

Angle facts and parallel lines

Pearson Edexcel GCSE Mathematics 1MA1 • L025
Foundation and Higher • 60 minutes • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

Calculate missing angles and justify each step using named angle facts and marked parallel lines.

Non-calculator reasoning. Optional check: $95+85=180$. A calculator cannot identify an angle relationship.

Follow the task-specific calculator guidance below. Write on the lines or replace them with typed answers. Attempt before reading intentional practice feedback.

Connect & Check

Vertex: meeting point of rays. Transversal: line crossing two lines. Corresponding: matching position. Alternate: opposite sides of a transversal between the lines. Supplementary: sum of 180° .

R1

Find $180-65$.

R2

Find $360-120-90$.

R3

Solve $2x+40=180$.

Share | In pairs, predict the first step for this problem: A straight angle is half a turn, 180° ; a full turn is 360° . At intersecting lines, opposite angles are equal because each supplements the same adjacent angle. With parallel lines, Compare your reasons before using the worked model.

Present through worked examples

A straight angle is half a turn, 180° ; a full turn is 360° . At intersecting lines, opposite angles are equal because each supplements the same adjacent angle. With parallel lines, corresponding and alternate angles are equal; co-interior angles sum to 180° . A diagram that merely looks parallel is insufficient.

D1

Model: adjacent angles on a straight line are 42° and x° , so $x=138^\circ$. Now use 73° and y° .

D2

Model: angles at a point are 90° , 140° and x° , so $x=130^\circ$. Now use 80° , 125° and y° .

D3

Model: one angle at intersecting lines is 62° ; its opposite is 62° . Now one is 117° . Find its opposite and an adjacent angle.

D4

Model: alternate angles on parallel lines are equal, so 54° matches 54° . Now an alternate pair is $(3x+10)^\circ$ and 70° . Find x .

Apply with less support

Mark known angles and parallel arrows. Identify a relationship before calculating. Write an equality or sum, solve, then check the angle type. Use the diagram sheet to trace the relevant rays.

A1

For a given angle of 48° on parallel lines, find a corresponding, alternate and co-interior partner.

A2

A co-interior pair on parallel lines is $(2x+20)^\circ$ and $(x+10)^\circ$. Find x and both angles.

A3

Two straight parallel rails meet a transversal. One acute angle is 64° . Find an obtuse angle at either crossing and explain.

Optional support: Name each pair first.

Non-calculator reasoning. Optional check: $95+85=180$. A calculator cannot identify an angle relationship.

Apply and extend reasoning

C1

A learner sees two lines that look parallel and copies an alternate angle. Explain why this may fail.

C2

Explain why vertically opposite angles are equal using a shared adjacent angle a° .

Intentional practice feedback — read after attempting

A1: 48° , 48° , 132° .

A2: $x=50$; 120° and 60° .

A3: 116° .

C1: Appearance is not evidence of parallelism. Equality requires parallel lines or another given reason.

C2: Both equal $180-a$, so they are equal.

Correct one response and explain your change. Stretch is available to either tier; temporary support needs do not determine entry tier.

Recall & Review through retrieval

Work without notes. Six retrieval points; this attempt does not establish mastery. Equivalent exact numeric forms are accepted. Where accuracy is requested, also state the requested form in your written work.

Q1 Supplement of 72° , in degrees

Q2 Full turn minus 95° , in degrees

Q3 Opposite angle to 113° , in degrees

Q4 Alternate to 47° on parallels, degrees

Q5 Co-interior partner of 124° , degrees

Q6 Solve $3x+15=180$

Intentional retrieval feedback

Q1 108; Q2 265; Q3 113; Q4 47; Q5 56; Q6 55. Correct and retry tomorrow, then in one week.

Prove independently and improve

P1–P2: five minutes without notes; 4 marks. Your teacher reviews explanations and method marks.
P3 has no mark.

P1

A straight-line pair is 86° and x° . Find x with a reason. [2]

P2

Alternate angles on marked parallel lines are $(4x-5)^\circ$ and 63° . Find x , showing the equation. [2]

P3

Explain one corrected error. Record a fresh question and a date to check it without support.

Teacher feedback: _____

Fresh question and retry date: _____

Delayed independent evidence: _____

Prepare for the next lesson

L026: Triangles and polygons

F1

Tomorrow find the supplement of 127° and explain.

F2

Before L026, a triangle has angles 50° and 60° . Find the third.

Read and prepare

A line through a triangle vertex parallel to the opposite side lets alternate angles transfer onto a straight line. This explains the triangle angle sum of 180° .

Digital workbook: save locally where available; export a JSON backup before closing or moving the file. Restore only this lesson/version. Printing records answers, not mastery. Live browser checks remain pending; use Word/PDF if required.

Optional extension activities

Allow 10–15 minutes for learners who have secured the main practice. Show a method, explain a check and justify your conclusion.

Stretch

Two parallel lines have co-interior angles $3x+10$ and $2x+20$. Find x .

Deep challenge

A student says alternate angles always add to 180° . Correct the claim.

Recall & Review: feedback and extension integration

Lesson L025: Angle facts and parallel lines

Objective: Calculate missing angles and justify each step using named angle facts and marked parallel lines.

Timing for a 60-minute lesson

0-7 Connect & Check; 7-14 Share; 14-25 Present/model; 25-44 Apply route choice/practice; 44-52 independent exam-style check; 52-60 Recall & Review, WWW/EBI and next step.

Recall & Review evidence

At the end of the lesson, solve a fresh question without prompts, explain one check, correct one error and record the next practice step.

What Went Well (WWW)

I selected the correct geometric fact, theorem, formula or transformation and used a clear diagram with appropriate labels and units.

Even Better If (EBI)

I will name the fact or theorem, show the substitution or construction step and check whether the size, direction and units of the result are reasonable.

Integrated stretch and deep challenge

Stretch: Two parallel lines have co-interior angles $3x+10$ and $2x+20$. Find x .

Deep challenge: A student says alternate angles always add to 180° . Correct the claim.

My next-step response