FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

# G5: Congruent triangles

*Prove congruence and reason with congruence conditions*

20 marks · 25 minutes · Non-calculator

**1)** Explain why "three equal angles" is not a test for congruence.

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**[Question 1: 2 marks]**

**2)** *ABCD* is a kite with *AB* = *CB* and *AD* = *CD*. Prove that triangles *ABD* and *CBD* are congruent.

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**[Question 2: 3 marks]**

**3)** Explain why two sides and a non-included angle are not always enough to prove congruence.

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**[Question 3: 2 marks]**

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**4)** *ABCD* is a square with diagonal *AC*. Prove that triangles *ABC* and *CDA* are congruent.

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**[Question 4: 2 marks]**

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**5)** Triangle *ABC* has *AB* = *AC*. *M* is the midpoint of *BC*. Prove that triangles *ABM* and *ACM* are congruent and hence that *AM* is perpendicular to *BC*.

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**[Question 5: 3 marks]**

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**6)** *ABCD* is a parallelogram. Prove that diagonal *BD* splits it into two congruent triangles.

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**[Question 6: 3 marks]**

**7)** Explain what the RHS condition is and when it can be used.

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**[Question 7: 2 marks]**

**8)** Two triangles have two equal angles and one equal side. Explain why they are only certain to be congruent if the equal sides correspond.

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**[Question 8: 2 marks]**

**9)** Explain why congruent shapes have equal areas.

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**[Question 9: 1 marks]**

**End of paper – 20 marks in total**

# Answers and brief mark scheme

| Q | Answer | Method / notes |
|---|---|---|
| 1 | Explanation | Triangles can be different sizes but similar (C2). |
| 2 | Proof | $AB = CB$, $AD = CD$ (M1); $BD$ common (M1); SSS (C1). |
| 3 | Explanation | Two different triangles can be drawn (ambiguous case) (C2). |
| 4 | Proof | $AB = CD$, $BC = DA$, $AC$ common (M1); SSS (C1). |
| 5 | Proof | SSS: $AB = AC$, $BM = CM$, $AM$ common (M1); C1; angles at $M$ equal and sum to 180°, so 90° (C1). |
| 6 | Proof | $AB = CD$, $AD = CB$ (M1); $BD$ common (M1); SSS (C1). |
| 7 | Explanation | Right angle, hypotenuse, one other side (C1); right-angled triangles only (C1). |
| 8 | Explanation | Different sides could be opposite the equal angles (C2). |
| 9 | Explanation | They fit exactly on top of each other (C1). |