FOUNDATION & HIGHER

SAME AT BOTH TIERS

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

G6: Geometric reasoning

Use angle facts, Pythagoras and properties of shapes to find and prove results

20 marks · 25 minutes · Non-calculator

1) A right-angled triangle has shorter sides of 6 cm and 8 cm. Find the length of its hypotenuse.

..... cm

[Question 1: 2 marks]

2) A right-angled triangle has a hypotenuse of 13 cm and one side of 5 cm. Find the length of the other side.

..... cm

[Question 2: 2 marks]

3) An isosceles triangle has an angle of $2x°$ between its two equal sides. Write an expression, in terms of x, for each of the other angles.

..... °

[Question 3: 2 marks]

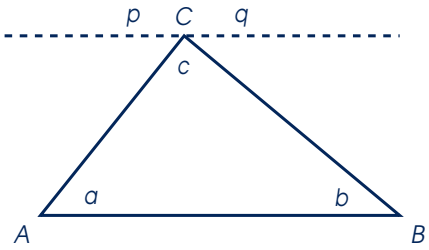
4) A triangle has sides of 7 cm, 24 cm and 25 cm. Is it right-angled? Show how you decide.

.....

[Question 4: 2 marks]

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5) Here is a proof that the angles in triangle *ABC* add up to 180°. The dashed line through *C* is parallel to *AB*.



Give the reason for each step.

(a) $p = a$ because

.....

(1)

(b) $q = b$ because

.....

(1)

(c) $p + c + q = 180°$ because

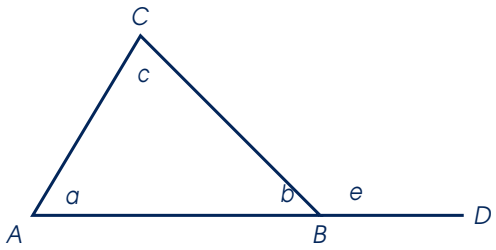
.....

(1)

[Question 5: 3 marks]

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6) *ABD* is a straight line. Show that the exterior angle *e* is equal to $a + c$.



(a) Explain why $b + e = 180°$

.....

(1)

(b) Explain why $a + b + c = 180°$

.....

(1)

(c) Hence show that $e = a + c$

.....

(1)

[Question 6: 3 marks]

7) *ABCD* is a parallelogram. Use co-interior angles to show that angle *A* = angle *C*.

.....

.....

.....

[Question 7: 2 marks]

8) Find the length of the diagonal of a rectangle that measures 5 cm by 12 cm.

..... cm

[Question 8: 2 marks]

9) An isosceles triangle has a base of 10 cm and two equal sides of 13 cm. Find its perpendicular height.

..... cm

[Question 9: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	10	$6^2 + 8^2 = 100$ (M1); A1.
2	12	$169 - 25 = 144$ (M1); A1.
3	$90 - x$	$180 - 2x$ (M1); $\div 2$ (A1).
4	Yes	$7^2 + 24^2 = 625 = 25^2$ (M1); yes (A1).
5	(a) alternate angles (b) alternate angles (c) angles on a straight line	B1 each.
6	(a) angles on a straight line (b) angles in a triangle (c) both equal $180 - b$	B1 each.
7	Shown	$A + B = 180$ and $B + C = 180$ (co-interior) (M1); so $A = C$ (A1).
8	13	$25 + 144$ (M1); A1.
9	12	Half the base is 5 (M1); $\sqrt{169 - 25}$ (A1).