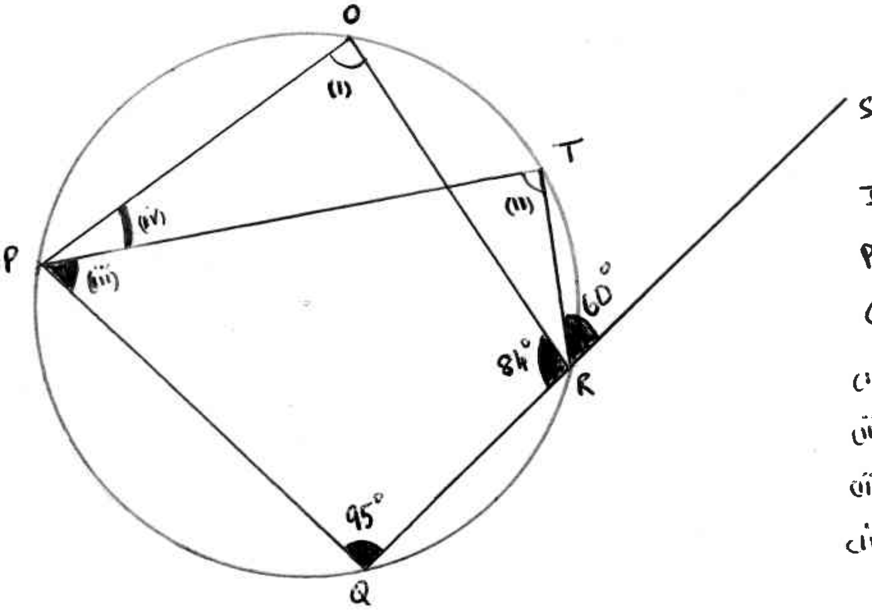
Form 5 CXC St. George's January 1995 MR. DAYLE JOGIE Circle Geometry



In the figure, QRS is a straight line, $P\hat{Q}R = 95°$, $O\hat{R}Q = 84°$, $T\hat{R}S = 60°$.

Calculate, giving reasons:

(i) $P\hat{O}R$

(ii) $P\hat{T}R$

(iii) $T\hat{P}Q$

(iv) $O\hat{P}T$

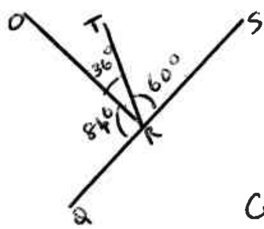
(i) PORQ is a cyclic quadrilateral.

Angles $P\hat{O}R$ and $P\hat{Q}R$ are opposite. Thus, $P\hat{O}R = 180° - P\hat{Q}R$ [Opposite angles of cyclic quadrilateral are supplementary]

$P\hat{O}R = 180° - 95° = 85°$

(ii) $P\hat{O}R = P\hat{T}R = 85°$ [Angles in same segment standing on chord PR are equal].

(iii)



$T\hat{R}O = 180° - [84° + 60°] = 180° - 144° = 36°$.

So $T\hat{R}Q = 84° + 36° = 120°$.

Consider cyclic quadrilateral PTRQ. Then, since $T\hat{P}Q$ is opposite to $T\hat{R}Q$ in this quadrilateral,

$T\hat{P}Q = 180° - 120° = 60°$.

(iv) $O\hat{P}T = O\hat{R}T = 36°$ [Angles in same segment standing on chord OT are equal]

Alternatively, consider cyclic quadrilateral OPQR with $O\hat{P}Q$ opposite to $O\hat{R}Q$.

Then $O\hat{P}Q = 180° - O\hat{R}Q = 180° - 84° = 96°$

But $O\hat{P}T + T\hat{P}Q = O\hat{P}Q$.

Thus, $O\hat{P}T = O\hat{P}Q - T\hat{P}Q = 96° - 60° = 36°$.

Summarizing then: $P\hat{O}R = 85°$; $P\hat{T}R = 85°$; $T\hat{P}Q = 60°$; $O\hat{P}T = 36°$.