**IGCSE Further Maths Geometric Proofs Exercise**

**[Test Your Understanding]**

Triangle $ABC$ is isosceles with $AC=BC$.

Triangle $CDE$ is isosceles with $CD=CE$.

$ACD$ and $DEF$ are straight lines.

1. Prove that angle $DCE=2x$
2. Prove that $DF$ is perpendicular to $AB$.

**Question 1 [Set 4 Paper 1 Q4]**

$ABC$ is a right-angled triangle. Angle $ACB=x$. Angle $BAD=90-2x$.

Prove that $ACD$ is an isosceles triangle.

**Question 2 [Set 4 Paper 1 Q9]**

$ABCD$ is a quadrilateral.

Prove that $x=y$.

**Question 3 [Set 4 Paper 2 Q3]**



$AB$ is parallel to $CD$.

Is $PQ$ parallel to $SR$? You **must** show your working.

**Question 4 [Set 4 Paper 2 Q13]**

$PQRS$ is a cyclic quadrilateral. $QS=QR$. $VST$ is a tangent to the circle.

Work out the value of $x$. You must show your working.

**Question 5 [Specimen Paper 1 Q15]**

$A$, $B$, $C$ and $D$ are points on the circumference of a circle such that $BD$ is parallel to the tangent to the circle at $A$.

Prove that $AC$ bisects angle $BCD$. Give reasons at each stage of your working.

**Question 6 [Specimen Paper 2 Q7]**

Prove that $AB$ is parallel to $DC$.

**Question 7 [June 2012 Paper 2 Q5]**

$ABC$ is a triangle. $P$ is a point on $AB$ such that $AP=PC=BC$. Angle $BAC=x$.

1. Prove that angle $ABC=2x$.
2. You are also given that $AB=AC$. Work out the value of $x$.