



Maths
Leaving Certificate
Ordinary Level

Past Exam Questions
Marking Scheme on
Geometry Proofs

Q6 (b) 2013 Paper 2

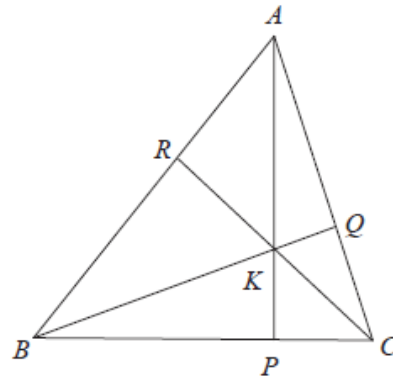
OR

Question 6B

In the acute-angled triangle ABC
 $AP \perp BC$, $BQ \perp AC$ and $CR \perp AB$.

Prove that

$$|\angle ABQ| + |\angle BCR| + |\angle CAP| = 90^\circ.$$



In the triangle APC ,

$$|\angle CAP| + |\angle PCA| = 90^\circ \quad \dots |\angle APC| = 90^\circ.$$

In the triangle QBC ,

$$|\angle QBC| + |\angle BCQ| = 90^\circ \quad \dots |\angle CQB| = 90^\circ.$$

Hence, $|\angle CAP| = |\angle QBC|$.

In the triangle RBC ,

$$|\angle RBC| + |\angle BCR| = 90^\circ \quad \dots |\angle CRB| = 90^\circ$$

$$\Rightarrow |\angle RBQ| + |\angle QBC| + |\angle BCR| = 90^\circ$$

$$\Rightarrow |\angle ABQ| + |\angle CAP| + |\angle BCR| = 90^\circ.$$

Or

In $\triangle RBK$, $|\angle RBK| + |\angle BKR| + 90^\circ = 180^\circ$ Angle sum in a triangle is 180°

In $\triangle PCK$, $|\angle PCK| + |\angle CKP| + 90^\circ = 180^\circ$.

In $\triangle QAK$, $|\angle QAK| + |\angle AKQ| + 90^\circ = 180^\circ$.

Adding: $|\angle RBK| + |\angle BKR| + |\angle PCK| + |\angle CKP| + |\angle QAK| + |\angle AKQ| + 270^\circ = 540^\circ$

$$\Rightarrow |\angle RBK| + |\angle PCK| + |\angle QAK| = 540^\circ - 270^\circ - (|\angle BKR| + |\angle CKP| + |\angle AKQ|)$$

$$\Rightarrow |\angle RBK| + |\angle PCK| + |\angle QAK| = 270^\circ - (180^\circ) = 90^\circ$$

$$\Rightarrow |\angle ABQ| + |\angle BCR| + |\angle CAP| = 90^\circ.$$

Q6 (b) 2012 paper 2

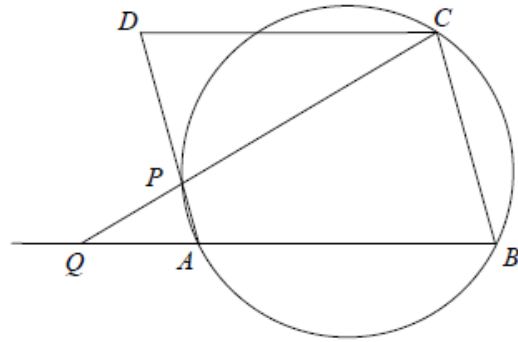
Question 6B

$ABCD$ is a parallelogram.

The points A , B and C lie on the circle which cuts $[AD]$ at P .

The line CP meets the line BA at Q .

Prove that $|CD| = |CP|$.



$$|\angle ABC| = |\angle CDP|, \text{ opposite angles in a parallelogram}$$

$$|\angle ABC| + |\angle CPA| = 180^\circ, \text{ opposite angles in cyclic quadrilateral}$$

$$|\angle DPC| + |\angle CPA| = 180^\circ$$

$$\text{Hence, } |\angle ABC| = |\angle DPC|$$

$$\text{Hence, } |\angle CDP| = |\angle DPC| \Rightarrow \text{isosceles triangle or } |CD| = |CP|$$