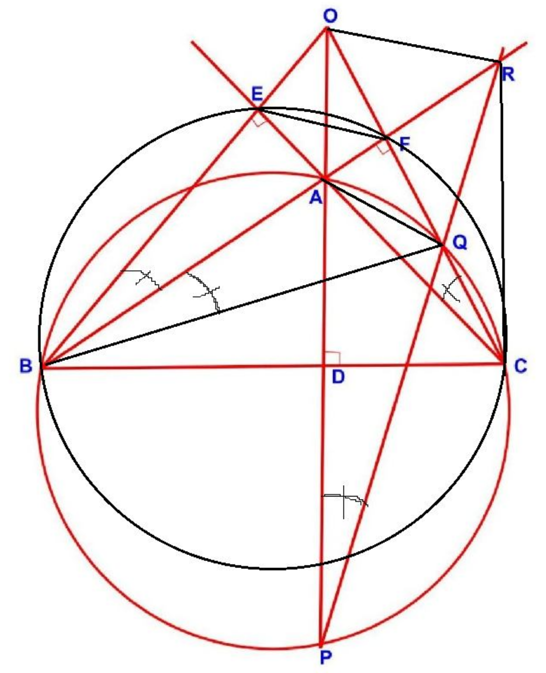

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Construction: Join OR, AQ , RC, QB & EF

By taking BC as diameter and $\angle BEC = \angle BFC = 90^0$, we can construct a circle passes through B, C, E, F.

Proof: ∠EBF = ∠ECF (Angle on the same segment EF) --------------(1)

$\angle APQ = \angle ACQ =$ ∠ABQ (Angle on the same segment AQ) --------------(2)

As <ECF = <ACQ, so <EBF = <APQ = <ECF = <ACQ -------------(3)

In triangle OAB and triangle RAP

<OBA = <RPA (from 3)

<OAB = <RAP (Ver cally Opposite angle)

Hence ΔOAB~ΔRAP --(5)

In triangle OBQ, <FBQ=<FBO and BF ⊥ OQ

ΔOBQ is an isosceles triangle with BO = OQ and OF = FQ.

<BOQ = <BQO (Opposite angle of equal sides). -------------------(6)

In triangle ORQ, OF = FQ and RF ⊥ OQ

ΔROQ is an isosceles triangle with OR = RQ.

Hence ER is the angle bisector of <ORQ

So, <ORF = <QRF ---------------(7)

In triangle ROB and triangle RAP

<OBR = <RPA (from 3)

<ORB = <ARP (from 7)

⇒ ΔROB~ΔRAP --(8)

From (5) and (7) ΔROB~ΔOAB

Hence Ra o of their sides are equal

OB/AB = RB/OB

$\Rightarrow OB^2 = AB \times RB$ (PROVED)