



Instructions: No answer bank: show your working for the shape maths. Number the steps in order, answer the case study questions, explain the key terms, then write full-sentence answers and plan the extended answer.

1. Shape maths (show your working)

Question	Working and answer
Angles $2x$, $3x$ and $4x$. Find x .	
Isosceles: base angles 52° each. Top angle?	
Right-angled triangle with one angle 27° . The other acute angle?	
Sides 6 cm and 9 cm. The longest the third side can be (whole cm)?	
Exterior angle at one vertex when interior angle is 112°	

Did you know?

- An exterior angle of a triangle equals the sum of the two opposite interior angles.
- The longest side is always opposite the largest angle.
- Every triangle has three heights, one for each side used as the base.
- Triangles are used in mesh models for 3D video games.

Background

A triangle is a flat shape with three straight sides and three angles. We can sort triangles by their sides. An equilateral triangle has all three sides equal. An isosceles triangle has two equal sides. A scalene triangle has no equal sides. Small dashes on sides show which ones are equal.

2. Steps in order

Number the steps 1 to 5 (1 = first).

1	Name by sides: Equilateral, isosceles or scalene
2	Check the sum: Make sure the angles add up to 180°
3	Look at angles: Find the largest angle
4	Look at sides: Check for equal-side marks
5	Name by angles: Acute, right or obtuse-angled

4. Key terms

Key term	What does it mean? Give an example.
Equilateral	
Isosceles	
Scalene	
Right-angled triangle	
Base	

3. Case study

Tayo builds a triangle frame from three sticks: 12 cm, 7 cm and 4 cm. It will not close. He swaps the 4 cm stick for a 9 cm stick and it works.

Case study: Tayo's stick triangle

- Why did 12, 7 and 4 cm fail?

- Classify the 12, 7, 9 cm triangle by its sides.

- Give a whole-number range for the third stick with 12 cm and 7 cm.

5. Think it through

- Explain why an exterior angle equals the two opposite interior angles added.

- Explain why a triangle can have at most one obtuse angle.

6. Longer answers (full sentences)

1. Classify a triangle with angles 90° , 45° and 45° in two ways.

2. Explain the triangle inequality with your own example.

3. Why are the base angles of an isosceles triangle equal?

4. Explain in your own words: Explain why 3 cm, 4 cm and 9 cm cannot make a triangle.

7. Extended answer

Extended answer: 'Triangles are the most important shape in building.' How far do you agree?

Plan: introduction · point for (example) · point against (example) · conclusion with your judgement.
