

Exercise walk-through

4.1.2

Angle Reasoning

AQA · GCSE · Mathematics

67. Angle facts and polygon reasoning · Foundation

Angle facts and polygon reasoning · Foundation

If a straight-line angle is 68° , its neighbour is 112° ; its vertically opposite angle is 68° . A parallel-line corresponding angle is also 68° , with the reason named. Drawing a line through a triangle vertex parallel to the opposite side transfers its two base angles by alternate-angle equality; the three angles then form a straight line and sum to 180° . A pentagon splits into three triangles, giving 540° . A regular hexagon has total 720° , each interior angle 120° and each exterior turn 60° .

86. Geometric reasoning on coordinate axes · Foundation

Geometric reasoning on coordinate axes · Foundation

For $A=(1,2)$, $B=(5,2)$, $C=(5,5)$, $D=(1,5)$, $AB=4$ and $BC=3$. AB is horizontal, BC vertical, so they are perpendicular; opposite sides have matching directions and lengths, establishing a rectangle. Diagonal AC has length $\sqrt{(4^2+3^2)}=5$. Its midpoint is $((1+5)/2, (2+5)/2)=(3,3.5)$. Diagonal BD has the same midpoint, confirming that the diagonals bisect each other. A translation by $(2,-1)$ sends A to $(3,1)$ and C to $(7,4)$, preserving the diagonal length. A square would additionally need adjacent side lengths equal; these lengths 4 and 3 exclude it.

183. Reasoning and check

Reasoning and check

Angle ACB is 90 degrees because an angle in a semicircle is a right angle. Triangle angles give $\angle ABC = 180 - 90 - 32 = 58$ degrees. By the alternate segment theorem, the angle between chord AC and the appropriate tangent ray equals angle ABC, 58 degrees. The other angle on the tangent's straight line is 122 degrees. Naming the acute angle selects 58; the drawing's apparent scale is unnecessary. The diameter and tangent facts are required hypotheses.

Exercises 2.1·2.3

2.1 (Foundation) Find the straight-line neighbour of 68° .

2.2 (Foundation) Find the interior-angle sum of a pentagon.

2.3 (Foundation) Find one exterior angle of a regular hexagon.

3 Exam-style questions

Exercises 2.1·2.3

2.1 (Foundation) Find the straight-line neighbour of 68° .

2.1 $180-68=112^\circ$.

2.2 (Foundation) Find the interior-angle sum of a pentagon.

2.2 $(5-2)\times 180=540^\circ$.

2.3 (Foundation) Find one exterior angle of a regular hexagon.

3 Exam-style questions

2.3 $360/6=60^\circ$.

Exercise 3.1

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: Corresponding angles are equal even when the crossed lines are not parallel.

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3.1 False. A horizontal transversal can meet one line at 60° and a second at 70° . Corresponding angles differ; parallelism is required for the equality theorem.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.