

Construction – triangles from sides, bisecting lines and angles

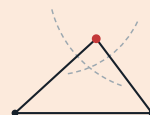
MODULE 6 · 2D AND 3D SHAPE, ANGLES, SYMMETRY SHAPE & SPACE

A compass and ruler can build shapes **exactly** — no eyeballing. To construct a triangle from three sides: draw the longest side, then swing an arc of each other side from each end; the arcs cross at the third vertex.

→ **Triangle 5 cm / 7 cm / 6 cm**: draw 7 cm baseline → arc 5 cm from one end → arc 6 cm from the other → join the crossing to both ends.

→ **Bisect a line**: from each end swing two arcs of equal radius (more than half the line); the line between the crossings cuts the original line exactly in half.

→ **Bisect an angle**: from the vertex swing one arc cutting both rays; from each cut swing equal arcs; the line through the vertex and the new crossing splits the angle.



- 1 **Baseline**
draw the longest side
- 2 **Arcs**
swing from each end
- 3 **Join**
lines to the crossing

CONSTRUCT A TRIANGLE WITH SIDES 6 CM, 8 CM, 10 CM

- 1 Draw the **longest side** (10 cm) with a ruler. Mark the two ends **A** and **B**.
- 2 Set your compass to **6 cm**. Plant the point on **A**. Swing an arc above the line.
- 3 Set your compass to **8 cm**. Plant the point on **B**. Swing an arc above the line — it crosses the first arc.
- 4 The crossing point is the third vertex **C**. Join **A → C** and **B → C**. The triangle is exact.

HOW TO ANSWER TODAY

- **Triangle facts.** Equilateral = all 3 sides equal. Isosceles = 2 equal. Scalene = all different. A triangle works only if the two shorter sides **ADD UP TO MORE** than the longest.
5, 5, 7 → isosceles · 2, 3, 9 → impossible ($2 + 3 = 5 < 9$)
- **Name a 2D shape.** Count sides, check which are equal, count right angles, check parallel pairs. Then name it.
4 equal sides, 0 right angles → rhombus · 4 sides, 1 pair parallel → trapezium

WARM-UP

- 1 Saoirse is folding a square raffle ticket for the 5th class Christmas hamper draw. She folds the **90°** corner of the ticket exactly in half along the diagonal. What is the size of each half angle?
An angle of 90° is bisected (split exactly in half).
What is each half angle?
- 2 Mr Ó Briain is painting markings on the yard for a mini athletics event with 5th class. One of the markings is a 2D shape with **4** sides and exactly **1** pair of parallel sides. Which 2D shape is he painting?
Which 2D shape has these properties: 4 sides with exactly 1 pair of parallel sides?