

13. Measure of each interior angle of a regular polygon can never be:

किसी सम बहुभुज का आंतरिक कोण निम्न में कौनसा नहीं हो सकता:

- ~~a) 150~~
- c) 108

- b) 105
- d) 144

$$\begin{array}{r} 12 \text{ sides} \\ 360 \\ \hline 30 \end{array}$$

$$\begin{array}{r} 24 \\ 360 \\ \hline 75 \\ 5 \end{array}$$

4.8 sides

not possible

coaching center

14. In a polygon, five interior angles are 172° each and all remaining interior angles are 160° each. Find the no. of diagonal.

किसी बहुभुज में, आंतरिक पांच कोण 172° हैं और बाकी सभी आंतरिक कोण 160° हैं। बहुभुज के विकरणों की संख्या बताओ।

- a) 152
~~c) 189~~

- b) 170
 d) 209

$n = 21$

$360 - 40 = \underline{\underline{320}}$

$189 = \frac{21 \times 18}{2}$

5 → 8°

16

~~20~~

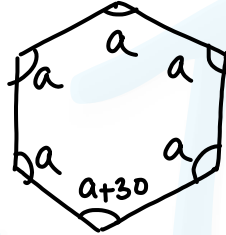
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Sum Int
↓

$$4 \times 180 = 6a + 30$$

$$\Rightarrow 4 \times 180 - 30 = 6a$$

$$115 = a$$



15. A closed polygon has six sides and one of its angles is 30° greater than each of the other five equal angles. What is the value of one of the equal angles?

एक बंद बहुभुज की 6 भुजाएं हैं और इसको एक कोण बाकी सभी पांचो समान कोणों से 30° ज्यादा है। उन सामान कोणों में से एक का मान क्या होगा?

a) 55°

b) 115°

c) 150°

d) 175°

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Int \angle 's \rightarrow 120, 125, 130, 135, -

Ext \angle 's \rightarrow 60, 55, 50, 45, - - - - -

Sum = 360

Using options

a) $9^{\text{th}} \rightarrow 60 - 40 = 20$

$$\frac{60+20}{2} \times 9 = 360$$

$$\begin{aligned} 5 + (-3) \\ = 5 - 3 = 2 \end{aligned}$$

$$\begin{aligned} 13^{\text{th}} &= 60 - 60 \\ &= 0 \end{aligned}$$

16. If the interior angles of a polygon are in A.P. with common difference 5° and the smallest angle 120° , then the number of sides of the polygon is:

अगर किसी बहुभुज के आंतरिक कोण समान्तर श्रेणी में हों जिनका साझा अंतर 5° हो और सबसे छोटा कोण 120° हो तो उस बहुभुज की भुजाओं की संख्या बताओ।

- a) 9 or 16 ~~b) 9~~
c) 13 d) 3 or 16

9th 10th 13th 14th 16

60, 55, 50, - - - -20, 15, 10, 5, 0, -5, -10, -15

360

7 \Rightarrow Sum
0

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Ques 16 without options'

60, 55, 50, 45, ...

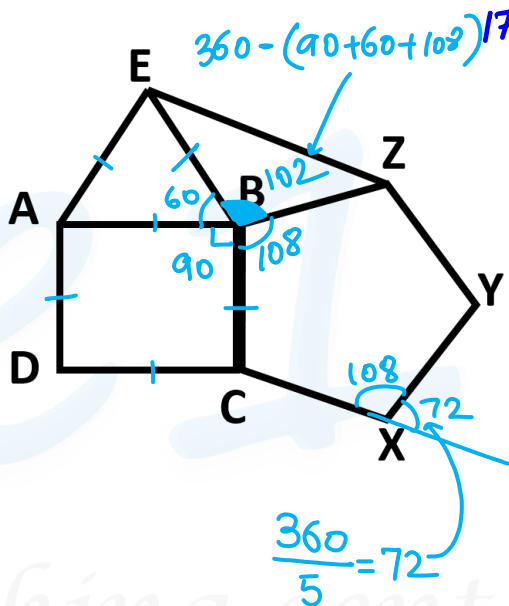
$$S_n = \frac{n}{2} [2a + (n-1)d]$$

$a = 60$
 $d = -5$

Quad eqn \rightarrow \sqrt{x}
9, 16

AP $\rightarrow S_9 = S_{16} \rightarrow S_9 + S_{10-16}$





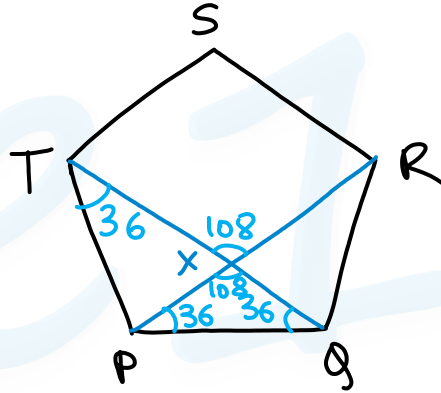
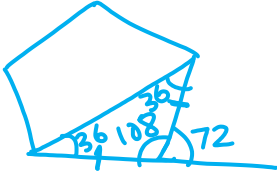
7. In the given figure, ABCD is a square. BCXYZ is a regular pentagon and ABE is an equilateral triangle. What is the value (in degrees) of $\angle EBZ$?

दी गई आकृति में, ABCD एक वर्ग है, BCXYZ एक पंचभुज है तथा ABE एक सम त्रिभुज है। $\angle EBZ$ का मान (डिग्री में) क्या है?

- a) 102
- b) 98
- c) 78
- d) 64

$$\frac{360}{5} = 72$$

coaching center



18. PQRST is a regular pentagon. If PR and QT intersect each other at X, then what is the value of (in degrees) of $\angle TXR$?

PQRST एक सम पंचभुज है। यदि PR तथा QT एक दुसरे को x पर प्रतिच्छेद करते हैं, तो $\angle TXR$ का मान क्या है? (डिग्री में)

a) 98

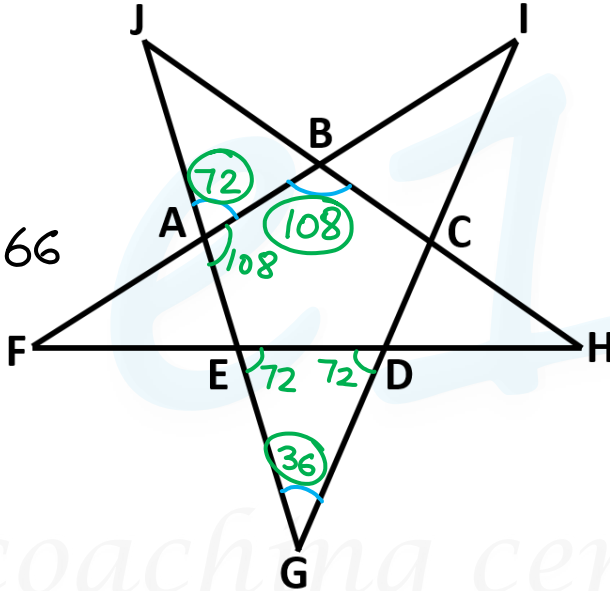
b) 90

c) 72

~~d) 108~~

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$$\begin{array}{r} 108 \\ 72 \\ \hline 216 \\ 396 \\ \hline 6 \end{array} = 66$$

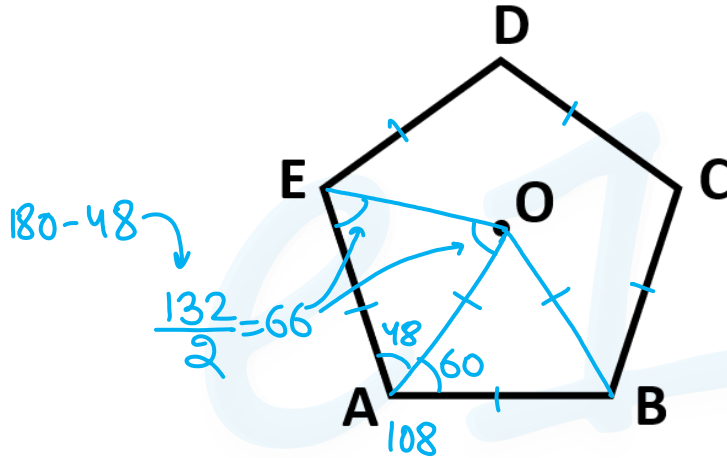


19. ABCDE is a regular pentagon. Its sides are extended as shown in the figure. The value of $\frac{\angle ABC + 2\angle EGD + 3\angle BAJ}{6}$ is:

ABCDE एक सम पंचभुज है। इसकी भुजाओं को आकृति में दर्शाए अनुसार बढ़ाया जाता है। $\frac{\angle ABC + 2\angle EGD + 3\angle BAJ}{6}$ का मान है:

- a) 45°
- b) 30°
- c) 75°
- d) ~~66°~~

coaching center

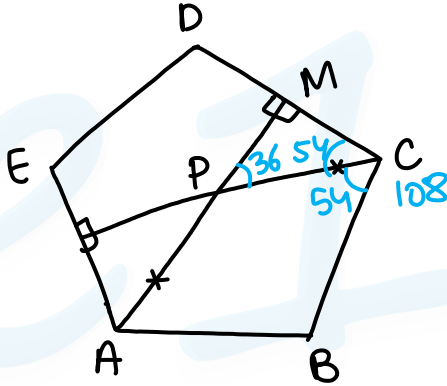
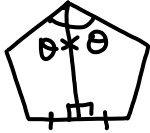
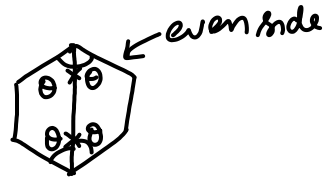


20. ABCDE is a regular pentagon. O is a point inside the pentagon such that AOB is an equilateral triangle. What is $\angle OEA$?

ABCDE एक सम पंचभुज है। O पंचभुज के अंदर एक बिंदु है जैसे कि AOB एक समबाहु त्रिभुज है। $\angle OEA$ क्या होगा?

- a) 66°
- b) 48°
- c) 54°
- d) 72°

coaching center

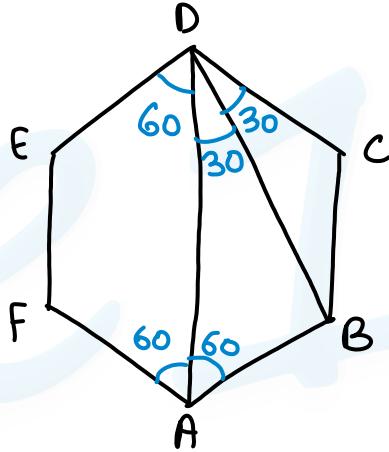
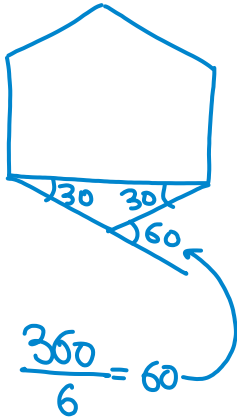


21. ABCDE is a regular pentagon. Angle bisector of $\angle BAE$ meets CD at M. Angle bisector of $\angle BCD$ meets AM at P. Find the $\angle CPM$.

ABCDE एक नियमित पंचकोण है। $\angle BAE$ का कोणसमद्विभाजक भुजा CD को बिंदु M पर मिलता है। $\angle BCD$ का समद्विभाजक भुजा AM को बिंदु P पर मिलता है। $\angle CPM = ?$

- a) 36° b) 44°
 c) 72° d) 54°

coaching center

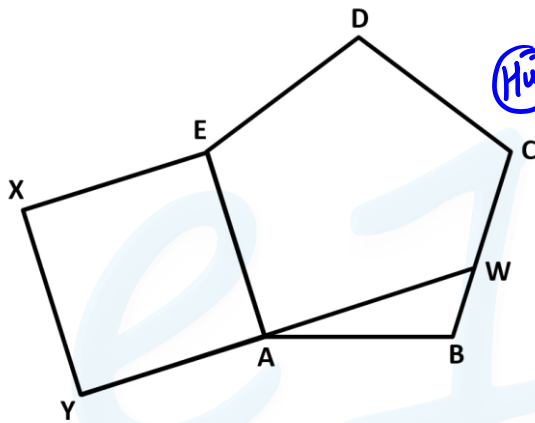


22. If ABCDEF is a regular hexagon, then what is the value (in degrees) of $\angle ADB$?

यदि ABCDEF एक सम षट्भुज है, तो $\angle ADB$ का मान (डिग्री में) क्या है?

- a) 15 ~~b) 30~~
 c) 45 d) 60

coaching center



(Hw)

23. ABCDE is a regular pentagon and AEXY is a square. When extended YA intersects BC at W. Find $\angle AWC$.

ABCDE एक सम पंचभुज है और AEXY एक वर्ग है. बढ़ाने पर YA BC को W पर काटती है. $\angle AWC$ का मान बताइए.

a) 116°

b) 120°

c) 136°

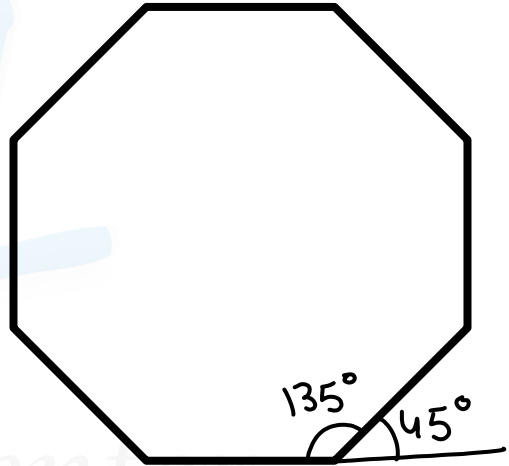
~~d) 126°~~

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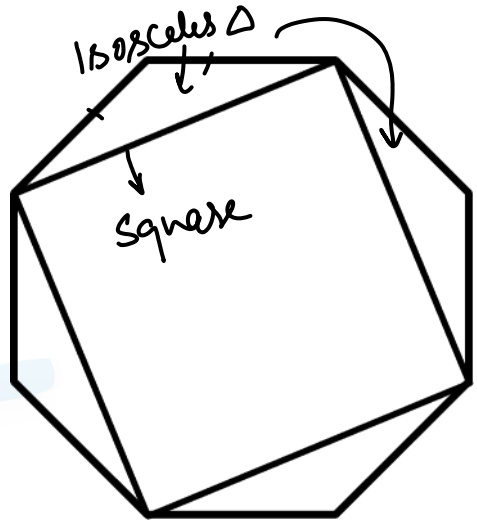
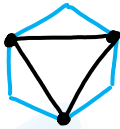
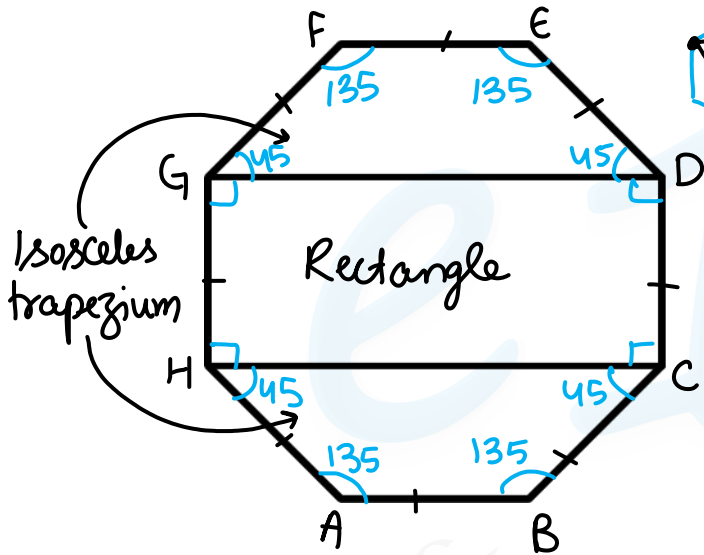
Octagon (अष्टभुज):

Regular

$$\frac{360}{8} = 45$$



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Length of smallest diagonal:

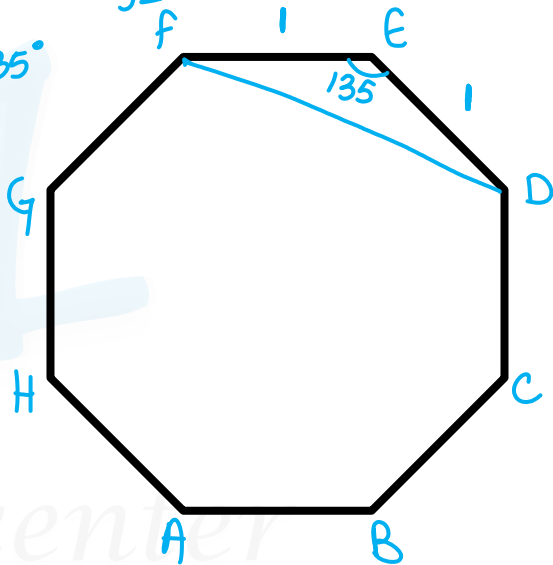
$$FD^2 = FE^2 + DE^2 - 2 FE \cdot DE \cos 135^\circ$$

$$= 1 + 1 - 2 \cdot 1 \cdot 1 \left(-\frac{1}{\sqrt{2}} \right)$$

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

$$FD = \sqrt{2 + \sqrt{2}}$$

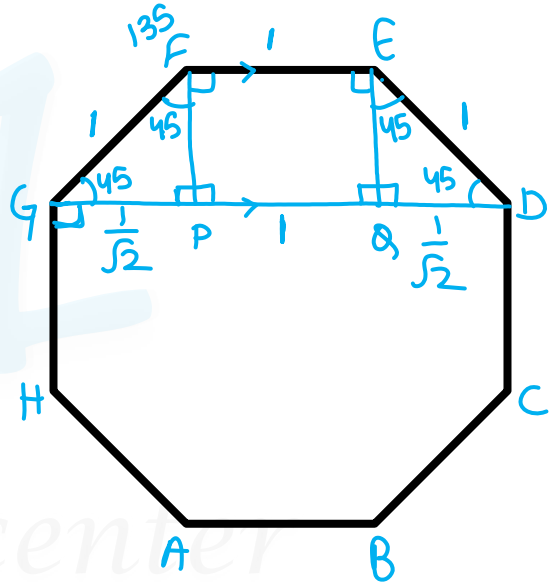
$$\cos(90+45) = \frac{-1}{\sqrt{2}}$$



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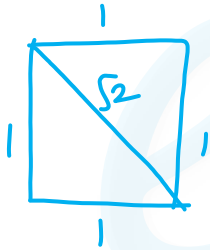
Length of 2nd smallest diagonal:

$$\begin{aligned}GD &= \frac{1}{\sqrt{2}} + 1 + \frac{1}{\sqrt{2}} \\ &= 1 + \sqrt{2}\end{aligned}$$



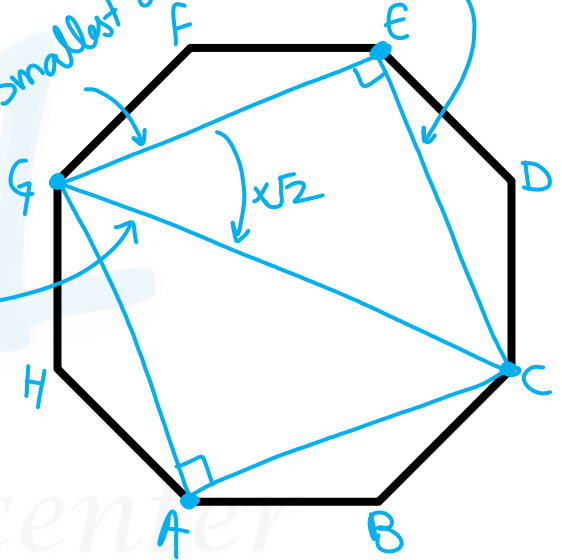
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Length of largest diagonal:

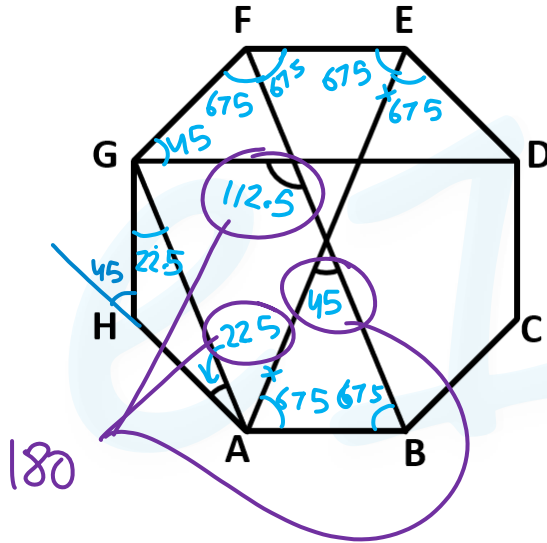


largest diagonal

Smallest diagonal



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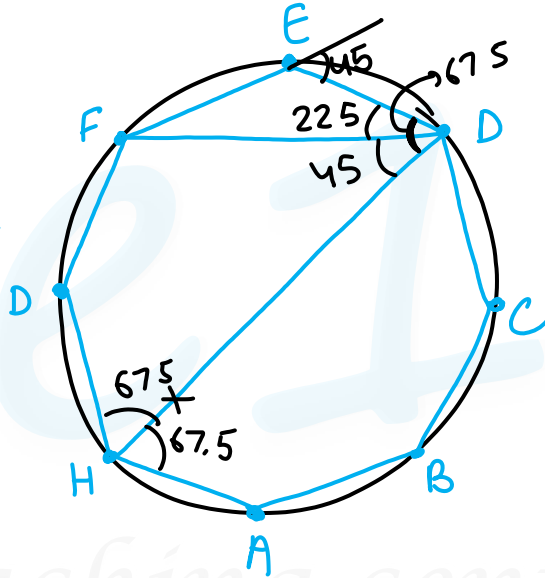
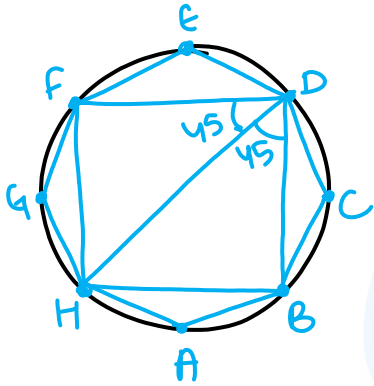


24. In the figure given below $ABCDEFGH$ is a regular octagon. Find the sum of all the marked angles.

दी गयी आकृति में $ABCDEFGH$ एक सम अष्टभुज है. सभी चिन्हित किये गए कोणों का योग बताइए.

- a) 360° b) 150°
 c) 135° ~~d) 180°~~

coaching center

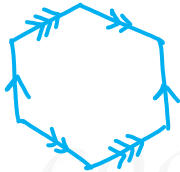
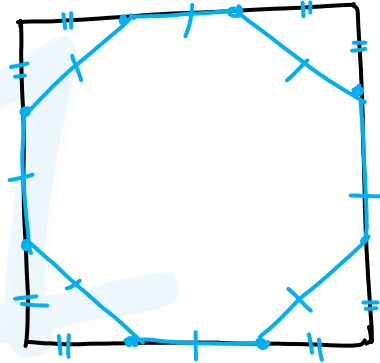
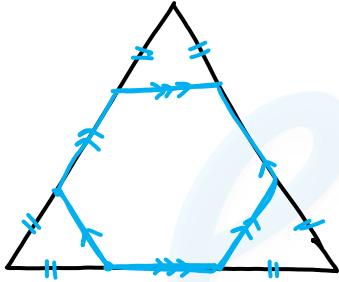


25. There are 8 equidistant points A, B, C, D, E, F, G and H on a circle. what is the value of $\angle FDH$?

एक वृत्त पर 8 बिंदु A, B, C, D, E, F, G तथा H समान दूरी पर हैं तो $\angle FDH$ का मान क्या है?

- a) 22.5 ~~b) 45~~
c) 30 d) 42.5

coaching center

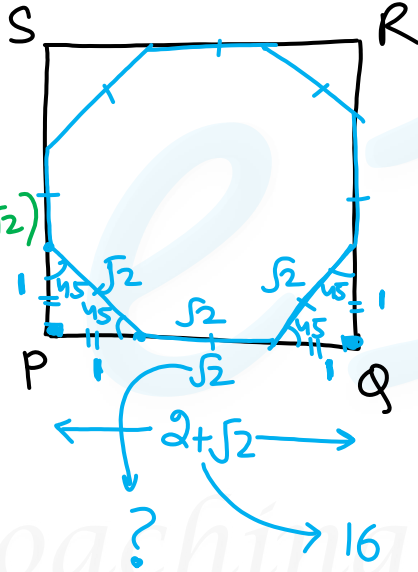


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26. PQRS is a square whose side is 16 cm. What is the value of the side (in cm) of the largest regular octagon that can be cut from the given square?

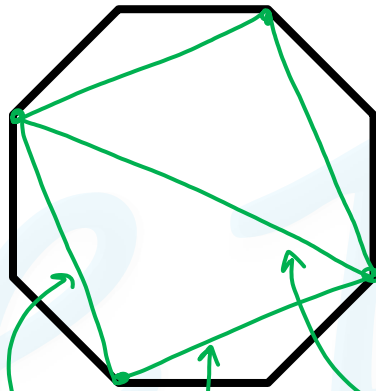
PQRS, 16cm भुजा वाला एक वर्ग है।
दिए गए वर्ग से काटे जा सकने वाले
सबसे बड़े सम अष्टभुज की भुजा
का मान (cm में) क्या है?

- a) $8 - 4\sqrt{2}$
- b) $16 + 8\sqrt{2}$
- c) $16\sqrt{2} - 16$
- d) $16 - 8\sqrt{2}$



$$\frac{8}{(2+\sqrt{2})^2} \times 16 \times \sqrt{2} (2-\sqrt{2})$$

$$= 16\sqrt{2} - 16$$



Shortest
diagonal

longest
diagonal.

27. What is the ratio of longest diagonal to the shortest diagonal in a regular octagon?

एक सम अष्टकोण में सबसे लंबे विकर्ण और सबसे छोटे विकर्ण का अनुपात क्या है?

a) $\sqrt{3} : 1$

b) $2 : 1$

c) $2 : \sqrt{3}$

~~d) $\sqrt{2} : 1$~~

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