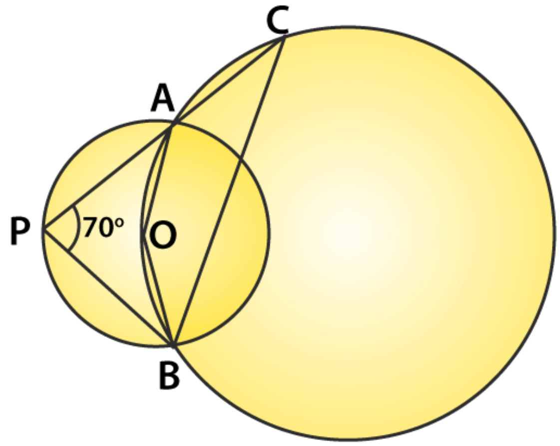
Exercise VSAQs

Question 1: In figure, two circles intersect at A and B. The centre of the smaller circle is O and it lies on the circumference of the larger circle. If ∠APB = 70°, find ∠ACB.



Solution:

By degree measure theorem: ∠AOB = 2 ∠APB

so, ∠AOB = 2 × 70° = 140°

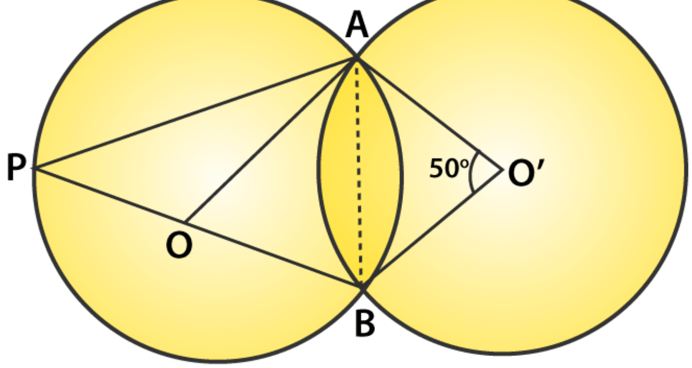
Since AOBC is a cyclic quadrilateral, we have

∠ACB + ∠AOB = 180°

∠ACB + 140° = 180°

∠ACB = 40°

Question 2: In figure, two congruent circles with centres O and O' intersect at A and B. If ∠AO'B = 50°, then find ∠APB.

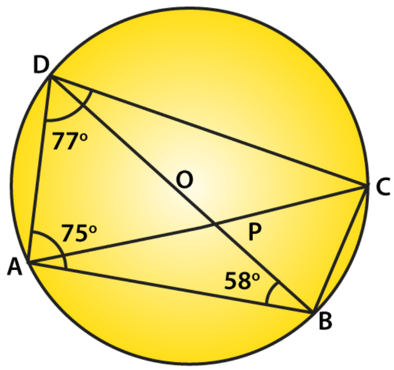


Solution:

As we are given that, both the triangle are congruent which means their corresponding angles are equal.
Therefore, ∠AOB = AO'B = 50°

Now, by degree measure theorem, we have
∠APB = ∠AOB/2 = 25^0

Question 3: In figure, ABCD is a cyclic quadrilateral in which ∠BAD=75°, ∠ABD=58° and ∠ADC=77°, AC and BD intersect at P. Then, find ∠DPC.

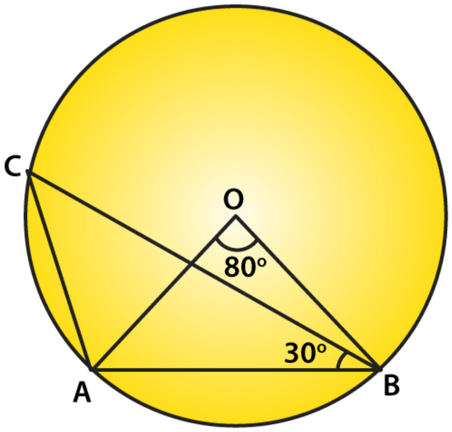


Solution:
∠DBA = ∠DCA = 58^0 ...(1)
[Angles in same segment]

ABCD is a cyclic quadrilateral :
Sum of opposite angles = 180 degrees
∠A +∠C = 180^0
75^0 + ∠C = 180^0
∠C = 105^0

Again, ∠ACB + ∠ACD = 105^0
∠ACB + 58^0 = 105^0
or ∠ACB = 47^0 ...(2)
Now, ∠ACB = ∠ADB = 47^0
[Angles in same segment]
Also, ∠D = 77^0 (Given)
Again From figure, ∠BDC + ∠ADB = 77^0
∠BDC + 47^0 = 77^0
∠BDC = 30^0
In triangle DPC
∠PDC + ∠DCP + ∠DPC = 180^0
30^0 + 58^0 + ∠DPC = 180^0
or ∠DPC = 92^0 .

Question 4: In figure, if ∠AOB = 80° and ∠ABC=30°, then find ∠CAO.



Solution:

Given: $\angle AOB = 80^0$ and $\angle ABC = 30^0$
To find: ∠CAO

Join OC.

Central angle subtended by arc AC = ∠COA
then $\angle COA = 2 \times \angle ABC = 2 \times 30^0 = 60^0$ ...(1)

In triangle OCA,
OC = OA
[same radii]
∠OCA = ∠CAO ...(2)
[Angle opposite to equal sides]

In triangle COA,

$\angle OCA + \angle CAO + \angle COA = 180^0$

From (1) and (2), we get

$2\angle CAO + 60^0 = 180^0$

$\angle CAO = 60^0$