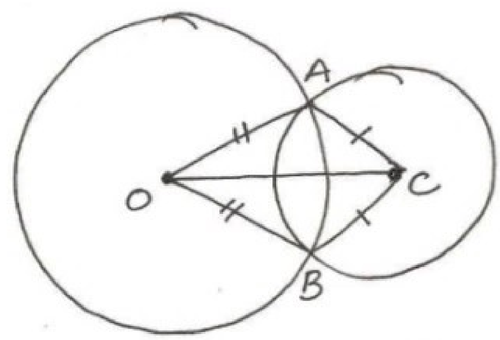
(1)



To Prove $\angle OAC = \angle OBC$

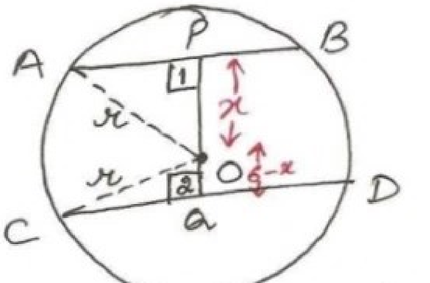
Proof In $\triangle OAC$ and $\triangle OBC$

$OA = OB$ [radii of same ⊙]
$CA = CB$
$OC = OC$

$\therefore \triangle OAC \cong \triangle OBC$ by SSS prop.

$\angle OAC = \angle OBC$ [c.p.c.t.]

(2)



To find - radius of ⊙

Const - join OA, OC

Proof - let $OP = x$ cm

$OQ = (6-x)$ cm

In rt $\triangle OPA$

$OA^2 = OP^2 + AP^2$ [Py. th.]

$r^2 = x^2 + 2.5^2$

$\Rightarrow r^2 = x^2 + 6.25 \cdots$ (I)

$OP \perp AB$

$\Rightarrow AP = \frac{1}{2}AB$ [Per. from the centre of the ⊙ to the chord bisects it]

$= \frac{1}{2} \times 5$

$= 2.5$ cm

Sim. $CQ = 5.5$ cm

In rt $\triangle CQO$

$OC^2 = OQ^2 + CQ^2$ (Py. th.)

$r^2 = (6-x)^2 + 5.5^2$

$\Rightarrow r^2 = 36 + x^2 - 12x + 30.25 \cdots$ (II)

From (I), (II)

$\cancel{x^2} + 6.25 = 36 + \cancel{x^2} - 12x + 30.25$

$\Rightarrow 12x = 60$

$\Rightarrow x = 5$

Sub (I)

$r^2 = 5^2 + 6.25$

$= 25 + 6.25$

$= 31.25$

$\Rightarrow r = \sqrt{31.25}$

$= \sqrt{\frac{\cancel{3125}\ 125}{\cancel{100}\ 4}}$

$= \frac{\sqrt{5 \times 5 \times 5}}{\sqrt{2 \times 2}}$

$= \frac{5\sqrt{5}}{2}$ cm