GCSE HIGHER · REVISION MAT 5

Congruence and geometric proof

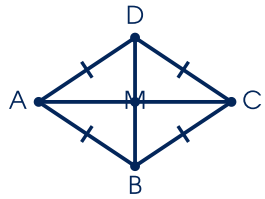
1 Two right-angled triangles have hypotenuse 15 cm and a side of 9 cm.

Which condition shows they are congruent?

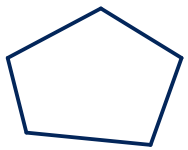
2 Write down what SAS stands for.

3 Explain why two squares with equal diagonals are congruent.

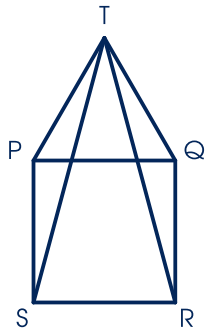
4 Prove that the diagonals of a rhombus are perpendicular.



5 Prove that the interior angles of a pentagon add up to 540°.

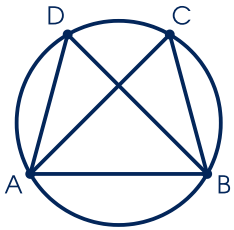


6 PQRS is a square. PQT is an equilateral triangle outside the square.



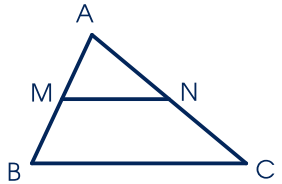
Prove that triangle STR is isosceles.

7 Prove that angles in the same segment are equal.



8 M and N are the midpoints of AB and AC in triangle ABC.

Use vectors to prove that MN is parallel to BC and half its length.



ANSWERS · REVISION MAT 5

Congruence and geometric proof

1 **RHS**

2 **Side, Angle, Side**
(the angle between the two sides)

3 **The diagonal fixes the side length, so the squares are identical.**

4 Triangles ABM and ADM are congruent (SSS)

Angles AMB and AMD are equal and add to 180°

Each is 90°

5 Diagonals from one vertex make 3 triangles

3 × 180 = 540°

6 SP = RQ, PT = QT

Angle SPT = angle RQT = 150°

Triangles SPT and RQT congruent (SAS)

ST = RT

7 Both are half of the same angle at the centre.

So they are equal.

8 AB = **b**, AC = **c**

$\text{MN} = \frac{1}{2}\mathbf{c} - \frac{1}{2}\mathbf{b} = \frac{1}{2}(\mathbf{c} - \mathbf{b})$

$\text{MN} = \frac{1}{2}\text{BC}$