

Angles and bearings

Topic cliff notes / objectives, key ideas and examples

Learning objectives

- Use angle facts to calculate missing angles.
- Measure and interpret three-digit bearings.

Key ideas

- Use straight-line, full-turn and triangle angle totals.

straight line: 180° , point: 360° , triangle: 180°

- For parallel lines, corresponding and alternate angles are equal; co-interior angles are supplementary.
- The interior angle sum depends on the number of polygon sides.

$$S = (n - 2)180^\circ$$

- For a regular polygon, exterior angles are equal.

$$\text{each exterior angle} = \frac{360^\circ}{n}$$

- Measure bearings clockwise from north at the starting point. Write three digits.

Worked example

Find the return bearing for a journey with the given outward bearing.

$$\text{outward bearing} = 065^\circ$$

The return direction differs by half a turn.

$$65^\circ + 180^\circ = 245^\circ$$

Answer

$$245^\circ$$

Quick example

Find each exterior angle of a regular octagon.

$$\frac{360^\circ}{8} = 45^\circ$$

Answer

$$45^\circ$$

Watch out

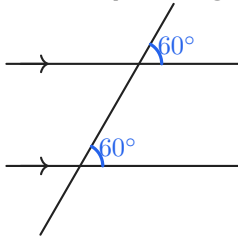
Bearings start at north at the starting point. For a return bearing, add or subtract half a turn as appropriate.



Visual guide: parallel lines and bearings

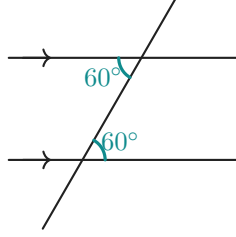
Parallel lines. The arrow marks show that the two horizontal lines are parallel. The sloping line is a transversal. Match the positions of the coloured angles before choosing an angle fact.

Corresponding



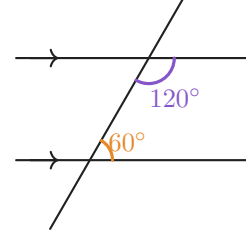
Same position at each crossing:
the angles are equal.

Alternate



Inside the parallel lines, on
opposite sides of the
transversal: equal.

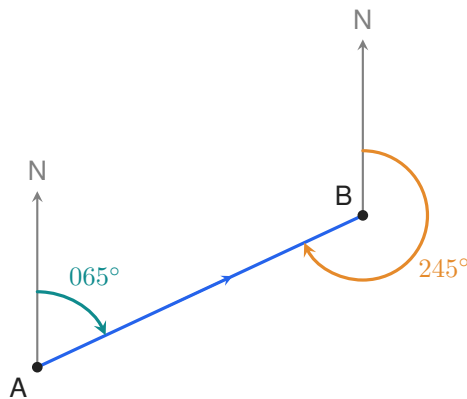
Co-interior



Inside, on the same side: the
angles add to 180° .

A bearing starts at north

At **A**, turn clockwise from north to face B. The bearing of B from A is 065° . At **B**, start from B's north line to find the return bearing.



$$065^\circ + 180^\circ = 245^\circ$$

The north lines are parallel. A return bearing differs by 180° : add 180° if the result is below 360° ; otherwise subtract 180° . Write all bearings with three digits, including leading zeros.

