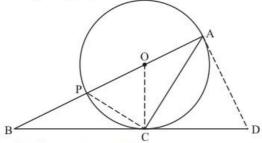


## Circles Ex 10.2 Q17 Answer:

In the given figure, let us join D an A.



Consider  $\triangle OCA$ . We have,

OC = OA (Radii of the same circle)

We know that angles opposite to equal sides of a triangle will be equal. Therefore,

 $\angle OCA = \angle OAC$  ..... (1)

It is clear from the figure that

 $\angle DCA + \angle OCA = \angle OCD$ 

Now from (1)

 $\angle DCA + \angle OAC = \angle OCD$ 

Now as BD is tangent therefore  $\angle OCD = 90^{\circ}$ 

Therefore  $\angle DCA + \angle OAC = 90^{\circ}$ 

From the figure we can see that  $\angle OAC = \angle BAC$ 

 $\angle DAC + \angle BAC = 90^{\circ}$ 

Thus we have proved.

## Circles Ex 10.2 Q18

Answer:

We know that the lengths of tangents drawn from an external point to a circle are equal.

In the given figure, TQ and TP are tangents drawn to the same circle from an external point T.

Also, TP and TR are tangents drawn to the same circle from an external point T.

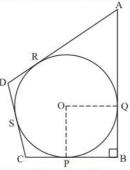
From (1) and (2), we get

TQ = TR

Circles Ex 10.2 Q19

## Answer:

Let us first consider the quadrilateral OPBQ.



It is given that  $\angle B = 90^{\circ}$ 

Also from the property of tangents we know that the radius of the circle will always be perpendicular to the tangent at the point of contact. Therefore we have,

 $\angle OPB = 90^{\circ}$ 

 $\angle OQB = 90^{\circ}$ 

We know that sum of all angles of a quadrilateral will always be equal to  $\,360^{\circ}$  . Therefore,

 $\angle B + \angle OPB + \angle OQB + \angle POQ = 360^{\circ}$ 

 $90^{\circ} + 90^{\circ} + 90^{\circ} + \angle POQ = 360^{\circ}$ 

 $270^\circ + \angle POQ = 360^\circ$ 

 $\angle POQ = 90^{\circ}$ 

Also, in the quadrilateral,

OQ = OP (both are the radii of the same circle)

PB = BQ (from the property of tangents which says that the length of two tangents drawn to a circle from the same external point will be equal)

Since the adjacent sides of the quadrilateral are equal and also since all angles of the quadrilateral are equal to 90°, we can conclude that the quadrilateral OPBQ is a square.

It is given that DS = 5 cm.

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

DS = DR

DR = 5

It is given that,

AD = 23

DR + RA = 23

5 + RA = 23

RA = 18

Again from the same property of tangents we have,

RA = AQ

We have found out RA = 18. Therefore,

AQ = 18

It is given that AB = 29. That is,

AQ + QB = 29

18 + QB = 29

QB = 11

We have initially proved that OPBQ is a square. QB is one of the sides of the square. Since all sides of the square will be of equal length, we have,

OP = 11

OP is nothing but the radius of the circle.

Thus the radius of the circle is equal to 11 cm.

\*\*\*\*\*\* END \*\*\*\*\*\*\*