FOUNDATION & HIGHER

SAME AT BOTH TIERS

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

G6: Geometric proof

Use angle facts, congruence and Pythagoras to prove results

20 marks · 25 minutes · Non-calculator

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

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[Question 1: 3 marks]

2) Use congruent triangles to prove that the base angles of an isosceles triangle are equal.

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[Question 2: 3 marks]

3) Show that a triangle with sides 9 cm, 12 cm and 15 cm is right-angled.

[Question 3: 2 marks]

4) Prove that the opposite angles of a parallelogram are equal.

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[Question 4: 2 marks]

5) Prove that the angles in a quadrilateral add up to 360°.

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[Question 5: 2 marks]

6) Explain why Pythagoras' theorem only works for right-angled triangles.

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[Question 6: 1 marks]

7) An isosceles triangle has sides 10 cm, 10 cm and 12 cm. Show that its height is 8 cm.

[Question 7: 2 marks]

8) Prove that the diagonals of a rectangle are equal in length.

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[Question 8: 3 marks]

9) Kim says a triangle with sides 5, 6 and 7 is right-angled. Show that she is wrong.

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[Question 9: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Proof	$a + b + c = 180$ (M1); $c + e = 180$ (M1); $e = a + b$ (C1).
2	Proof	Draw line from apex to midpoint of base (M1); SSS (M1); corresponding angles equal (C1).
3	Shown	$81 + 144 = 225$ (M1); $= 15^2$ (C1).
4	Proof	Co-interior angles: $A + B = 180$, $B + C = 180$ (M1); C1.
5	Proof	Diagonal makes two triangles (M1); 2×180 (C1).
6	Explanation	It relies on the right angle (C1).
7	Shown	Half base 6 (M1); $\sqrt{100 - 36}$ (C1).
8	Proof	Triangles ABC and DCB (M1); SAS with right angles (M1); so $AC = DB$ (C1).
9	Shown	$25 + 36 = 61 \neq 49$ (M1); C1.