Circles Ex 10.2 Q5

From the property of tangents we know that the length of two tangents drawn to a circle from a common external point will be equal. Therefore we have the following,

$AF = AE$

$FB = BG$

$DH = ED$

$HC = CG$

Replacing for all the above in equation (1), we have

$AB + DC = AE + BG + ED + CG$

$AB + DC = (AE + ED) + (BG + CG)$

$AB + DC = AD + BC$

Thus we have proved that the sum of the pair of opposite sides of the quadrilateral is equal to the sum of the other pair.

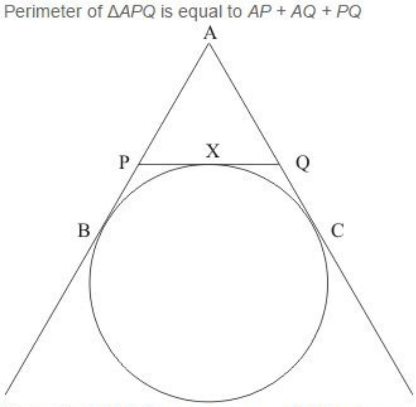
Circles Ex 10.2 Q6

Answer :

We have been asked to find the perimeter of the triangle *APQ*.

Therefore,

Perimeter of ΔAPQ is equal to $AP + AQ + PQ$



By looking at the figure, we can rewrite the above as follows,

Let the Perimeter of ΔAPQ be P. So $P = AP + AQ + PX + XQ$

From the property of tangents we know that when two tangents are drawn to a circle from the same external point, the length of the two tangents will be equal. Therefore we have,

$PX = PB$

$XQ = QC$

Replacing these in the above equation we have,

$P = AP + AQ + PB + QC$

From the figure we can see that,

$AP + PB = AB$

$AQ + QC = AC$

Therefore, we have, $P = AB + AC$

It is given that $AB = 5$ cm.

Again from the same property of tangents we know that that when two tangents are drawn to a circle from the same external point, the length of the two tangents will be equal. Therefore we have,

$AB = AC$

Therefore,

$AC = 5$ cm

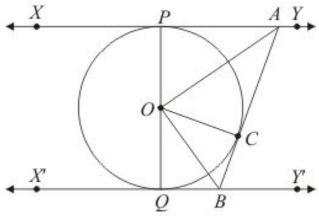
Hence,

$P = 5 + 5 = 10$

Thus the perimeter of triangle *APQ* is 10 cm.

Circles Ex 10.2 Q7

Answer :



Given: *XY* and *X'Y'* at are two parallel tangents to the circle with centre *O* and *AB* is the tangent at the point *C*, which intersects *XY* at *A* and *X'Y'* at B.

To Prove: $\angle AOB = 90°$

Construction: Let us joint point *O* to *C*.

Proof:

In ΔOPA and ΔOCA, we have

$OP = OC$ (Radii of the same circle)

$AP = AC$ (Tangents from point *A*)

$AO = AO$ (Common side)

$\Delta OPA \cong \Delta OCA$ (SSS congruence criterion)

Therefore, $\angle POA = \angle COA$ ……(*i*) (C.P.C.T)

Similarly, $\Delta OQB \cong \Delta OCB$ ……(*ii*)

Since *POQ* is a diameter of the circle, it is a straight line.

Therefore, $\angle POA + \angle COA + \angle COB + \angle QOB = 180°$

From equations (*i*) and (*ii*), it can be observed that

$2\angle COA + 2\angle COB = 180°$

$\therefore \angle COA + \angle COB = 90°$

So, $\angle AOB = 90°$.

*********** END **********