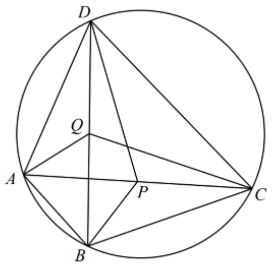
Example 37 : As shown in Figure 1 , P and Q *are the midpoints of* the diagonals AC and BD *of the* inscribed quadrilateral $ABCD$. If $\angle BPA = \angle DPA$, prove: $\angle AQB = \angle CQB$. (2011 National High School Mathematics Competition)



Proof: Suppose $\dfrac{\dfrac{(B+D)/2-C}{D-B}}{\dfrac{D-B}{(B+D)/2-A}}=t_1$, $\dfrac{\dfrac{(A+C)/2-B}{C-A}}{\dfrac{C-A}{(A+C)/2-D}}=t_2$, $\dfrac{\dfrac{D-A}{D-B}}{\dfrac{C-A}{C-B}}=t_3$, then

$-3-4t_1-4t_2+16t_1t_2+16t_3-16t_3^{\,2}$.