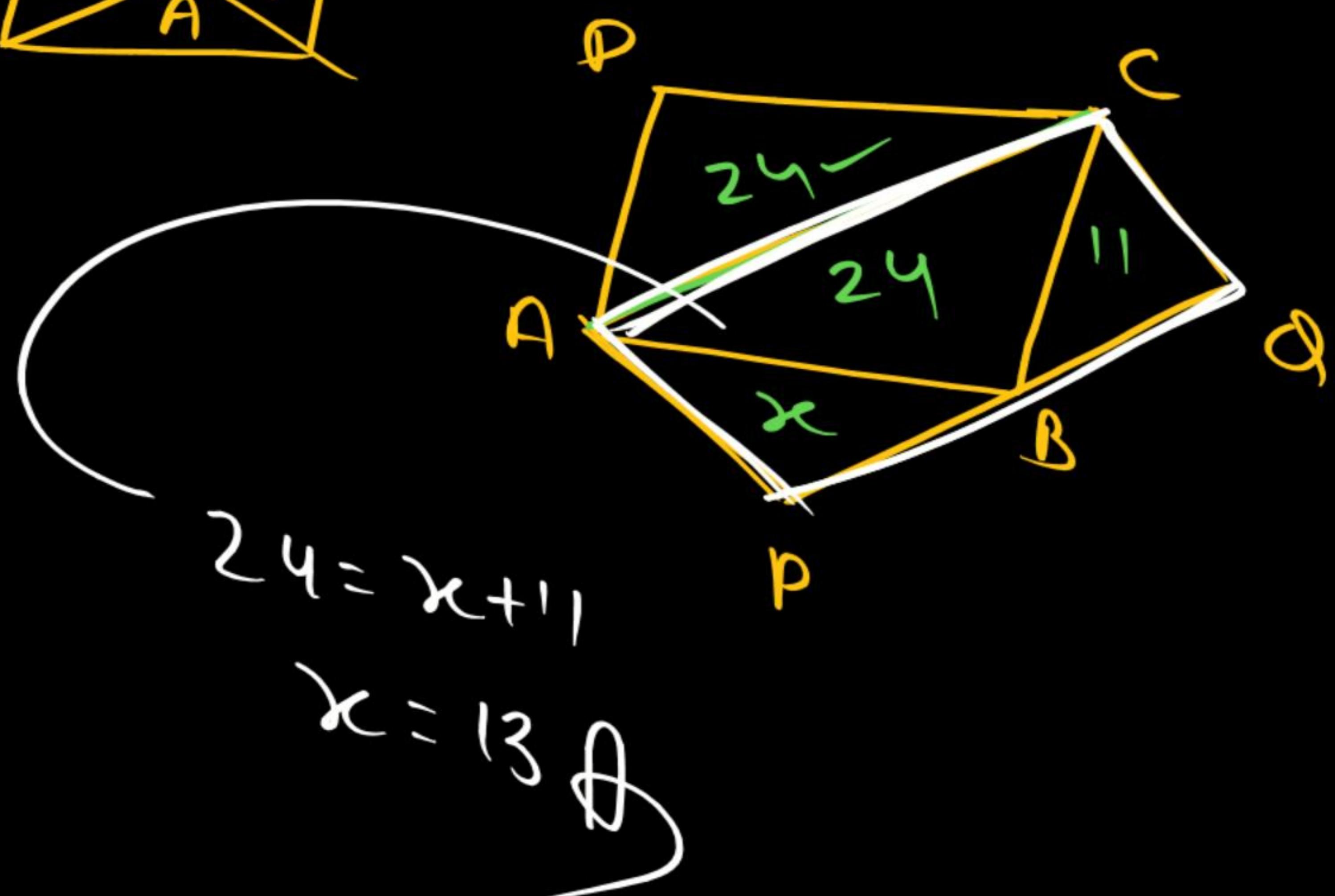


$$a = b + c$$

- ~~Ques~~ 35. ABCD is parallelogram and APQC is a parallelogram.  
 $\text{ar}(\Delta ADC) = 24 \text{ cm}^2$ ,  $\text{ar}(\Delta BCQ) = 11 \text{ cm}^2$ , then find  
 $\text{ar}(\Delta APB)$ .

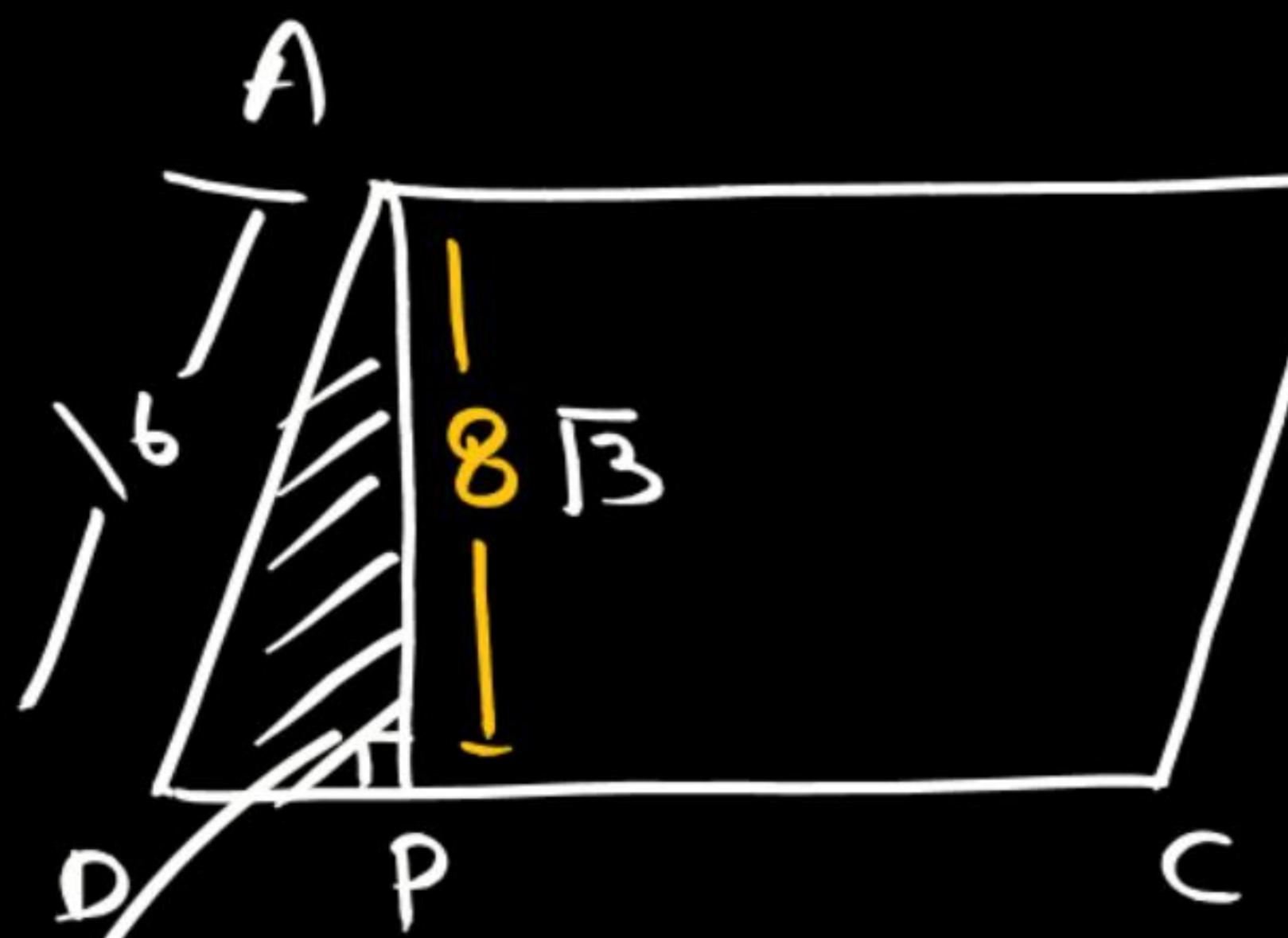


ABCD समांतर चतुर्भुज है और APQC एक समांतर चतुर्भुज है।  $\text{ar}(\Delta ADC) = 24 \text{ cm}^2$ ,  $\text{ar}(\Delta BCQ) = 11 \text{ cm}^2$  तो  $\text{ar}(\Delta APB)$  ज्ञात कीजिए।

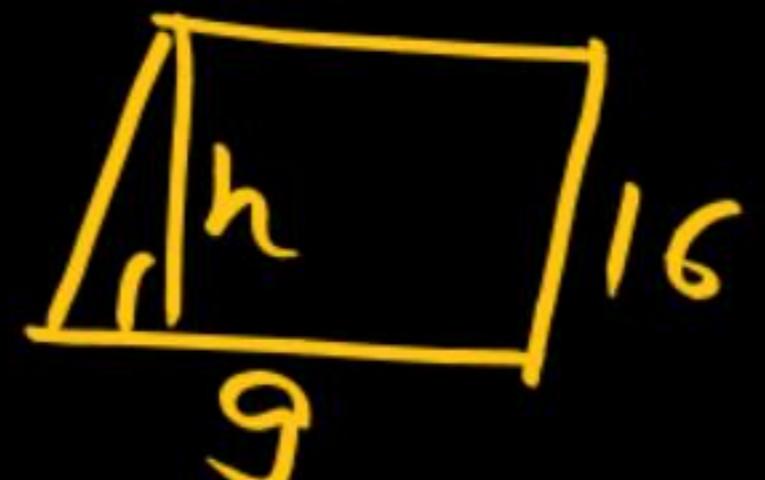
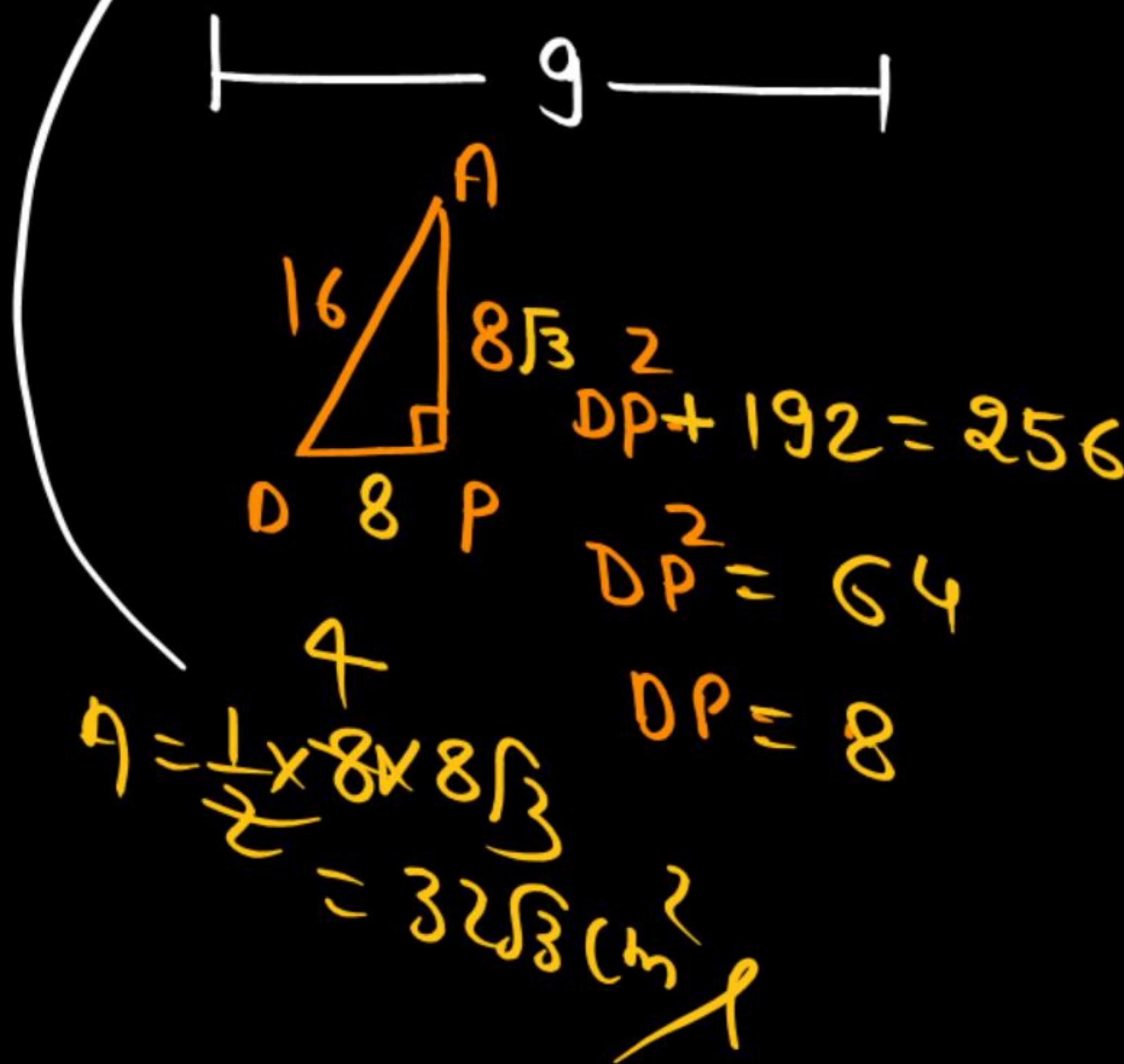


36.

ABCD is a parallelogram. If  $\text{ar}(\text{ABCD})$  is  $72\sqrt{3}$  cm<sup>2</sup>. CD and AD are 9 cm and 16 cm respectively if P lies on CD such that  $AP \perp CD$  then find the area of  $\Delta APD$ .



ABCD एक समांतर चतुर्भुज है। यदि  $\text{ar}(\text{ABCD})$ ,  $72\sqrt{3}$  सेमी<sup>2</sup> है। CD और AD क्रमशः 9 सेमी और 16 सेमी हैं यदि P CD पर इस प्रकार स्थित है कि  $AP \perp CD$  तो  $\Delta APD$  का क्षेत्रफल ज्ञात करें।



$$A = \text{Base} \times \text{ht}$$

$$\sqrt{3} \times 16 = 8 \times ht$$

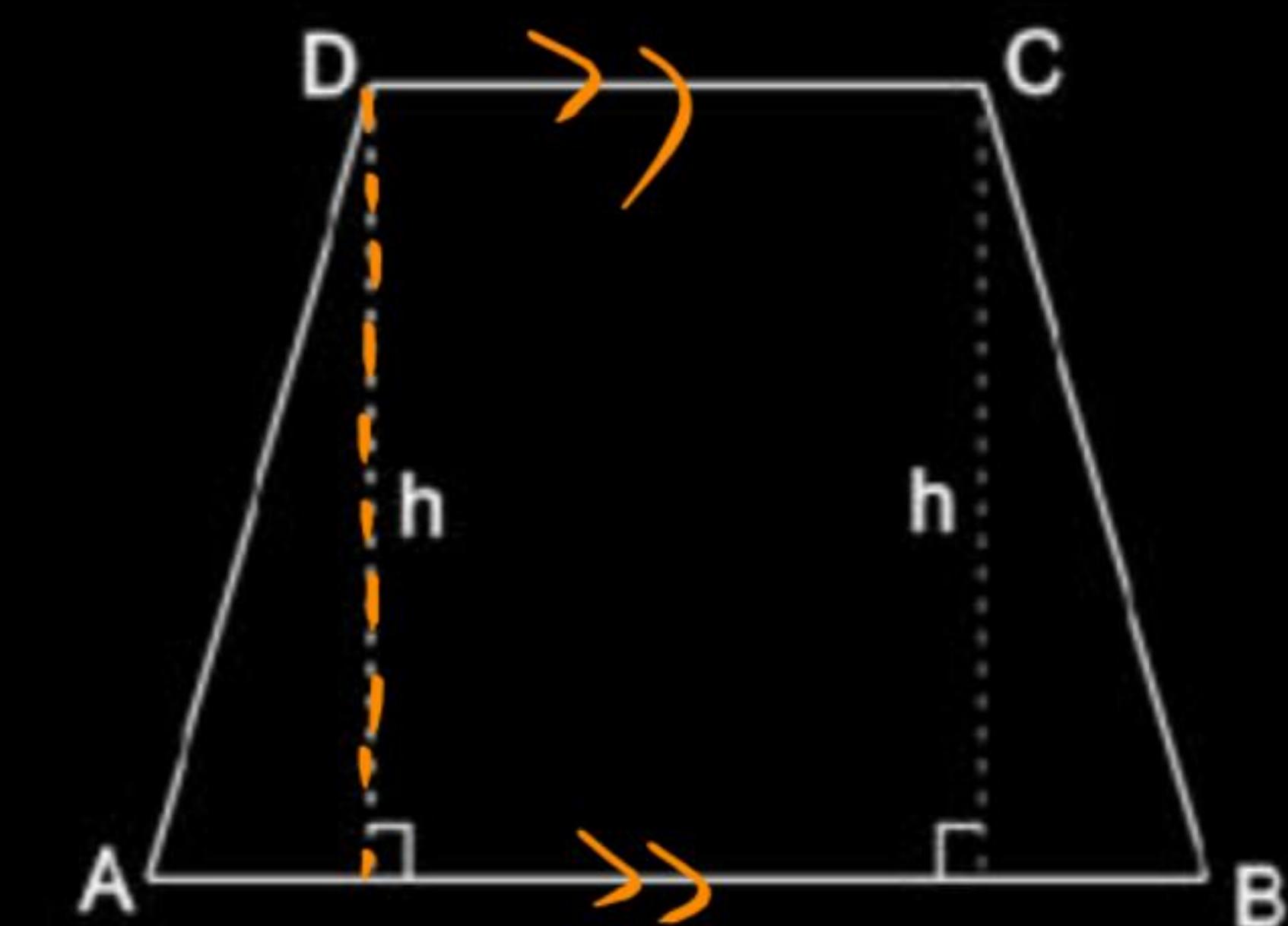
$$\sqrt{3} \times 8 = ht$$

Rishabh

### Trapezium:

\* A quadrilateral whose any two opposite sides are parallel is said to be a trapezium.

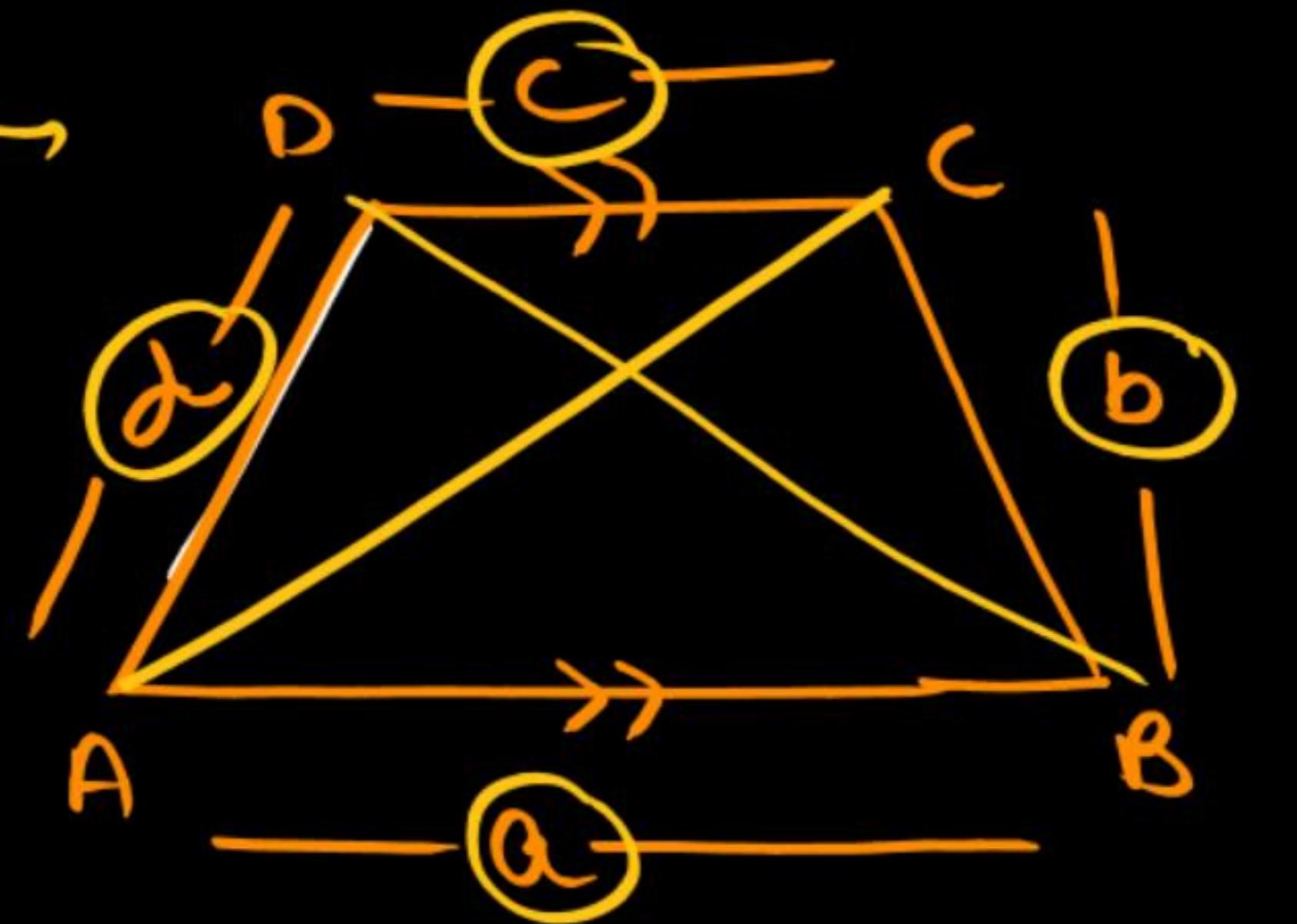
एक चतुर्भुज जिसकी कोई भी दो विपरीत भुजाएँ समान्तर हों, समलम्ब चतुर्भुज कहलाता है।



$$\text{Area} = \frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$$

$$= \frac{1}{2} (AB + CD) \times h$$

To prove →

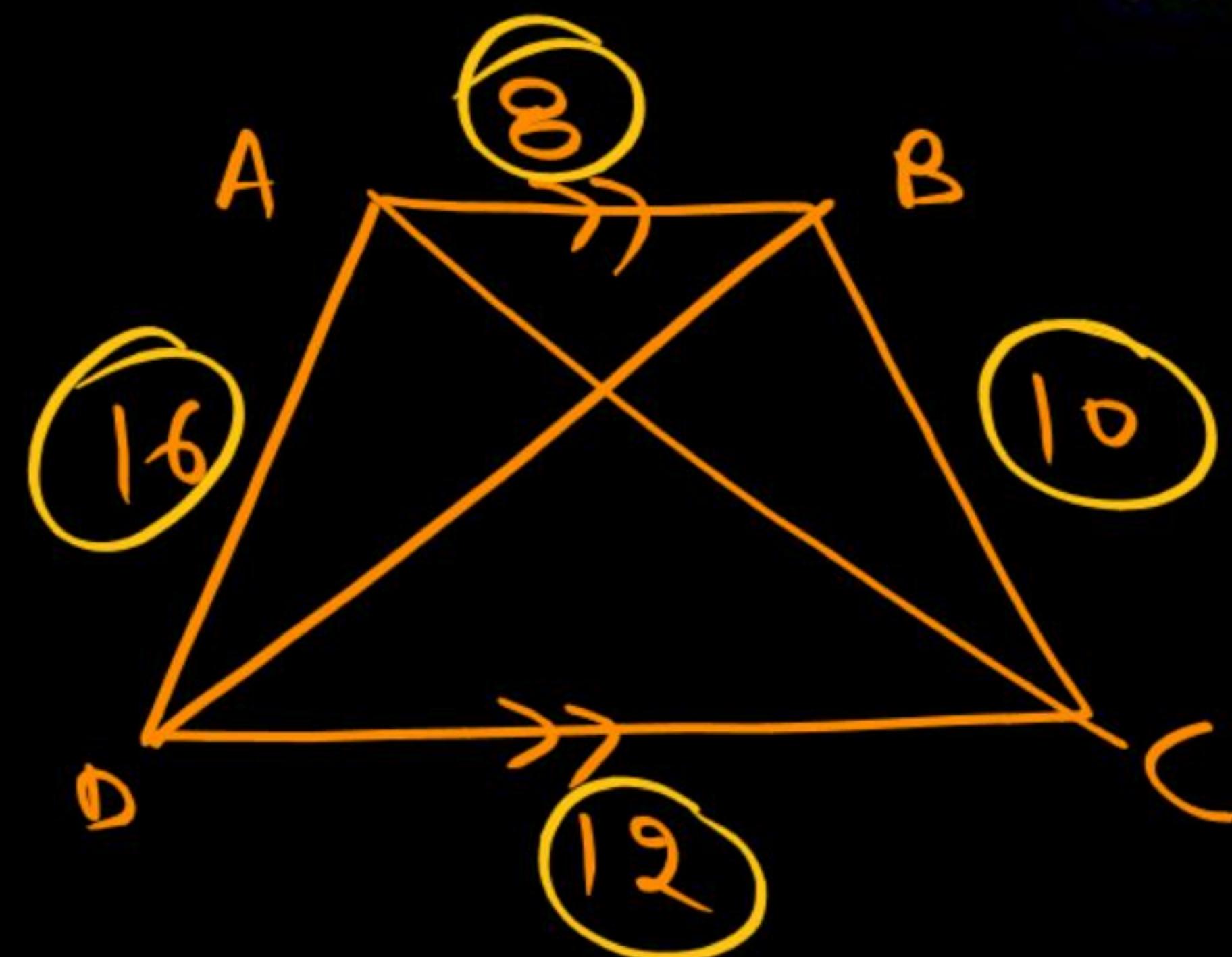


$$AC^2 + BD^2 = b^2 + d^2 + 2ac$$

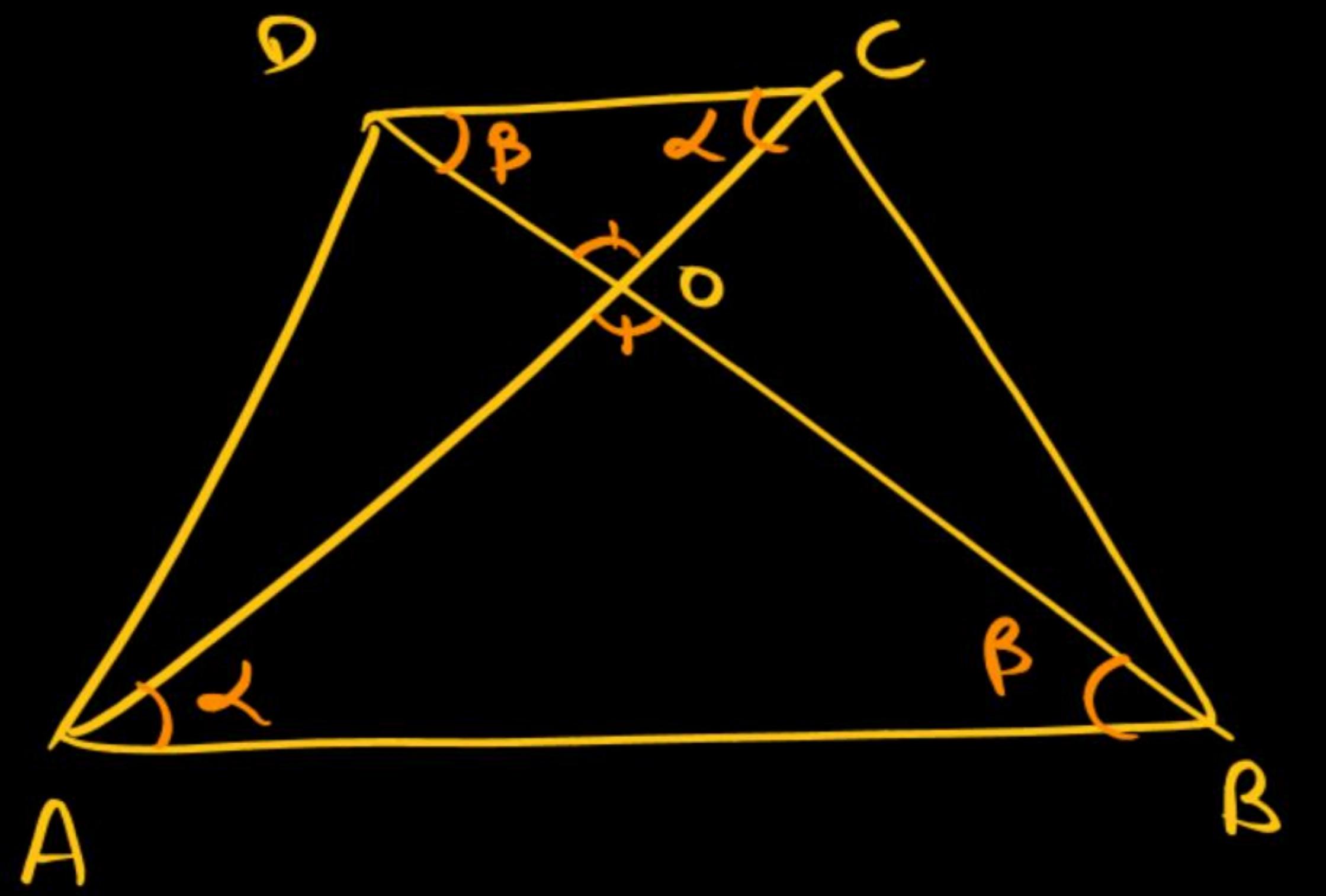
37.

If ABCD is a trapezium in which  $AB \parallel CD$ , If  $AB = 8$ ,  $BC = 10$ ,  $CD = 12$ ,  $DA = 16$ . Then find  $AC^2 + BD^2$ .

यदि ABCD एक समलंब है, जिसमें  $AB \parallel CD$  यदि  $AB = 8$ ,  $BC = 10$ ,  $CD = 12$ ,  $DA = 16$  है। तो  $AC^2 + BD^2$  ज्ञात कीजिए।

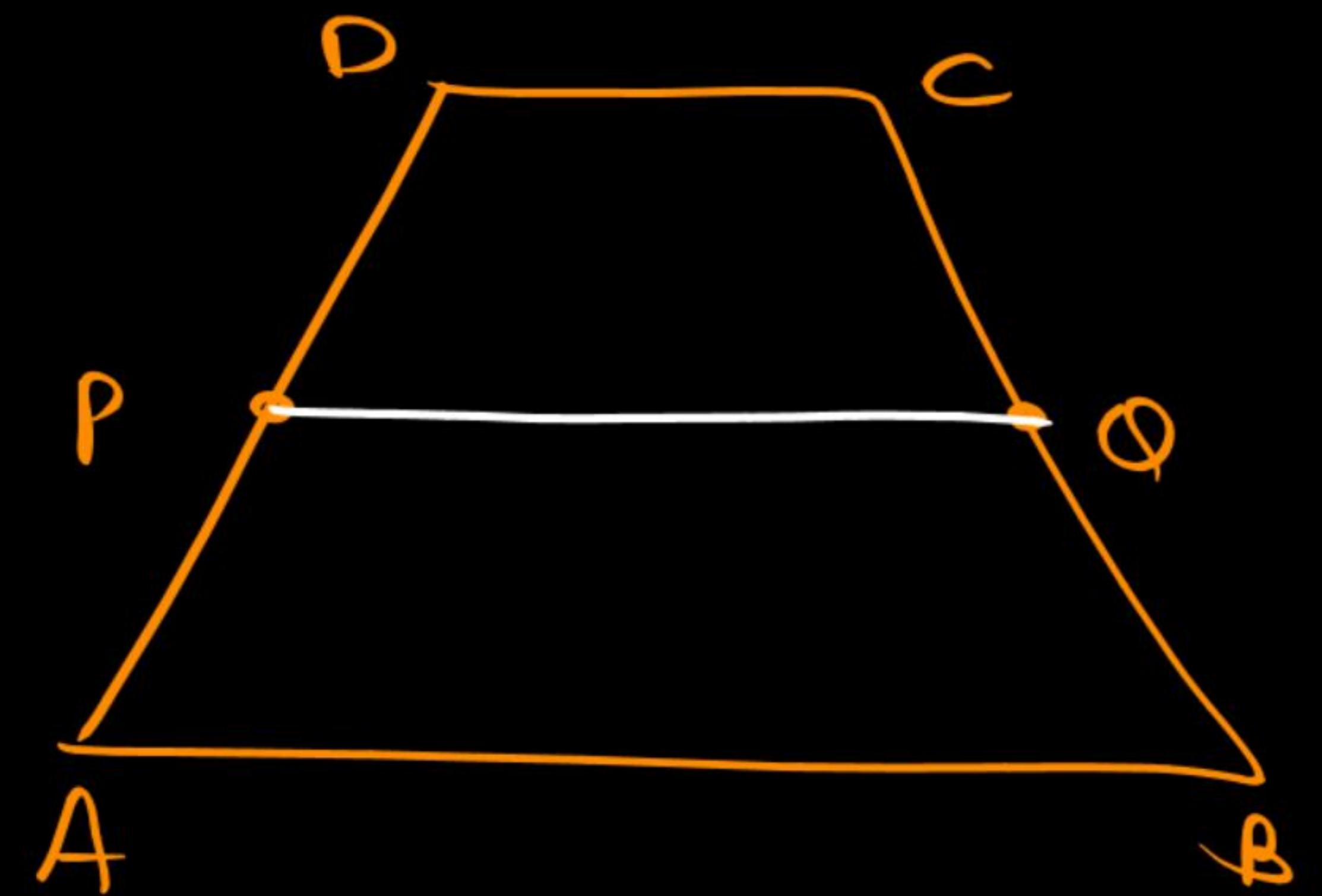


$$\begin{aligned}
 AC^2 + BD^2 &= 10^2 + 12^2 + 2 \times 12 \times 8 \\
 &= 256 + 100 + 192 \\
 &= 356 + 192 \\
 &\equiv 548
 \end{aligned}$$



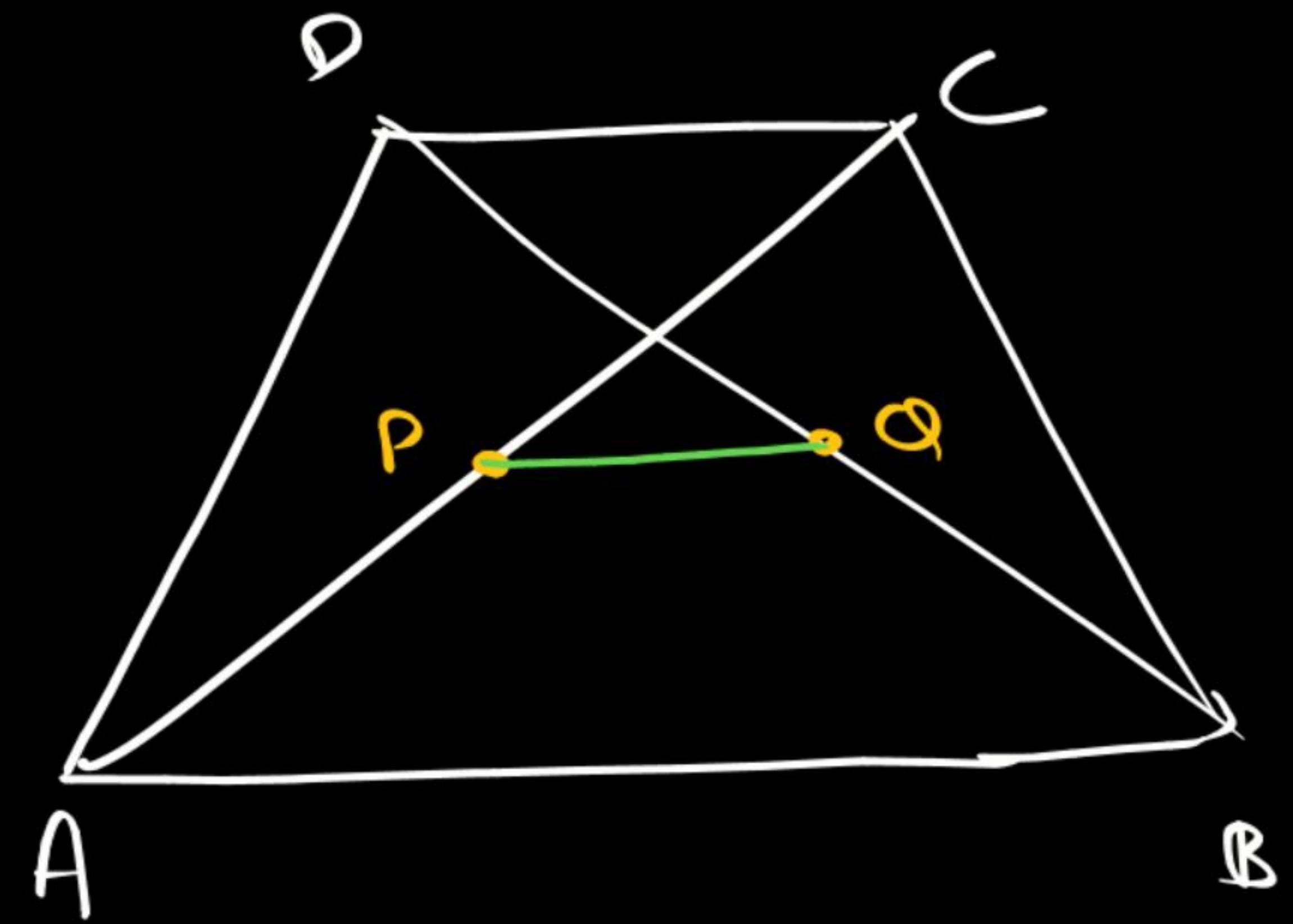
$$\triangle AOB \sim \triangle DOC$$

$AB \parallel CD$



P, Q are mid points of  
AD & BC

$$PQ = \frac{AB + CD}{2}$$



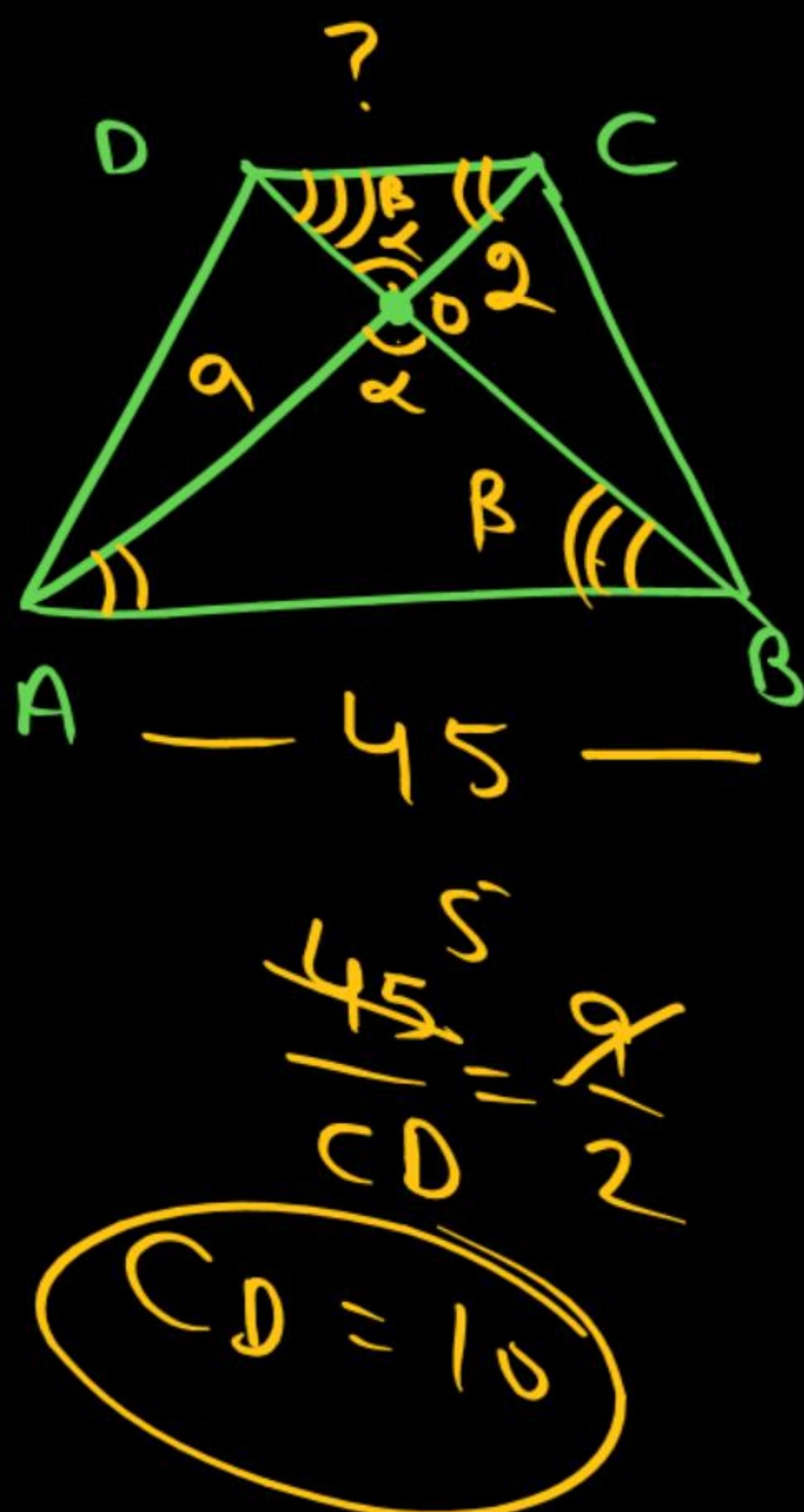
AC & BD are diagonal

P & Q are mid point of  
diagonals

$$PQ = \frac{AB - CD}{2}$$

38. If  $ABCD$  is a trapezium whose one diagonal divides each other in  $2 : 9$ . Find the value of  $CD$ , if  $AB = 45$ .

यदि  $ABCD$  एक समलंब है जिसका एक विकर्ण प्रत्यक्त दूसरे को  $2 : 9$  में विभाजित करता है, तो  $CD$  का मान ज्ञात कीजिए, यदि  $AB = 45$  है।

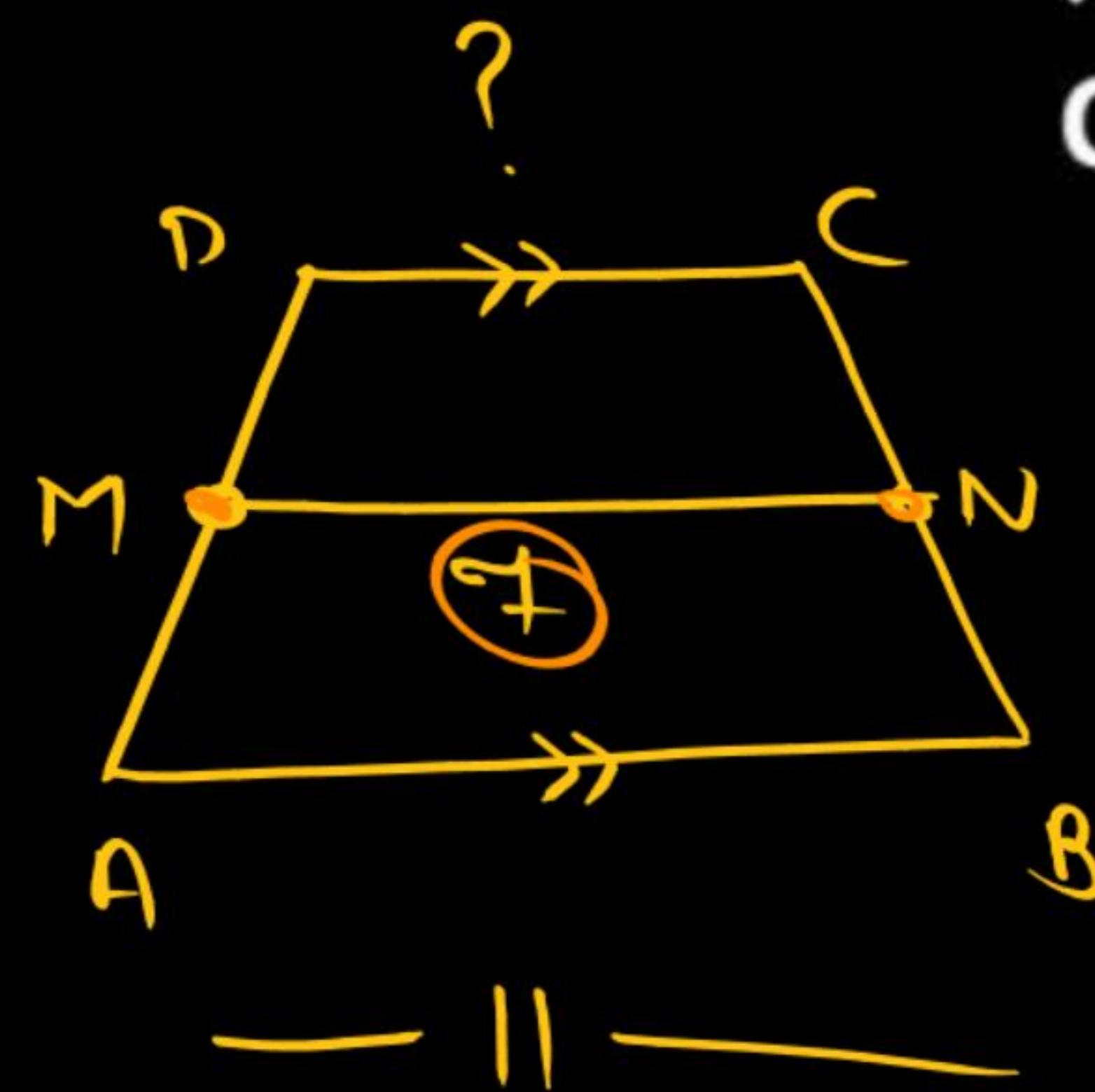


$$\frac{45}{CD} = \frac{9}{2}$$

$$CD = 10$$

39. If ABCD is a trapezium where  $AB \parallel CD$ , M and N are midpoints of AD and BC respectively.  $AB = 11$ ,  $MN = 7$   
Then find CD.

यदि ABCD एक समलंब है जहाँ  $AB \parallel CD$ , M और N क्रमशः AD और BC के मध्य बिंदु हैं।  $AB = 11$ ,  $MN = 7$  तो CD ज्ञात कीजिए।



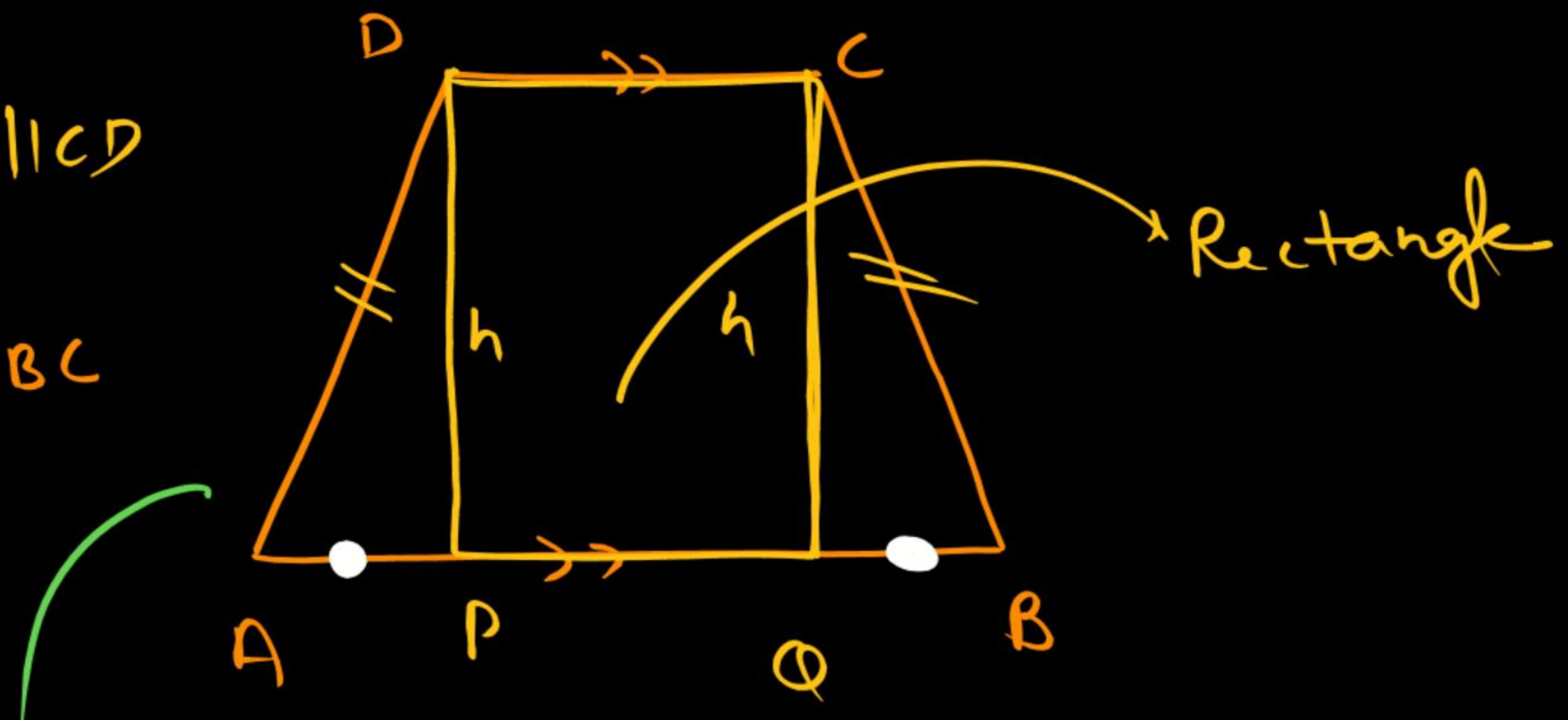
$$MN = \frac{AB + CD}{2}$$

$$7 = \frac{11 + CD}{2}$$

$$14 = 11 + CD$$

$$CD = 3$$

$AB \parallel CD$   
&  
 $AD = BC$

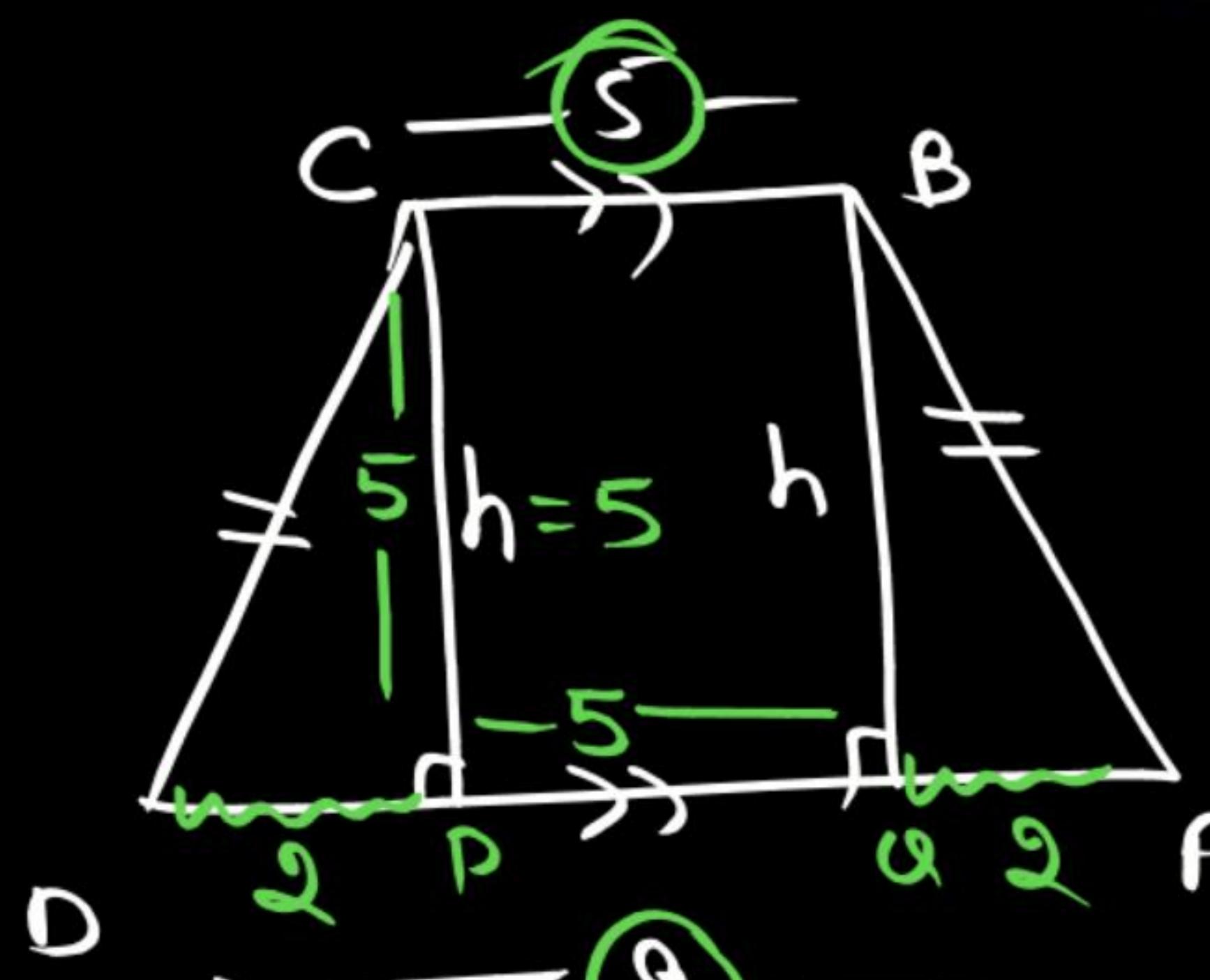


Isosceles trap  
 $|AP = QB|$

40.

**ABCD** is a trapezium in which  $AB = CD$  and  $AD \parallel BC$ . If area of trapezium is  $35 \text{ cm}^2$ . then find. Where  $AD$  and  $BC$ ,  $9 \text{ cm}$  and  $5 \text{ cm}$  respectively.  $CD$

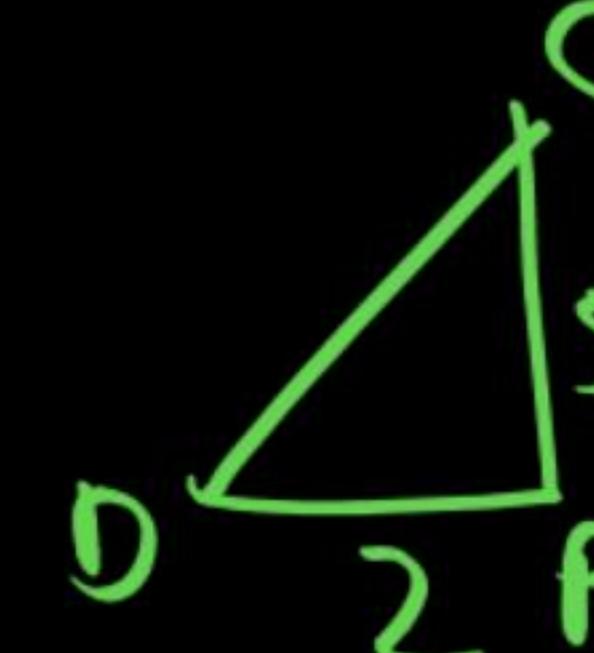
**ABCD** एक समलंब है जिसमें  $AB = CD$  और  $AD \parallel BC$ । यदि समलंब का क्षेत्रफल  $35 \text{ सेमी}^2$  है। तो  $CD$  ज्ञात कीजिए। जहाँ  $AD$  और  $BC$  क्रमशः  $9 \text{ सेमी.}$  और  $5 \text{ सेमी.}$  हैं।



$$A = \frac{1}{2}(\text{sum of parallel sides}) \times h$$

$$35 = \frac{1}{2}(9 + 5) \times h$$

$$h = 5$$

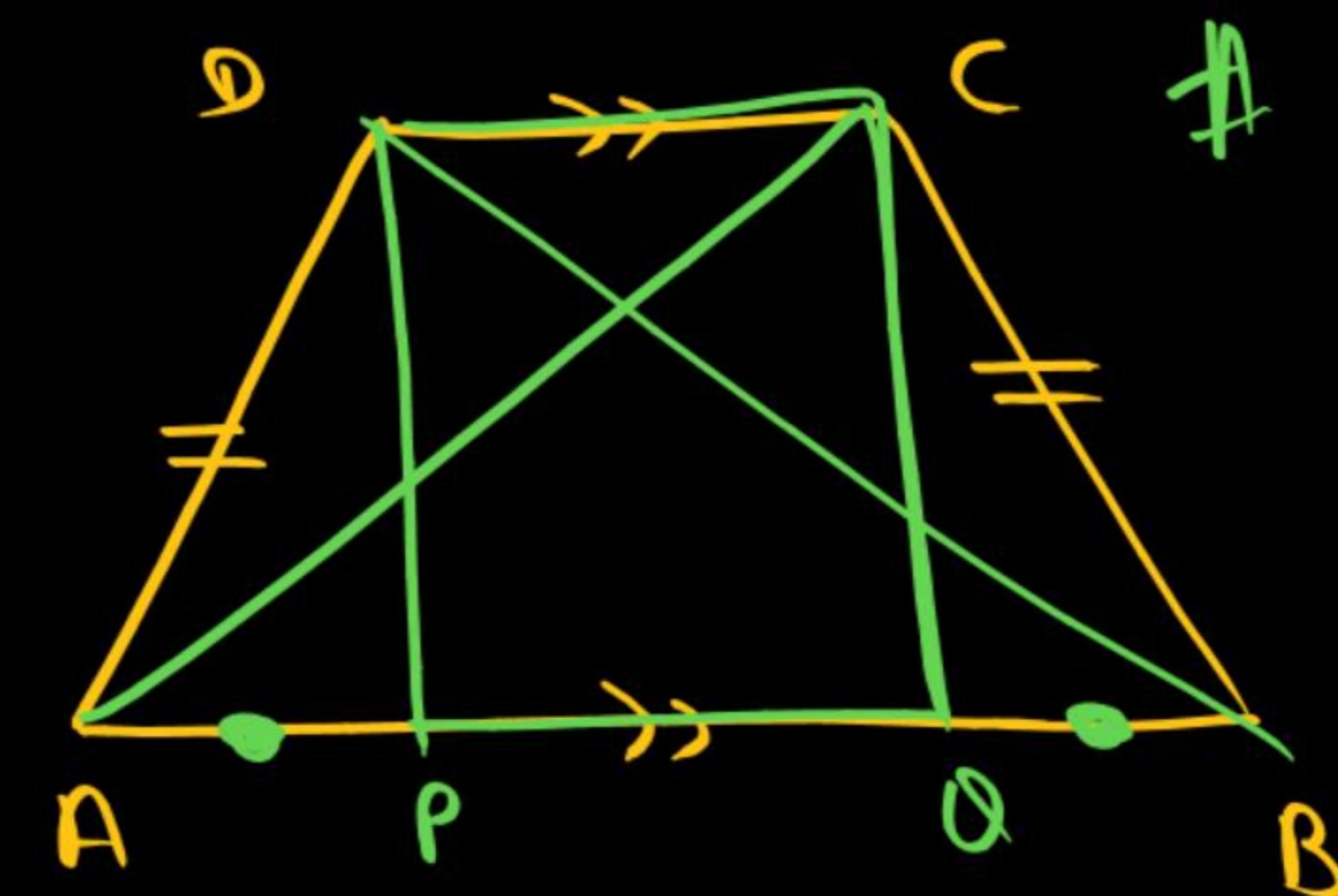


$$DC^2 = 25 + 4$$

$$DC = \sqrt{29}$$

When non  $\parallel$  sides are equal then trap. is said to be

Isoscales trap

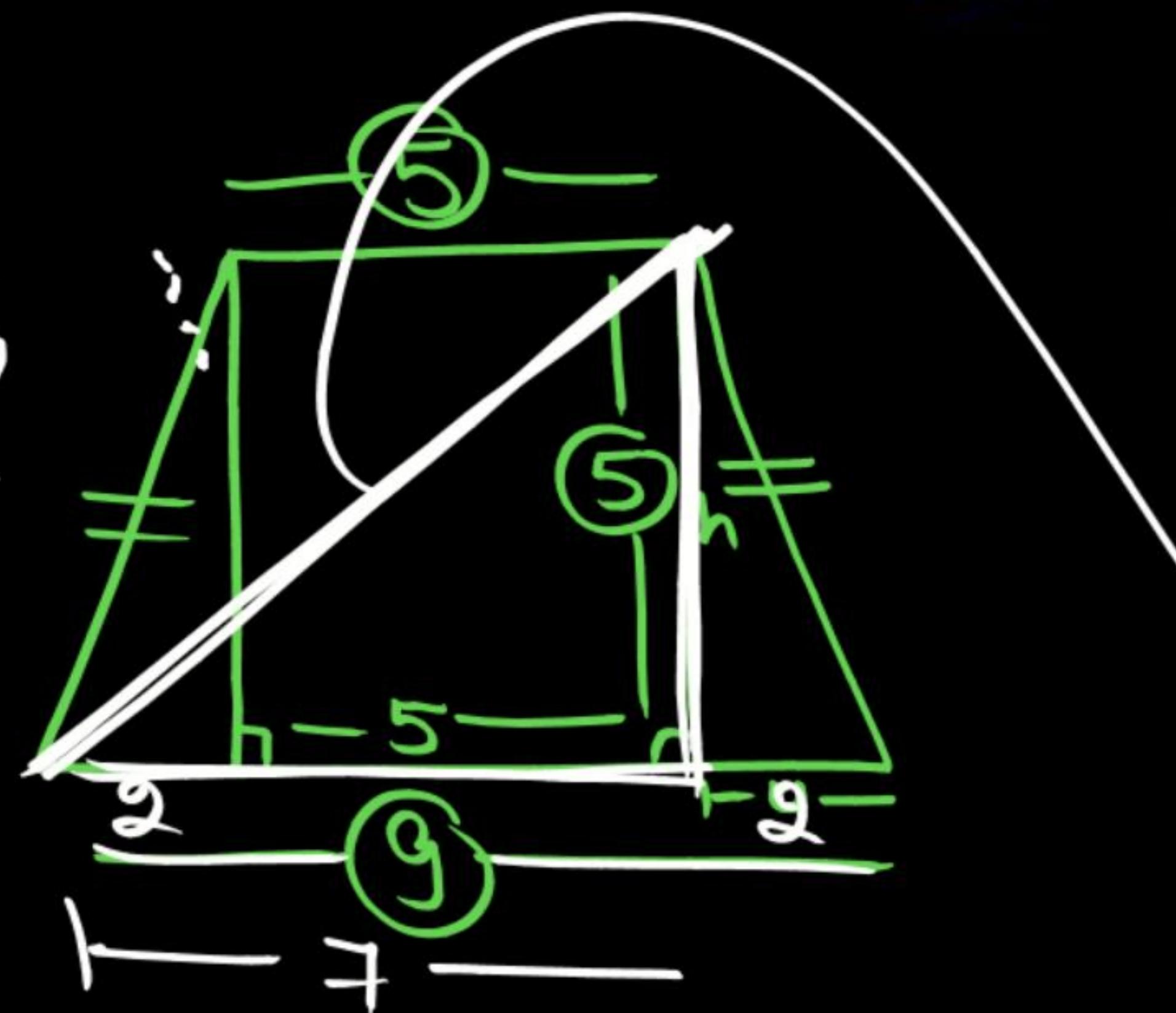


# Both diagonal will be same

41.

**Area of trapezium is  $35 \text{ cm}^2$ . Parallel sides are 9 and 5 cm, and remaining sides are, equal. Find the length of diagonals.**

समलंब का क्षेत्रफल  $35$  सेमी $^2$  है। समानांतर भुजाएँ  $9$  और  $5$  सेमी हैं, और शेष भुजाएँ समान हैं। विकणों की लंबाई ज्ञात कीजिए।



$$d^2 = 7^2 + s^2$$

$$A = \frac{1}{2} \times (\text{sum of parallel sides}) \times h$$

~~$$35 = \frac{1}{2} \times (9 + 5) \times h$$~~

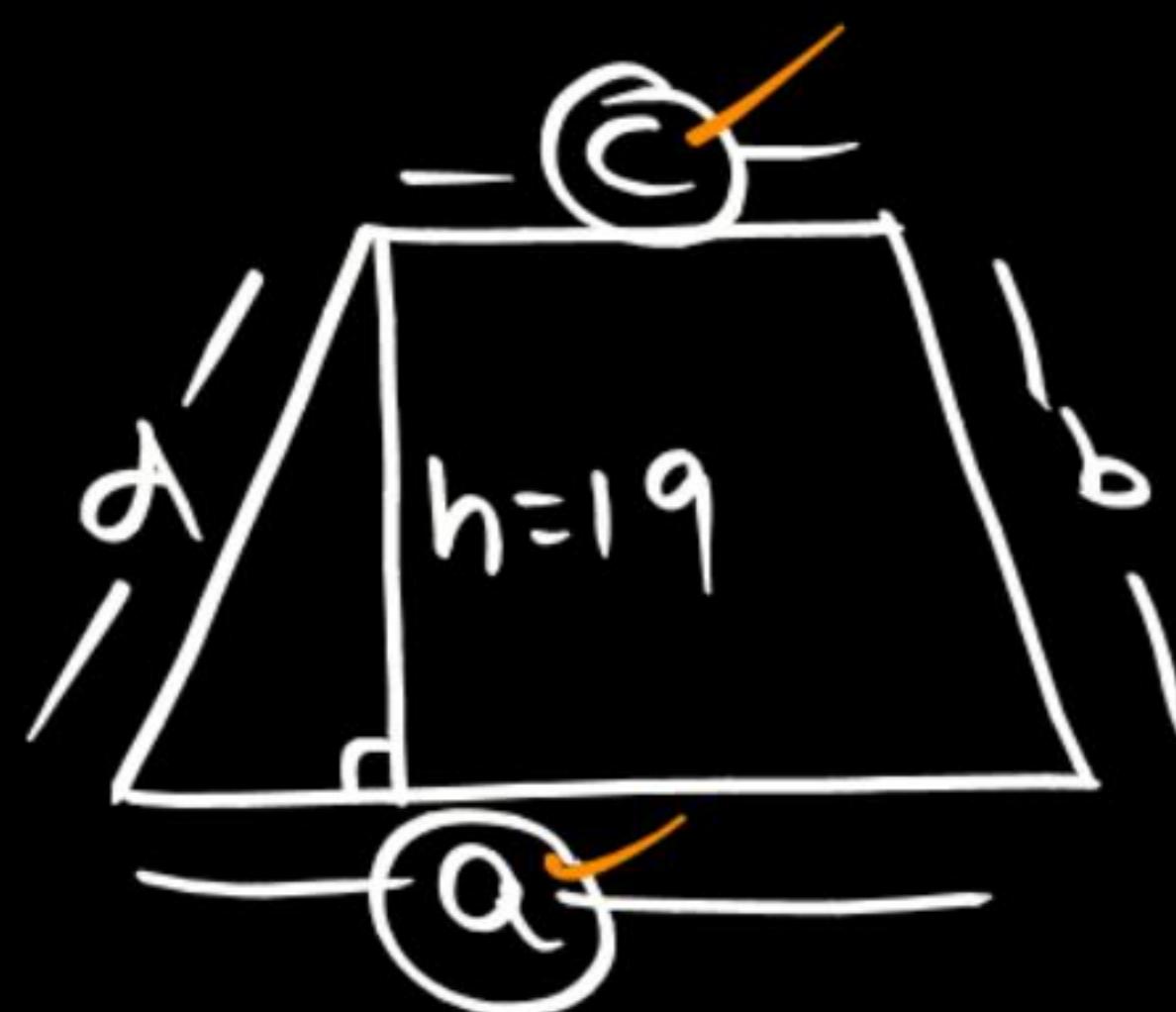
$$h = 5$$

$$d^2 = 49 + 25$$

$$d = \sqrt{74}$$

42. Area of a trapezium is  $475 \text{ cm}^2$ . If  $h = 19 \text{ cm}$  difference between length of parallel sides is of  $4 \text{ cm}$ . Then find the length of the parallel sides.

एक समलंब का क्षेत्रफल  $475 \text{ सेमी}^2$  है। यदि  $h = 19 \text{ सेमी}$  और समानांतर भुजाओं की लंबाई के बीच का अंतर  $4 \text{ सेमी}$  है। तो समानांतर भुजाओं की लंबाई ज्ञात कीजिए।



$$a-c=4$$

$$a+c=50$$

$$a-c=4$$

$$\underline{a=27}$$

$$c=23$$

$$A = \frac{1}{2}(a+c) \times h$$

$$\frac{25}{475} = \frac{1}{2}(a+c) \times 19$$

$$a+c=50$$

Revise

कल रात (8 to 10) pm

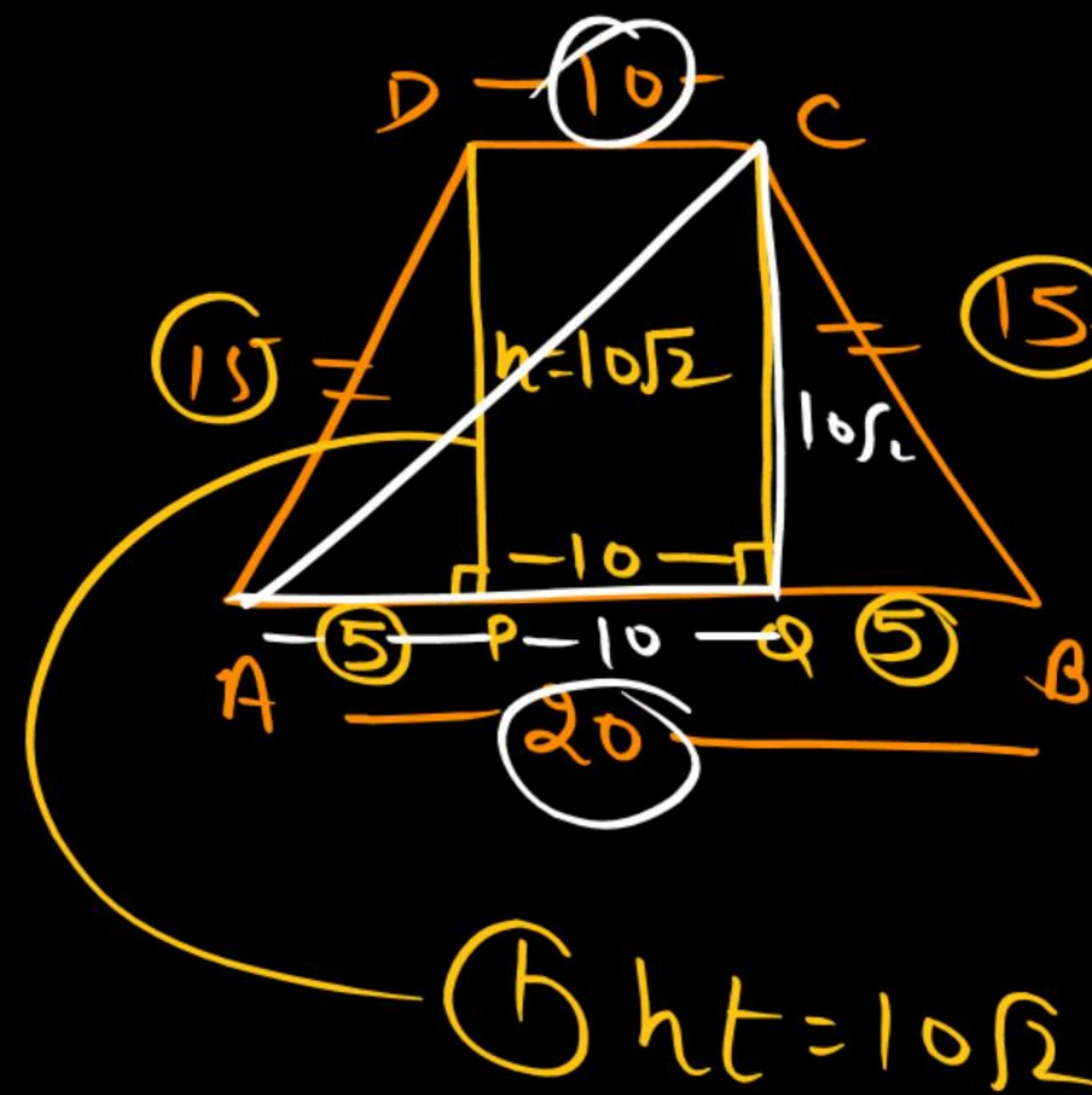
Geo + M

Y-T.

43.

ABCD is a trapezium whose parallel side are 20 and 10 cm and non parallel sides are 15 cm each, Find Height diagonals and area ?

ABCD एक समलम्ब चतुर्भज है जिसकी समांतर भुजायं 20 और 10 सेमी. तथा बाकी दोनों भुजायं प्रत्यक्ष 15 सेमी. है। तो समलम्ब की ऊँचाई, विकर्ण और क्षेत्रफल ज्ञात कीजिए?



$$\begin{aligned}
 & \text{Diagram shows a trapezium with parallel bases } d \text{ and } 10\sqrt{2}, \text{ and non-parallel sides both } 15. \\
 & \text{Area } A = \frac{1}{2} (d + 10\sqrt{2}) \times 15 \\
 & = 150\sqrt{2} \text{ cm}^2 \\
 & d^2 = 225 + 200 \\
 & d = \sqrt{425}
 \end{aligned}$$



44. ABCD is a trapezium whose parallel side are 16 and 10 cm and non parallel sides are 7 and 5 cm, Find Height , Diagonals and Area ?

ABCD एक समलम्ब चतुर्भुज है जिसकी समांतर भुजायं 16 और 10 सेमी. तथा बाकी दोनों भुजायं 7 तथा 5 सेमी. है। तो समलम्ब की ऊँचाई, विकर्ण और क्षेत्रफल ज्ञात कीजिए?

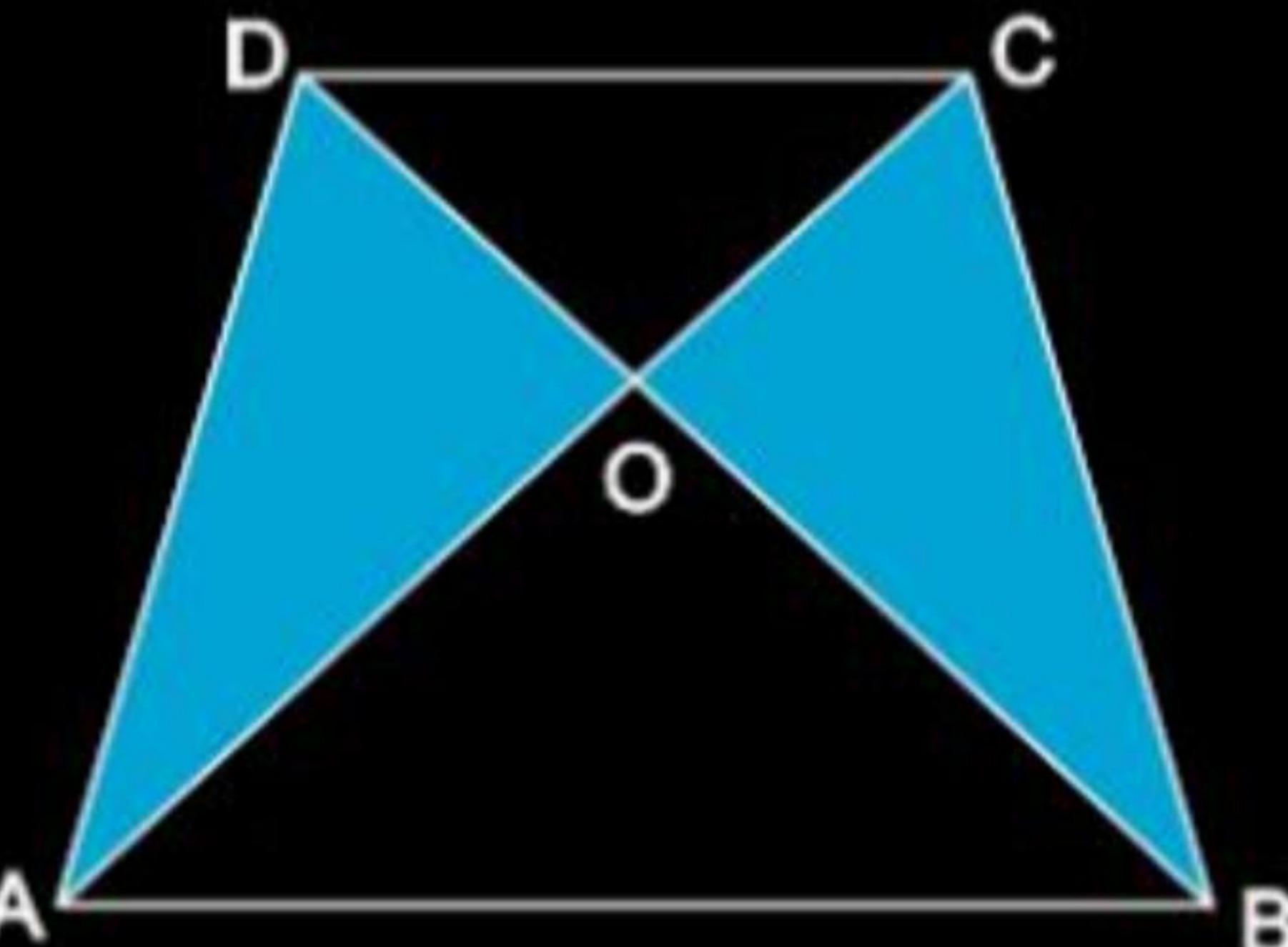
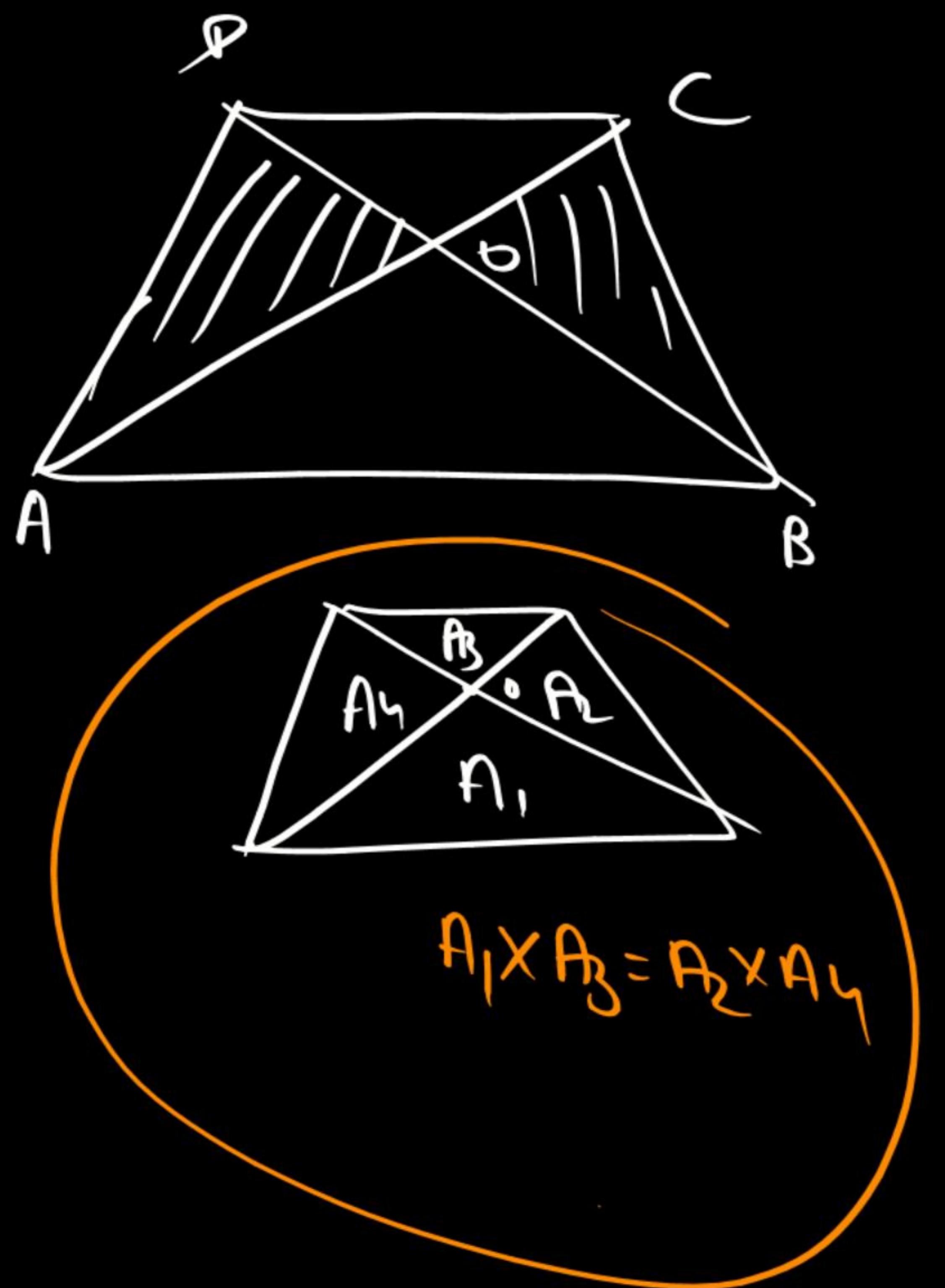
45. ABCD is a trapezium whose parallel side are 20 and 10 cm and non parallel sides are 8 and 6 cm, Find Height , Diagonals and Area ?

ABCD एक समलम्ब चतुर्भुज है जिसकी समांतर भुजायं 20 और 10 सेमी. तथा बाकी दोनों भुजायं 8 तथा 6 सेमी. है। तो समलम्ब की ऊँचाई, विकर्ण और क्षेत्रफल ज्ञात कीजिए?

\*

In a trapezium ABCD, given  $AB \parallel CD$ ,

area of  $\Delta DOA =$  area of  $\Delta COB$



$\text{ar} (\Delta DOA) = \text{ar} (\Delta COB)$



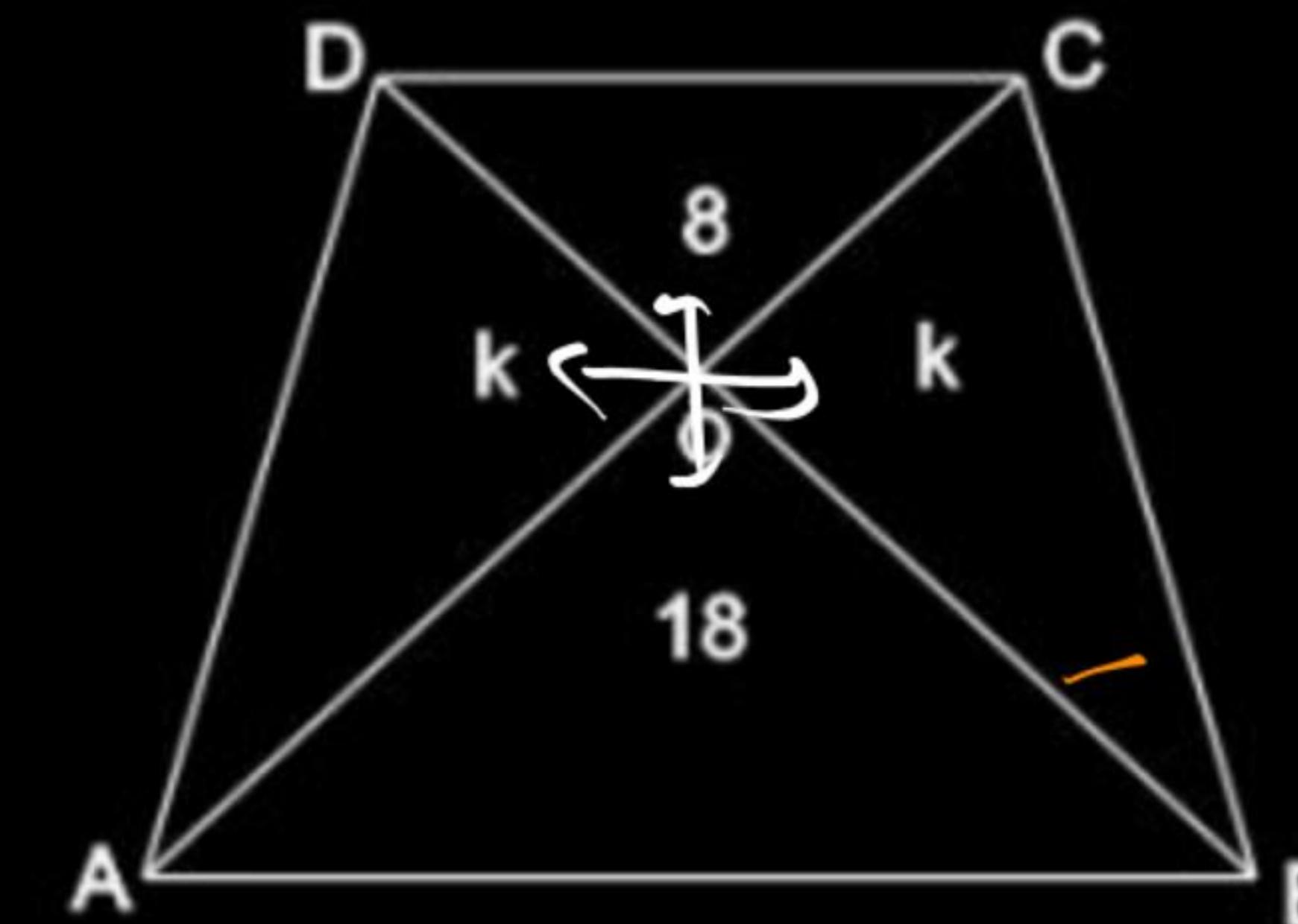
46. If ABCD is trapezium as shown in the figure. Find the value of K?

ABCD एक समलम्ब है। जैसा कि आकृति में दर्शाया गया है, तो K का मान ज्ञात कीजिए?

$$18 \times 8 = k \times k$$

$$144 = k^2$$

$$k = 12$$





47. ABCD is a trapezium. where  $AB \parallel CD$ ,  $AB = 4$ ,  $CD = 1$ ,  
Find ratio of area of  $\Delta DCB$  and area of  $\Delta AOB$ .

ABCD एक समलंब है। जहाँ  $AB \parallel CD$ ,  $AB = 4$ ,  $CD = 1$ ,  $\Delta DCB$  और  $\Delta AOB$  के क्षेत्रफलों का अनुपात ज्ञात कीजिए।

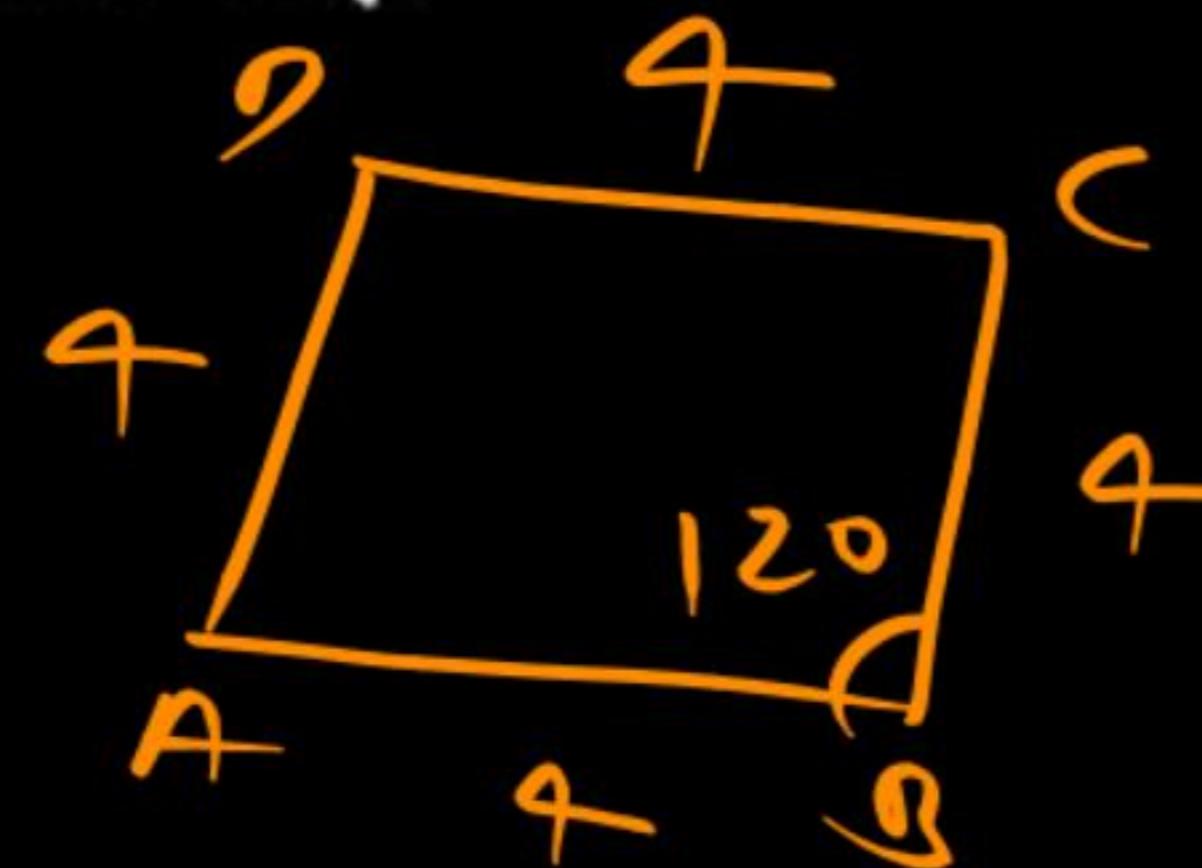


48. ABCD is trapezium, where  $AB \parallel CD \parallel PQ$ . And PQ divides the area in two parts. Find PQ if AB and CD are 13 and 9 cm.

ABCD समलम्ब है, जहाँ  $AB \parallel CD \parallel PQ$  तथा PQ इस क्षेत्र को दो भागों में विभाजित करता है। यदि AB और CD क्रमशः 13 और 9 सेमी हैं, तो PQ ज्ञात कीजिए।

49. ABCD is a rhombus, whose side AB = 4 cm,  $\angle ABC = 120^\circ$ . Then find the length of diagonal BD.

ABCD एक समचतुर्भुज है, जिसकी भुजा AB = 4 सेमी,  $\angle ABC = 120^\circ$  है। तो विकर्ण BD की लंबाई ज्ञात कीजिए।

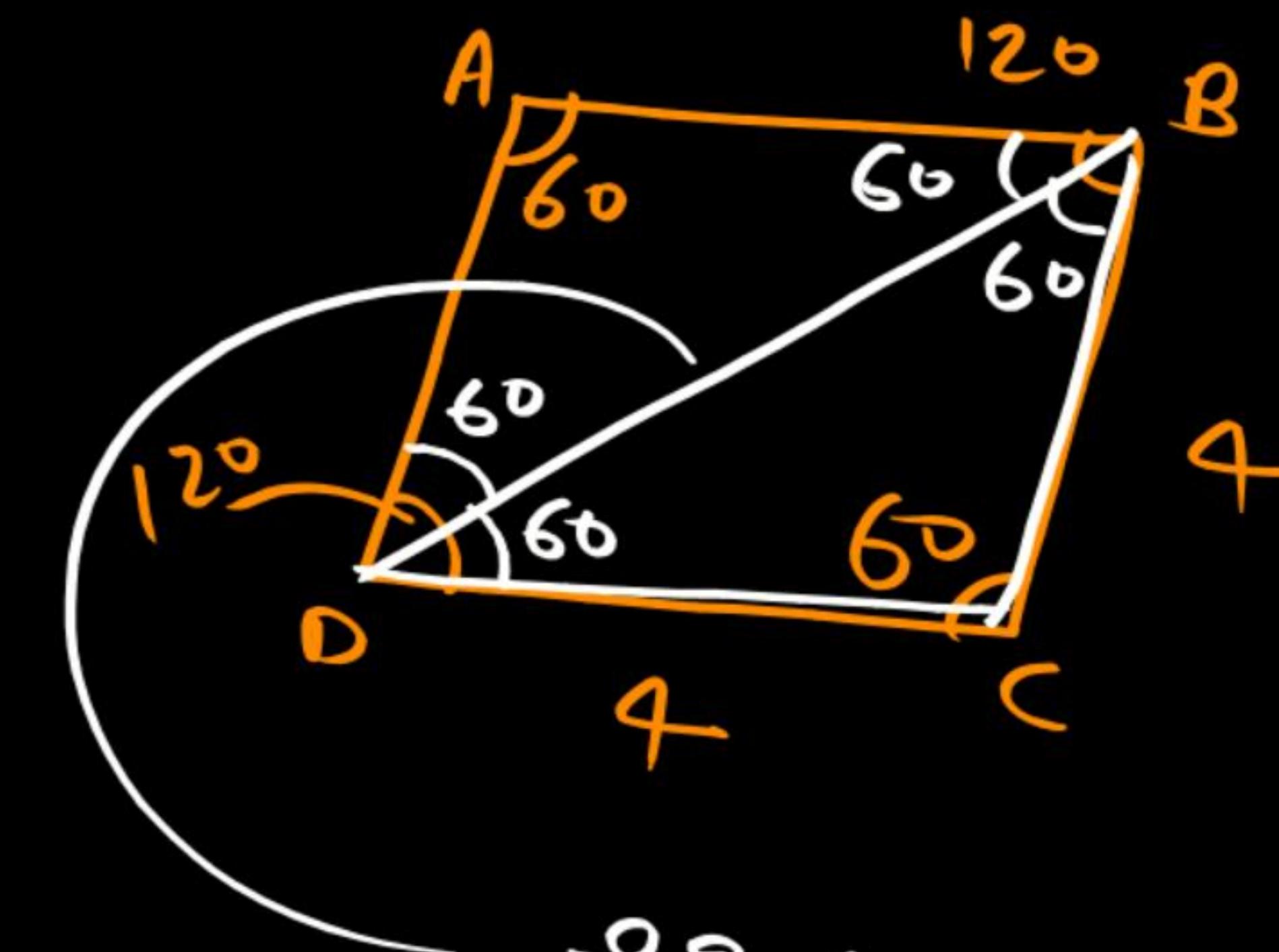


$$A = AB \times AC \times \sin \theta$$

$$4 \times 4 \times \sin 120^\circ$$

$$16 \times \frac{\sqrt{3}}{2}$$

$$16 \times \frac{\sqrt{3}}{2} = 8\sqrt{3}$$

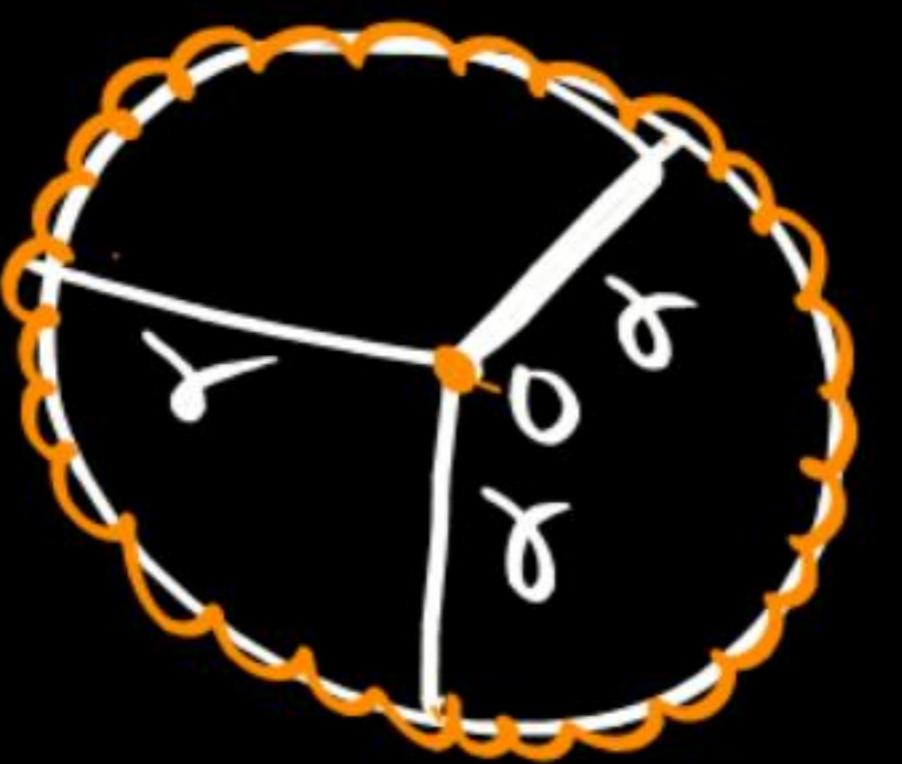


eq. 0

$$BD = 4 \text{ cm}$$

# CIRCLE

## Circle (वृत्त)

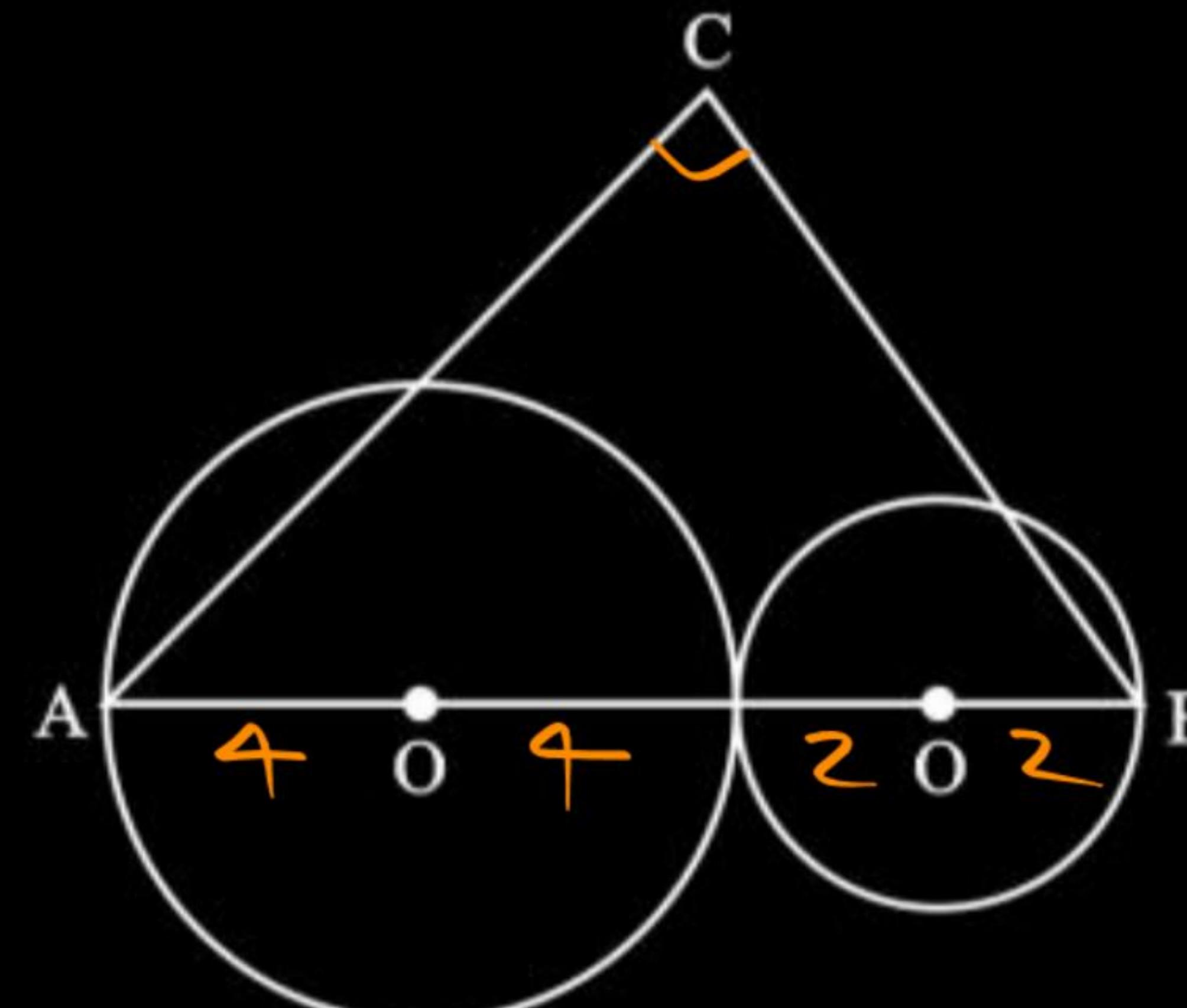
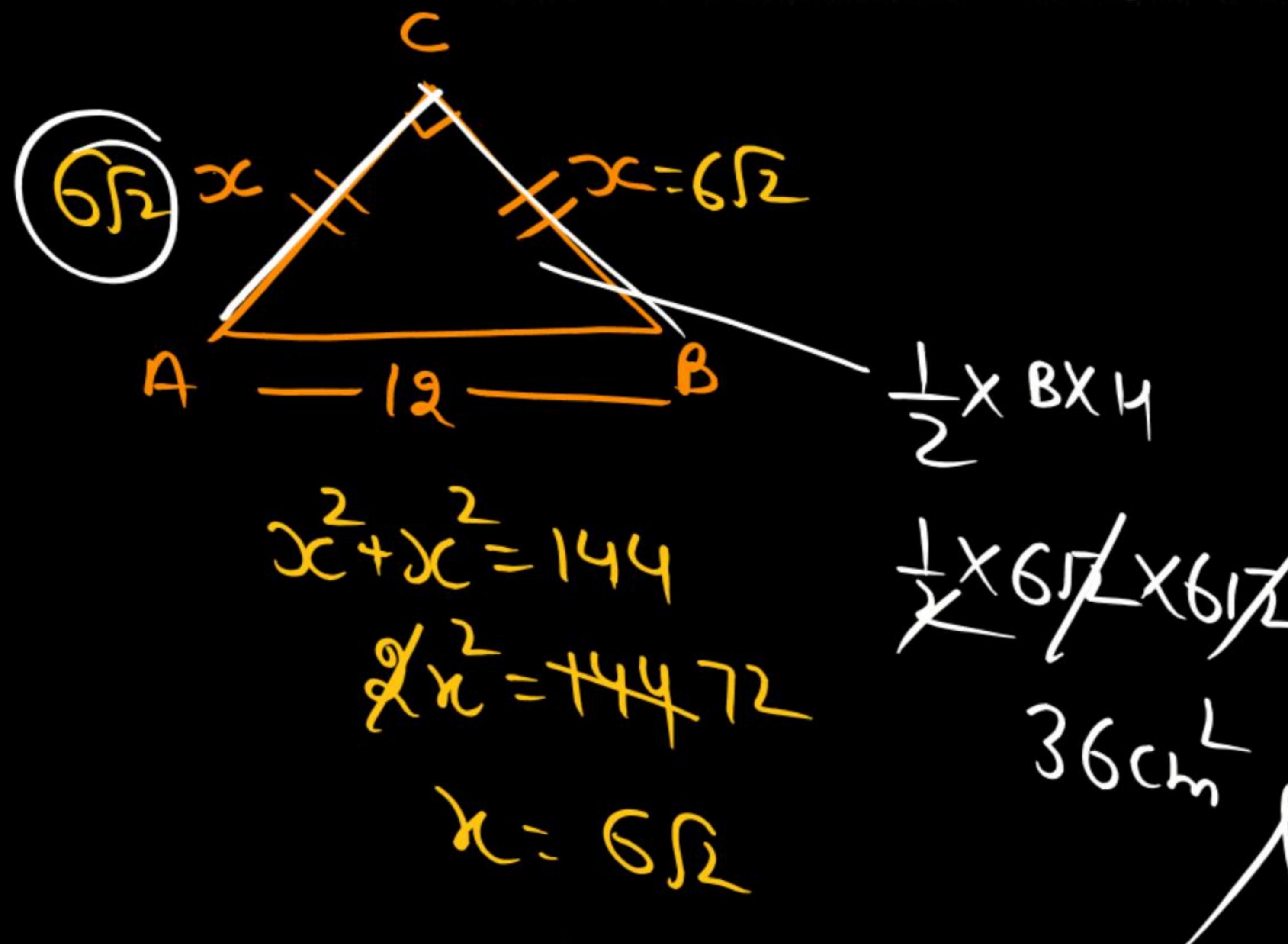


(भौतिकी)  $A = \pi r^2$

(परिमिति)  $C = 2\pi r$

1. Find the area of  $\triangle ABC$ , where  $AO = 4$ ,  $OB = 2$  and  $AC = BC$ ,  $\angle ACB = 90^\circ$ .

$\triangle ABC$  का क्षेत्रफल ज्ञात कीजिए, जहाँ  $AO = 4$ ,  $OB = 2$  और  $AC = BC$ ,  $\angle ACB = 90^\circ$ .



2. In  $\triangle ABC$ , if  $AB = 5$ ,  $BC = 6$ ,  $CA = 7$ . Find  $AP = ?$   
 $\triangle ABC$  में, यदि  $AB = 5$ ,  $BC = 6$ ,  $CA = 7$ .  $AP$  ज्ञात करें?

$$\begin{aligned}
 a+c &= 5 \\
 b+c &= 6 \\
 b+a &= 7 \\
 \hline
 2(a+b+c) &= 18 \\
 @a+b+c &= 9 \\
 a+6 &= 9 \\
 a &= 3 = AP
 \end{aligned}$$

