



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.

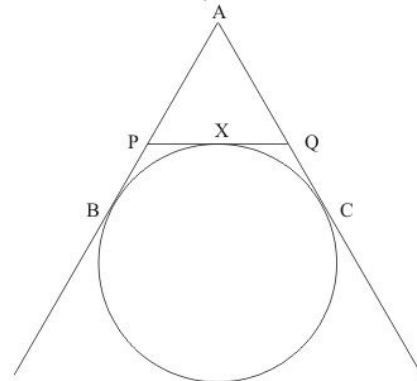
Circles Ex 10.2 Q6

Answer :

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

Therefore,

Perimeter of $\triangle APQ$ is equal to $AP + AQ + PQ$



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

Let the Perimeter of $\triangle APQ$ 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 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,

$$AC = 5 \text{ cm}$$

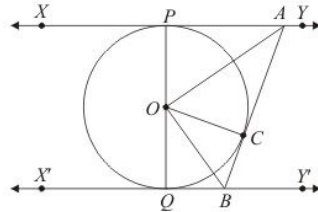
Hence,

$$P = 5 + 5 = 10$$

Thus the perimeter of triangle APQ is 10 cm.

Circles Ex 10.2 Q7

Answer :



Given: XY and $X'Y'$ 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: $\angle AOB = 90^\circ$

Construction: Let us join point O to C .

Proof:

In $\triangle OPA$ and $\triangle OCA$, we have

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

$AP = AC$ (Tangents from point A)

$AO = AO$ (Common side)

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

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

Similarly, $\triangle OQB \cong \triangle OCB$ (ii)

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

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

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

$$2\angle COA + 2\angle COB = 180^\circ$$

$$\therefore \angle COA + \angle COB = 90^\circ$$

So, $\angle AOB = 90^\circ$.

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