GCSE HIGHER · REVISION MAT 2

Congruence and geometric proof

1 Two right-angled triangles both have hypotenuse 10 cm and a side of 6 cm.

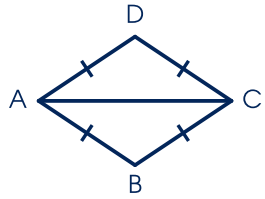
Which condition shows they are congruent?

2 Two triangles each have angles of 50° and 60° with an 8 cm side between them.

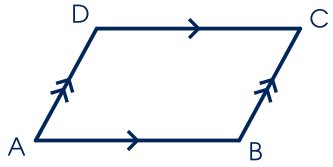
Which condition shows they are congruent?

3 Explain why two sides and a non-included angle (SSA) do not always prove congruence.

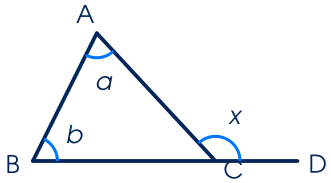
4 Prove that a diagonal of a rhombus bisects the angles it passes through.



5 Prove that opposite angles of a parallelogram are equal.

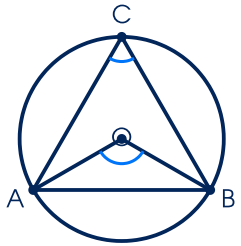


6 Prove that an exterior angle of a triangle equals the sum of the two interior opposite angles.



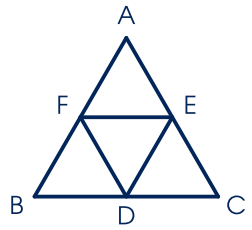
7 O is the centre of a circle. A, B, C are on the circle with O inside triangle ABC.

Prove that angle AOB = 2 × angle ACB.



8 ABC is equilateral. D, E, F are the midpoints of BC, CA, AB.

Prove that triangle DEF is equilateral.



Mr&Mrs MATHS

ANSWERS · REVISION MAT 2

Congruence and geometric proof

1 **RHS**

2 **ASA**

3 **Two different triangles can sometimes be drawn with the same SSA.**

4 In rhombus ABCD, AB = AD and CB = CD, AC common

Triangles ABC and ADC congruent (SSS)

So angle BAC = angle DAC

5 Co-interior angles: A + B = 180° and B + C = 180°

So A = C (and similarly B = D)

6 Exterior $e = 180 - c$

$a + b = 180 - c$

So $e = a + b$

7 Join CO and extend; triangles OAC, OBC isosceles

Exterior angles give $2x$ and $2y$

AOB = $2(x + y)$ = 2 × ACB

8 Triangles AFE, BDF, CED are congruent (SAS: half-sides, 60°)

So FE = DF = ED

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