

SSC FOUNDATION



सम्यान बैच

समय से तैयारी, समय से सफलता

MATHEMATICS

GEOMETRY - DAY 01

सबसे सटीक, सबसे बेहतर

LIVE STREAM : 11:00 AM

BY - SHASHI SIR





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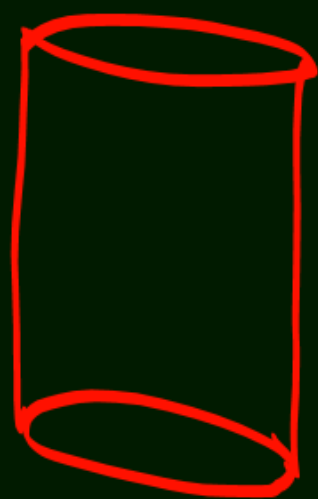
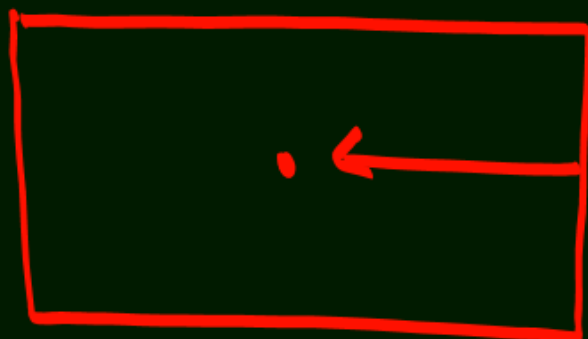
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* GEOMETRY (ज्यामिति) *

Geometry is the branch of mathematics that studies the size, Shape, Position and dimensions of things.

ज्यामिति गणित की वह शाखा है जो वस्तुओं के आकार, आकृति स्थिति और आयामों का अध्ययन करती है।



- * Line and Angles (रेखा और कोण)
- * Triangle (त्रिभुज)
- * Circle (वृत्त)
- * Quadrilateral (चतुर्भुज)

Geometry

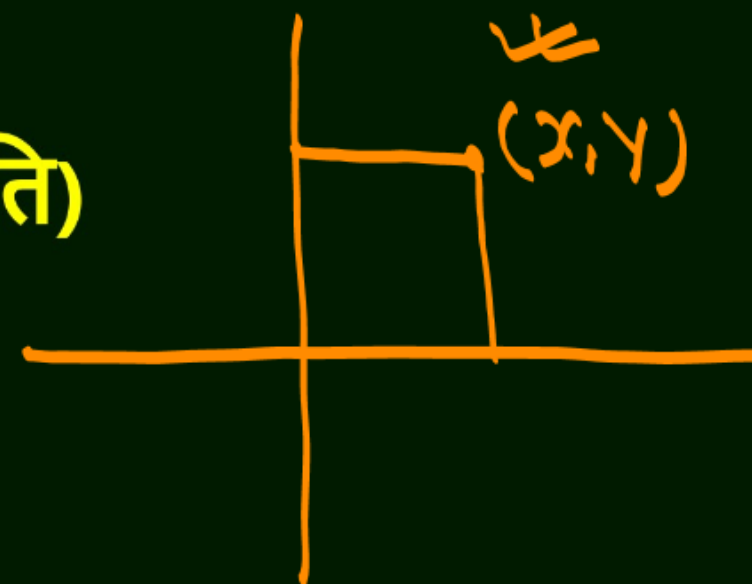
Plane Geometry
समतल ज्यामिति

3D Geometry

Co-ordinate geometry
(निर्देशांक ज्यामिति)

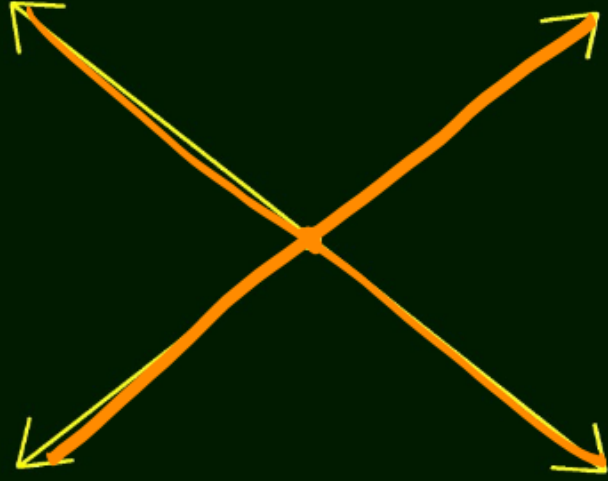
Plane Geometry (समतल ज्यामिति)

- ❖ **Point** (बिंदु) ⇒
- ❖ **Line** (रेखा) ⇔
- ❖ **Line segment** (रेखा खण्ड)
- ❖ **Ray** (किरण)



Line and angles

Intersecting Line (प्रतिच्छेदी रेखा)



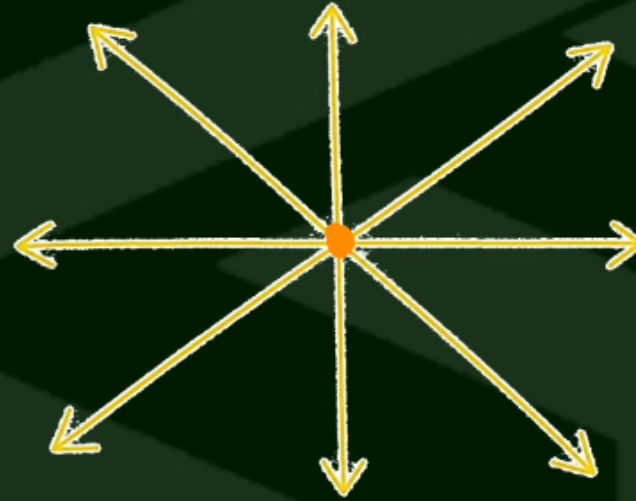
Perpendicular Lines (लंबवत रेखाएँ)



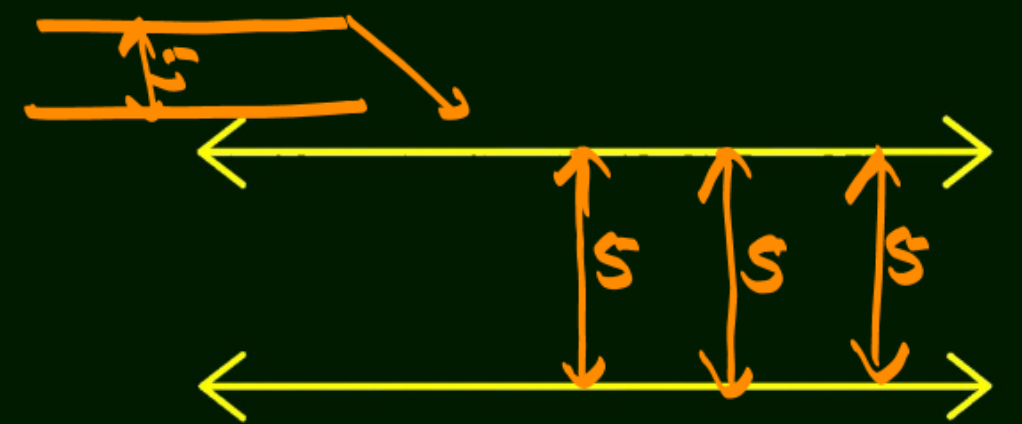
Types of

Line (रेखा)

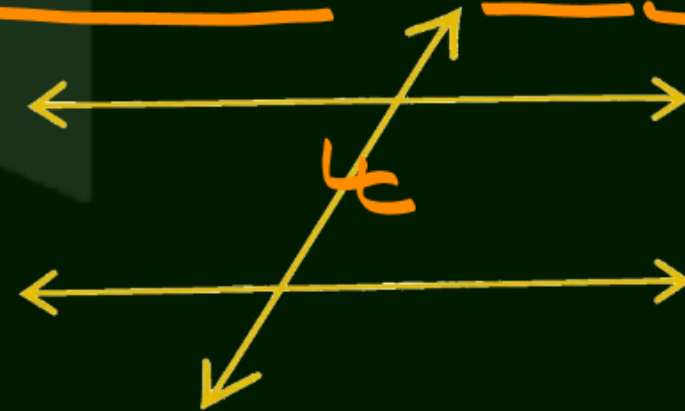
Concurrent line (संगामी रेखाएँ)



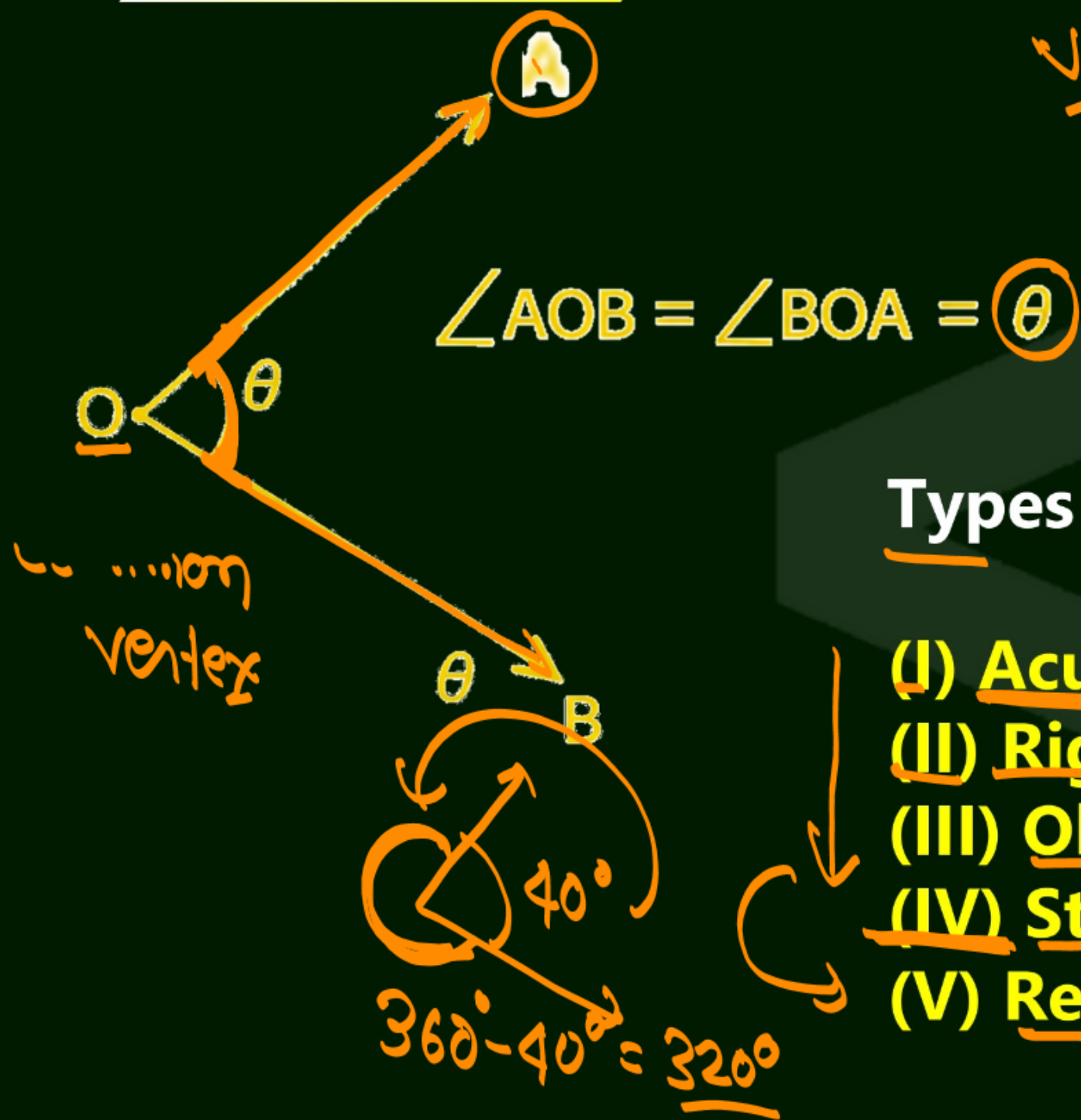
Parallel lines (समांतर रेखाएँ)



Transversal Lines (तिर्यक रेखाएँ)



Angles (कोण)

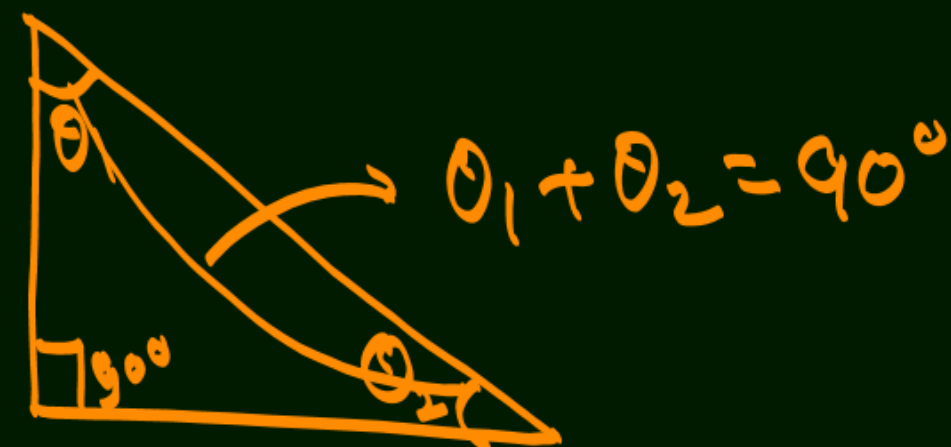


Pairs of Angles (कोणों का युग्म)

(I) Complementary Angles (पूरक कोण)

$$\theta_1 + \theta_2 = 90^\circ$$

Handwritten example: $40^\circ + 50^\circ = 90^\circ$



(II) Supplementary angle (संपूरक कोण)

$$\theta_1 + \theta_2 = 180^\circ$$

Handwritten example: $30^\circ + 150^\circ = 180^\circ$

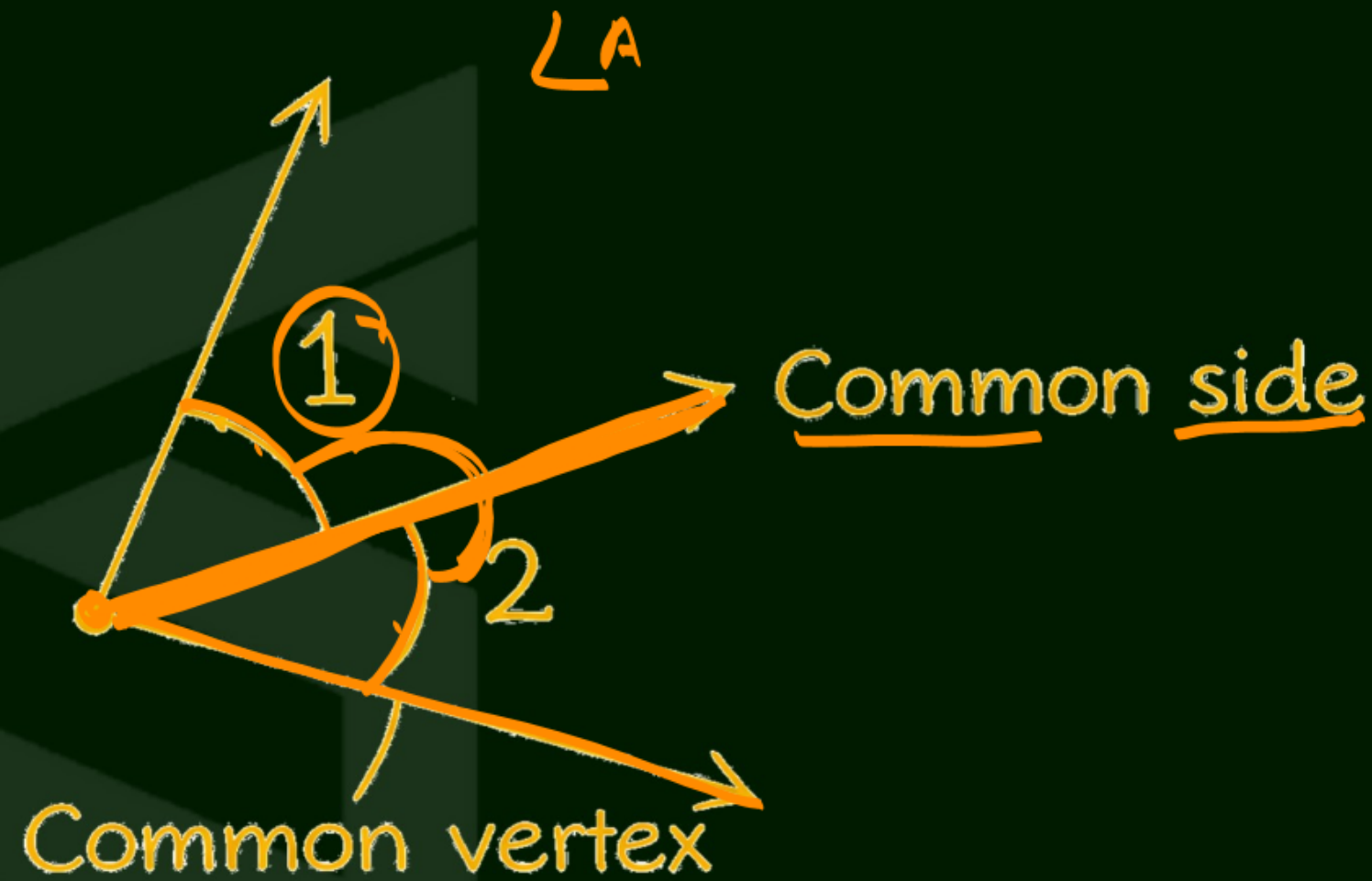
Questions Pattern $\rightarrow$ Relation between C.A and S.A

	θ	C.A. ($90^\circ - \theta$)	S.A. $180^\circ - \theta$
10°		80°	170°
20°		70°	160°
30°		60°	150°
40°		50°	140°
50°		40°	130°

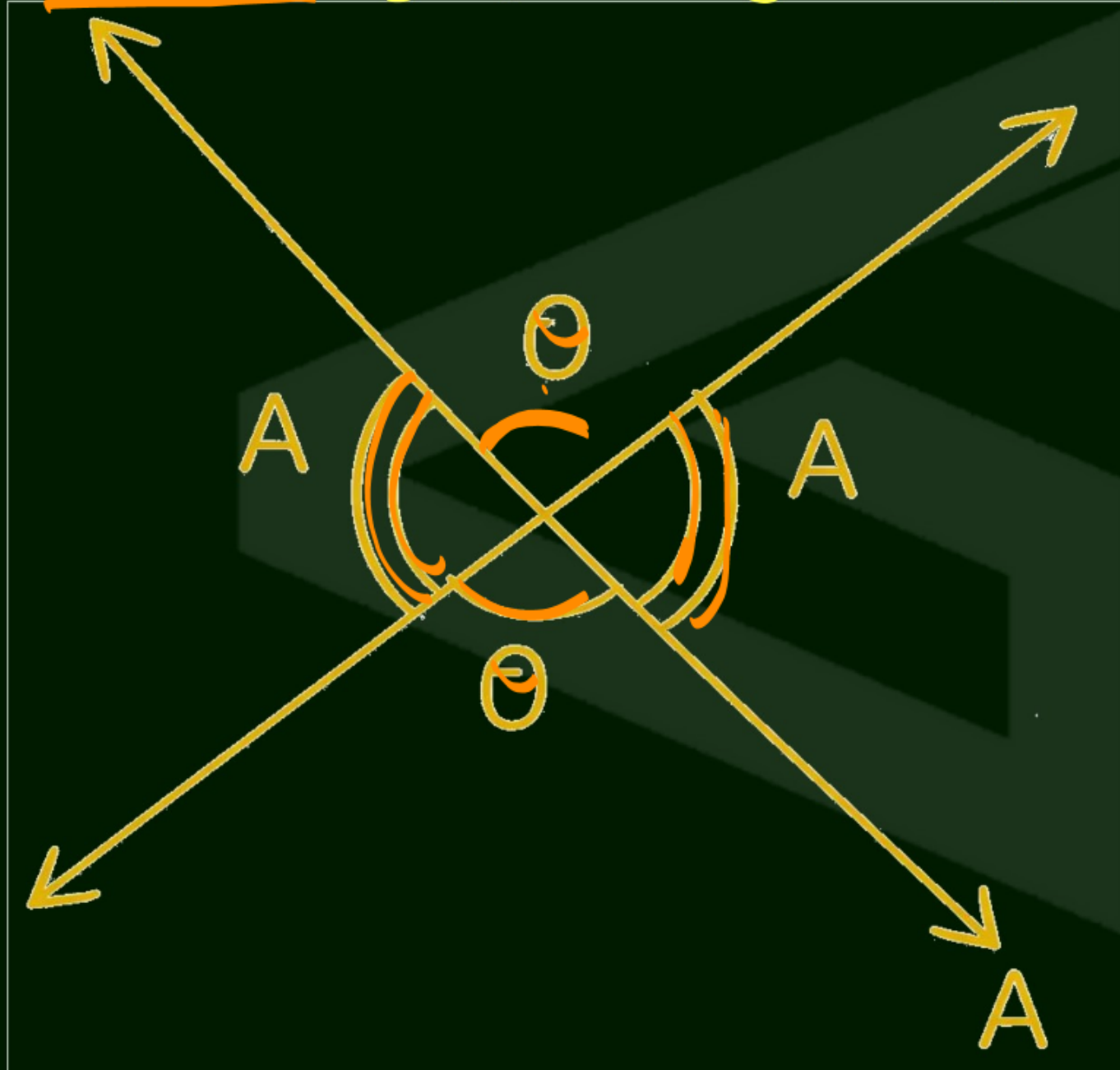
$\theta = 10^\circ$
C.A $\times 10$
S.A

Adjacent Angles (आसन्न कोण)

Note- $\angle 1$ और $\angle 2$ आसन्न कोण है।



vertically opposite Angle (शिर्षाभिमुख कोण)



1. Find the complementary angle of 32° .

32° का पूरक कोण ज्ञात करो।

(a) 50°

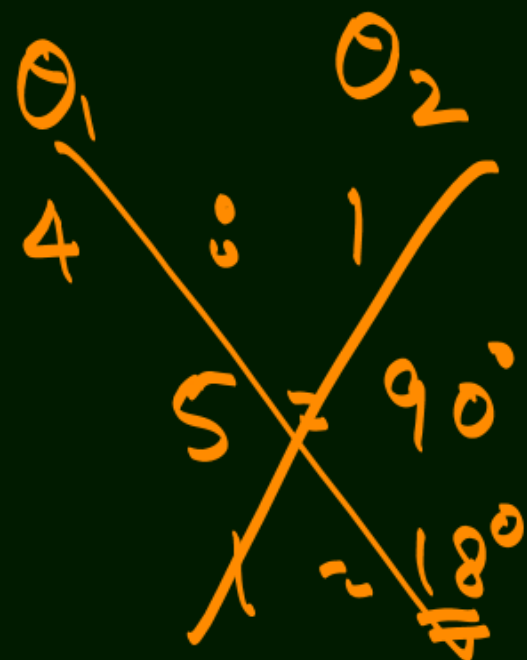
✓ (b) 58°

(c) 132°

(d) 148°

$$\theta = 32^\circ$$

$$\hookrightarrow \text{C.A} = 90^\circ - \theta = 90 - 32 = \boxed{58^\circ}$$



2. If one of angle is four times the complementary of the other angle. Find the angles.

यदि कोई कोण इसके पूरक कोण का चार गुना हो तो कोण ज्ञात करो।

- (a) 18°
~~(b) 72°~~
 (c) 15°
 (d) 60°

$$\begin{aligned} \theta &= (90^\circ - \theta) \times 4 \\ \theta &= 360^\circ - 4\theta \\ 5\theta &= 360^\circ \\ \theta &= 72^\circ \end{aligned}$$

3. Find the supplementary angle of 90° .
 90° का सम्पूरक कोण ज्ञात करो।

- ☒ (a) 90°
- (b) 60°
- (c) 140°
- (d) 40°

$$\theta = 90^\circ$$

$$\begin{aligned} \hookrightarrow \text{S.A} &= (180^\circ - \theta) \\ &= 180^\circ - 90^\circ = 90^\circ \end{aligned}$$

$$7x + 58^\circ + 16x + 53^\circ = 180^\circ$$

$$23x + 111^\circ = 180^\circ$$

$$23x = 69^\circ$$

$$x = 3^\circ$$

$$5x = \underline{\underline{15^\circ}}$$

4. If two supplementary angles are $(7x + 58)^\circ$ and $(16x + 53)^\circ$ then $5x$ is:

यदि दो सम्पूरक कोण $(7x + 58)^\circ$ व $(16x + 53)^\circ$ हैं तब $5x$ का मान क्या होगा।

(a) 3

✓ (b) 15

(c) 9

(d) 12

$$\begin{aligned}
 &\overset{\text{C.A}}{\theta} \longrightarrow 3(90^\circ - \theta) = \overset{\text{S.A}}{(180^\circ - \theta)} \\
 &270^\circ - 3\theta = 180^\circ - \theta \\
 &2\theta = 90^\circ \\
 &\theta = 45^\circ
 \end{aligned}$$

5. If supplementary angle of θ is thrice of complementary angle of θ then find the value of θ ?

θ के संपूरक कोण का मान θ के पूरक कोण के मान का 3 गुना है, तो θ का मान बताओ।

(a) 30°

✓ (b) 45°

(c) 55°

(d) 35°

$$x \rightarrow \overset{\text{S.A}}{(180^\circ - x)} \rightarrow \overset{\text{C.A}}{(90^\circ - x)}$$

$$(180^\circ - x) = 3(90^\circ - x) + 50^\circ$$

$$180^\circ - x = 270^\circ - 3x + 50$$

$$2x = 140^\circ$$

$$x = 70$$

$$\begin{array}{cc} \text{S.A} & \text{C.A} \\ (180 - 70) & (90 - 70) \\ 110^\circ & 20^\circ \\ \hline & 130^\circ \end{array}$$

6. The measure of supplement of $\angle x$ is 50° larger than thrice the measure of complement of angle of $\angle x$. What is the sum in degree of measure of the angle supplement and complement of $\angle x$?

कोण x का संपूरक कोण उसके कोटिपूरक के तीगुने से 50° अधिक है। कोण x के सम्पूरक और कोटिपूरक कोण का योग कितना होगा?

~~(a) 130°~~

(b) 140°

(c) 175°

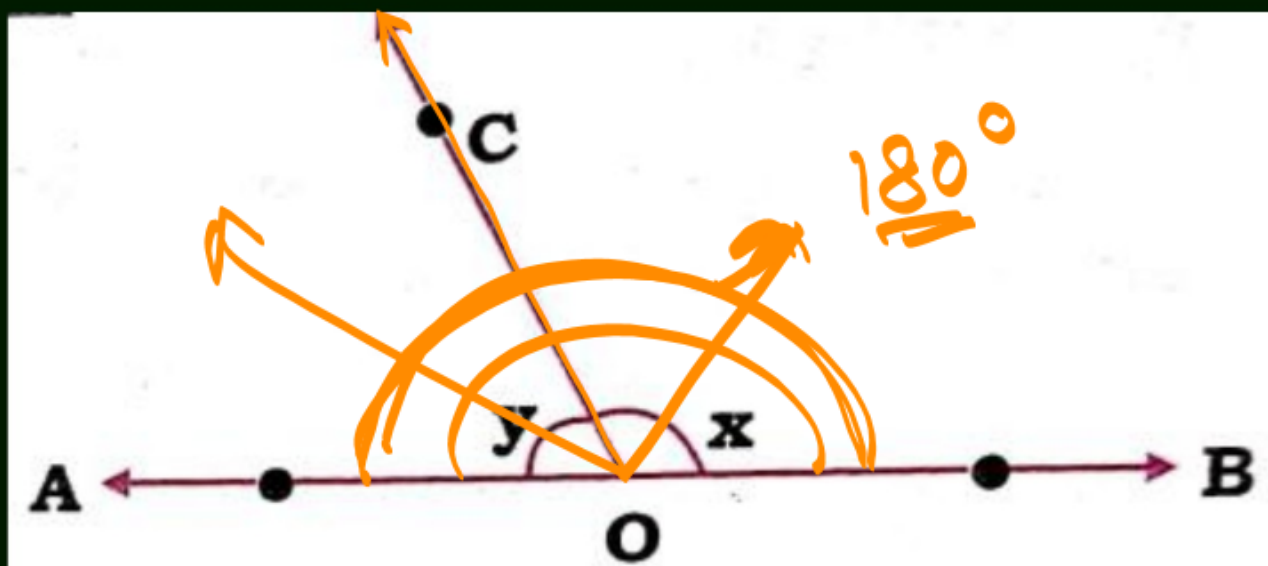
(d) 230°

H.W
=

7. The supplementary angle of angle A is $(12x + 6)^\circ$ and the complementary of angle A is $2x^\circ$. What is the value A?

कोण A का संपूरक कोण $(12x + 6)^\circ$ है और कोटिपूरक $2x^\circ$ है, A का मान ज्ञात करें?

- (a) 73.2°
- (b) 75.2°
- (c) 74.2°
- (d) 76.2°



$$x + y = 180^\circ$$

✓.✓.✓.✓ Linear pair/ रैखिक युग्म

A linear pair is a pair of adjacent angles whose non-common sides are opposite rays.

एक रैखिक युग्म आसन्न कोणों का एक युग्म है जिनकी उभयनिष्ठ (non & common) भुजा विपरीत किरण होती है।

✓✓ Linear pair angles are supplementary

रैखिक युग्म के कोण संपूरक होते हैं।

$\angle x$ and $\angle y$ are linear pair and $\angle x + \angle y = 180^\circ$

$\angle x, \angle y$ एक रैखिक युग्म है तथा $\angle x + \angle y = 180^\circ$



$$\angle a + \angle b = 180^\circ \quad 8.$$

$$\angle a = 180^\circ - 50^\circ = 130^\circ$$

S.A

$$b = (180^\circ - b) \times \frac{1}{5} + 24$$

$$5(b - 24) = 180^\circ - b$$

$$6b = 300$$

$$b = 50^\circ$$

A-T. Q

$$\angle \frac{A}{2} = \frac{130^\circ}{2} = 65^\circ$$

$$\angle A = 90^\circ - 65^\circ = 25^\circ$$

Angles a and b are linear pair. b is 24° more than one fifth of its supplementary angle. Find the complementary of half of a:

कोण a व b रेखीय युग्म है। b अपने संपूरक कोण के $\frac{1}{5}$ से 24° ज्यादा है। a के आधे का पूरक ज्ञात करो।

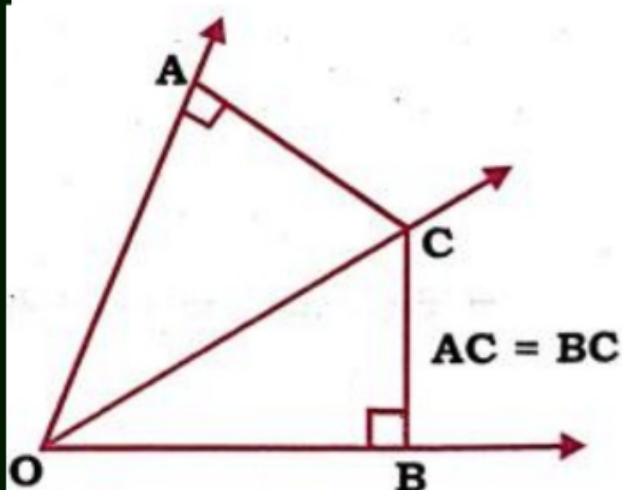
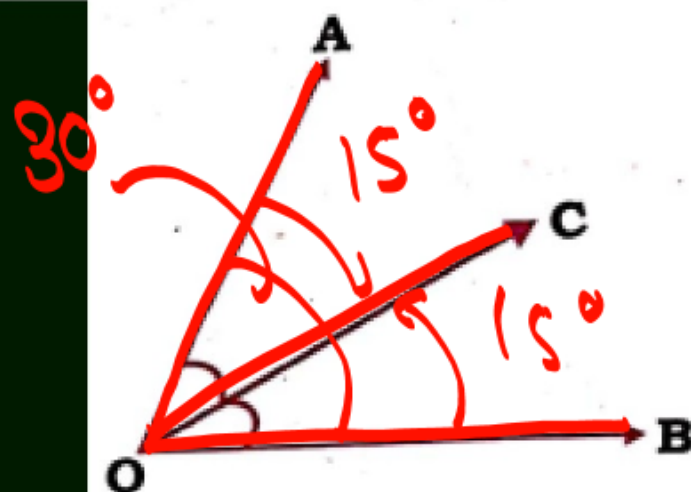
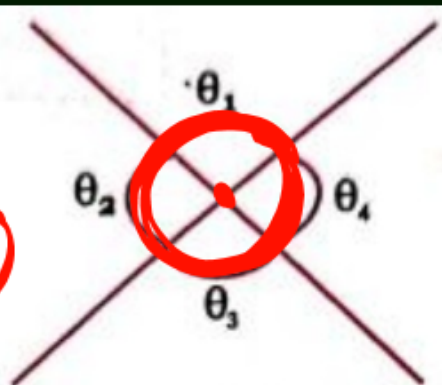
$$(a) 25^\circ$$

$$(b) 10^\circ$$

$$(c) 15^\circ$$

$$(d) 20^\circ$$

$$\theta_1 + \theta_2 + \theta_3 + \theta_4 = 360^\circ$$



Angles around the ^{Point} ~~point~~/बिंदु के चारों ओर कोण

When a line segment divides an angle equally into two parts, then it is said to be the angle bisector.

जब एक रेखाखण्ड किसी कोण को दो बराबर भागों में बांटता है, तो उसे कोण समद्विभाजक कहते हैं।

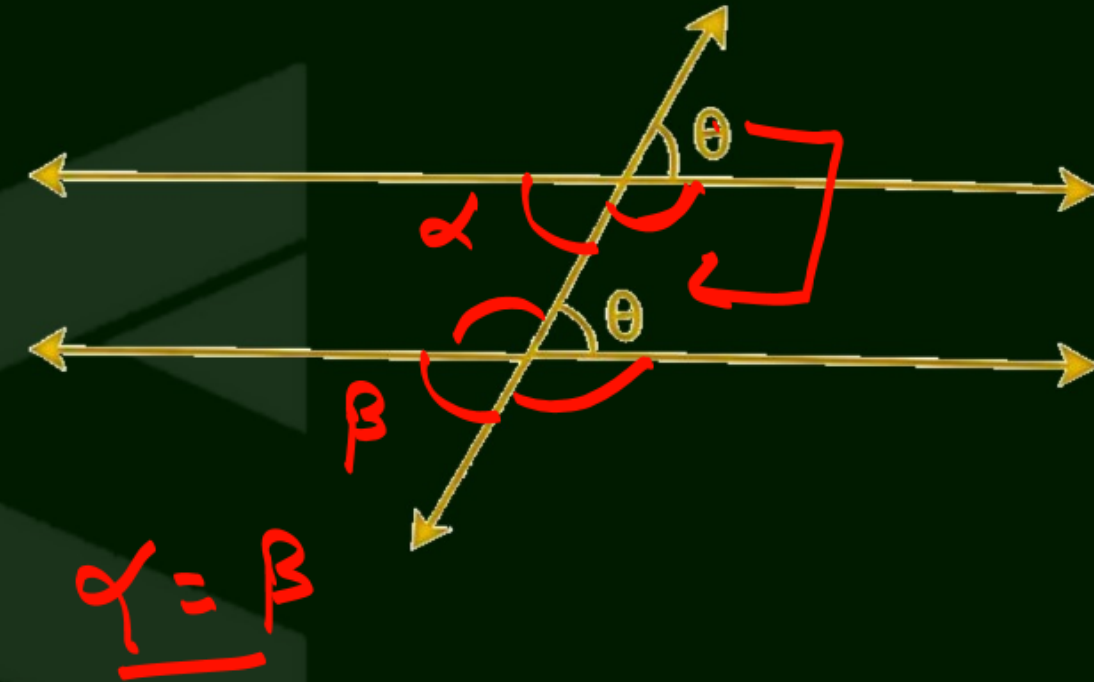
OC is the angle bisector of $\angle AOB$.

i.e, $\angle AOC = \angle BOC = \frac{1}{2} (\angle AOB)$

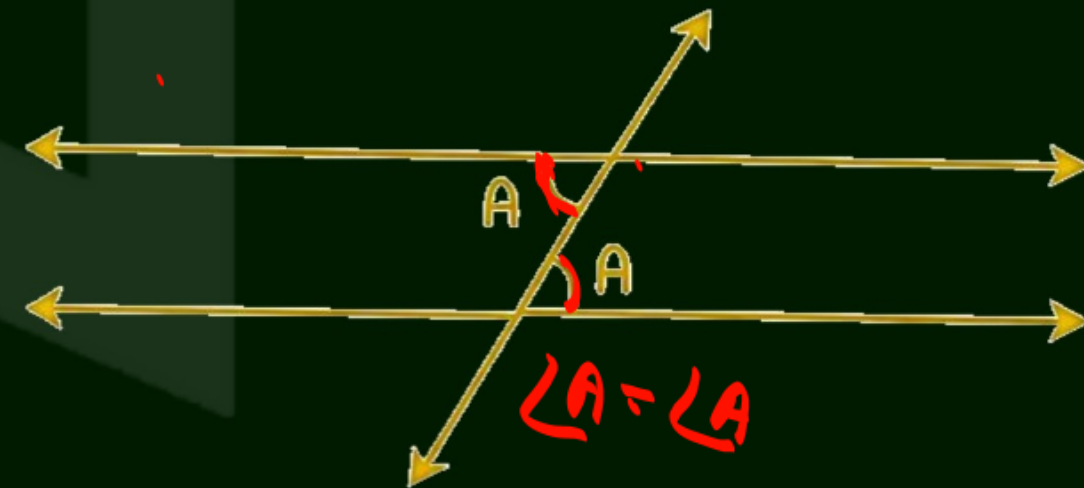
Angle bisector is equidistant from the two sides of the angle.

कोण समद्विभाजक कोण के दोनों पक्षों से समान दूरी पर होता है।

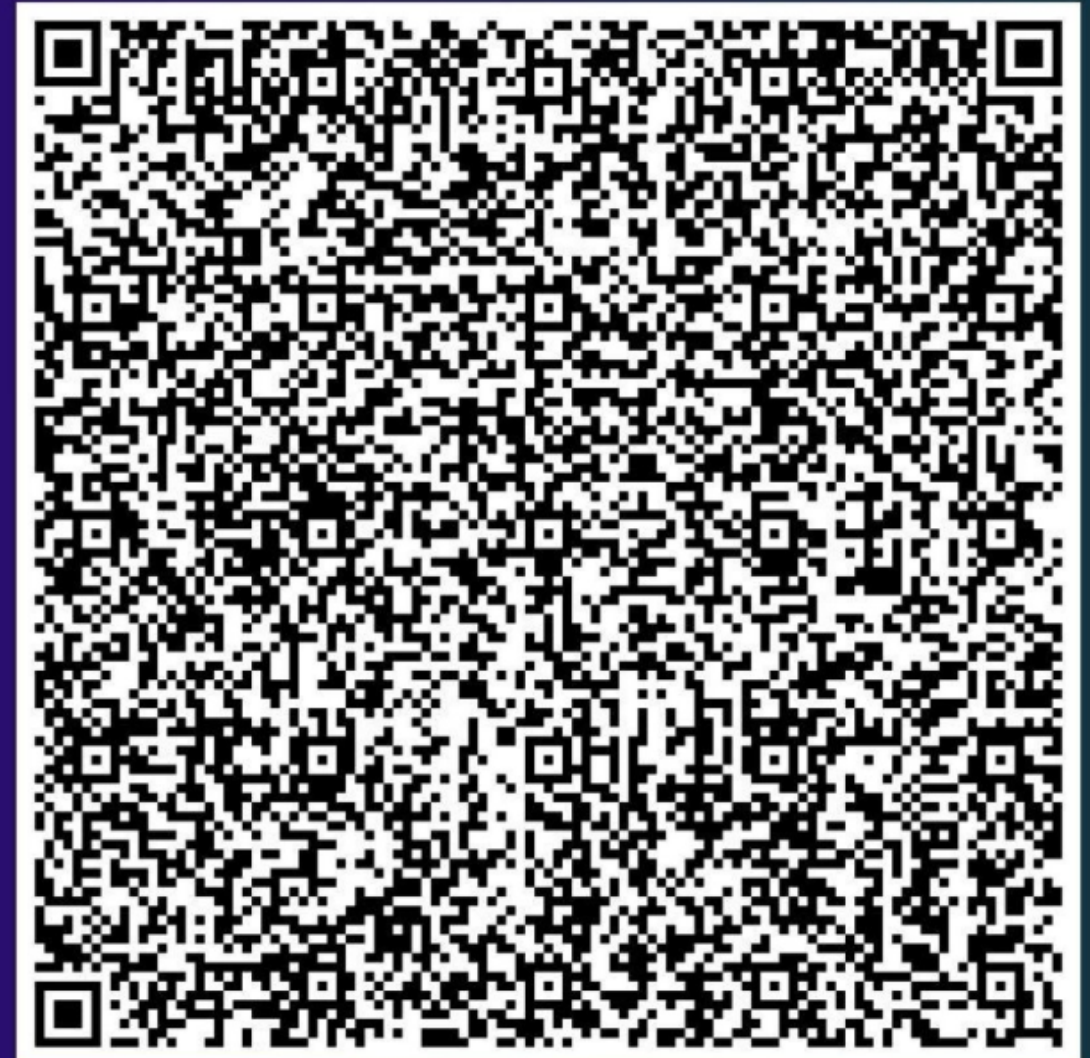
Corresponding angles/संगत कोण



Alternate Interior angle / एकांतर अंतः कोण



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