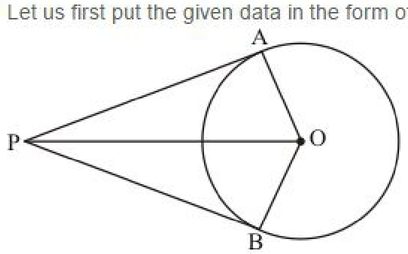
Circles Ex 10.2 Q13

Answer :

Let us first put the given data in the form of a diagram. We have,



Consider ΔPAO and ΔPBO. We have,

Here, PO is the common side.

PA = PB (Length of two tangents drawn from the same external point will be equal)

OA = OB(Radii of the same circle)

By SSS congruency, we have ΔPAO is congruent to ΔPBO.

Therefore,

$\angle APO = \angle BPO$

It is given that,

$\angle APB = 120^{\circ}$

That is,

$\angle APO + \angle BPO = 120^{\circ}$

$2\angle APO = 120^{\circ}$ (Since $\angle APO = \angle BPO$)

$\angle APO = 60^{\circ}$

In ΔPAO,

$\angle PAO = 90^{\circ}$ (Since radius will be perpendicular to the tangent at the point of contact)

We know that,

$$\cos 60 = \frac{AP}{PO}$$

$$\frac{1}{2} = \frac{AP}{OP}$$

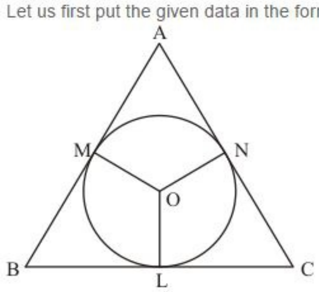
$OP = 2AP$

Thus we have proved.

Circles Ex 10.2 Q14

Answer :

Let us first put the given data in the form of a diagram.



It is given that triangle *ABC* is isosceles with

AB = *AC* ...... (1)

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

AM + *MB* = *AN* + *NC*

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

AM = *AN*

Let us substitute *AN* with *AM* in the equation (1). We get,

AM + *MB* = *AM* + *NC*

MB = *NC* ...... (2)

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

MB = *BL*

NC = *LC*

But from equation (2), we have found that

MB = *NC*

Therefore,

BL = *LC*

Thus we have proved that point L bisects side *BC*.

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