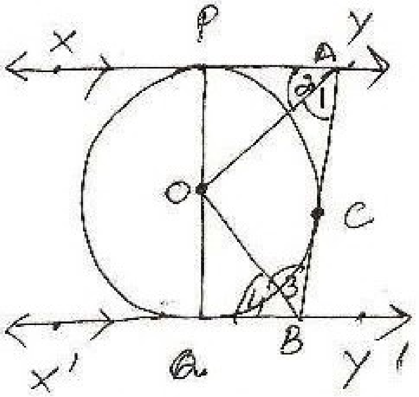
(9)



To Prove $\angle AOB = 90^\circ$

Proof

$\angle 1 = \angle 2$

$\angle 3 = \angle 4$

[tangents from an external point are equally inclined to the line join. centre of ⊙ to external point]

$XY \parallel X'Y'$

$\angle PAB + \angle QBA = 180^\circ$ (co interior angles)

$\angle 1 + \angle 2 + \angle 3 + \angle 4 = 180$

$\angle 1 + \angle 1 + \angle 3 + \angle 3 = 180^\circ$ $\left(\because \begin{array}{l}\angle 1 = \angle 2 \\ \angle 3 = \angle 4\end{array}\right)$

$2(\angle 1 + \angle 3) = 180$

$\Rightarrow \angle 1 + \angle 3 = 90^\circ$

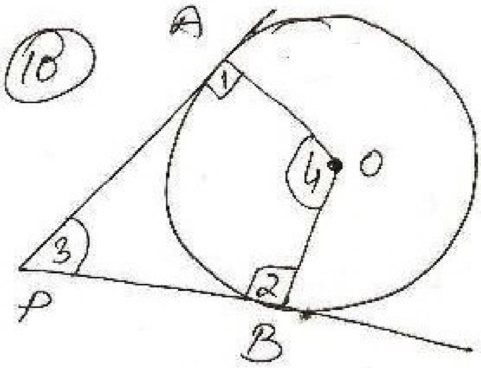
adding $\angle AOB$ on both sides

$\angle 1 + \angle 3 + \angle AOB = 90^\circ + \angle AOB$

$\Rightarrow \angle AOB = 180 - 90$ (angle sum prop. of $\triangle$)

$= 90^\circ$

(10)



To Prove

$\angle APB$ $\angle AOB = 180^\circ$

Proof

$\angle 1 = \angle 2 = 90^\circ$

In $\square$ PBOA

$\angle 1 + \angle 2 + \angle 3 + \angle 4 = 360^\circ$ [angle sum prop. (of $\square$)]

$90^\circ + 90^\circ + \angle 3 + \angle 4 = 360$

$\Rightarrow \angle 3 + \angle 4 = 360 - 180^\circ$

$\Rightarrow \angle APB + \angle AOB = 180^\circ$