

Inequalities and number lines

Pearson Edexcel GCSE Mathematics 1MA1

L022 • Foundation and Higher

60 minute lesson | learner resources

The goal and the evidence

Connect & Check → Share → Present → Apply → Recall & Review

Solve linear inequalities and represent solution sets on number lines. Explain endpoint inclusion and order reversal.

Explain, apply and check independently.

Starting-point diagnostic

R1–R3 • Attempt without notes

Which is greater: -2 or -5 ?

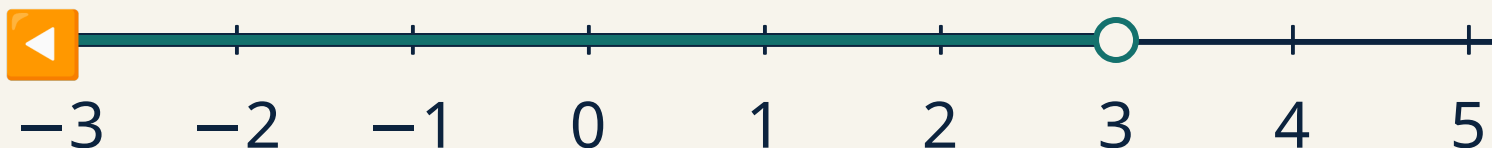
Solve $2x+3=11$.

Calculate $-6 \div -2$.

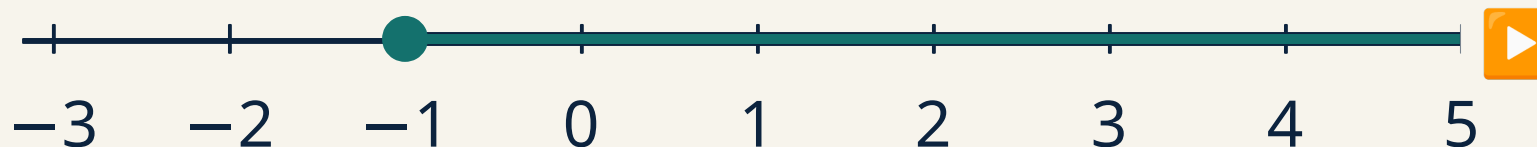
See the endpoint and direction

Read the representation; explain the connection.

$$x < 3$$



$$x \geq -1$$



Worked example and your turn

D1 • Explain each step

Model: $x < 3$ has an open circle at 3 and points left.
Describe $x \geq -1$.

Try the paired problem; check independently.

Worked example and your turn

D2 • Explain each step

Model: $x+4<9$ becomes $x<5$. Now solve $x-3\geq 2$.

Try the paired problem; check independently.

Worked example and your turn

D3 • Explain each step

Model: $2x+1 \leq 9$ gives $2x \leq 8$, so $x \leq 4$. Now solve $3x-2 > 10$.

Try the paired problem; check independently.

Worked example and your turn

D4 • Explain each step

Model: $-2x < 6$ becomes $x > -3$. Now solve $-3x \geq 12$.

Try the paired problem; check independently.

A method you can explain

Name what changes at each step.

Check against the original question.

Diagnostic pause

Choose and explain before moving on.

For $x \leq 3$, is 3 included? A yes, B no.

Use your explanation to decide the next step.

Careful variation

A1 • Show your reasoning

Compare $x < 2$, $x \leq 2$, $x > 2$ and $x \geq 2$ on number lines.
What changes at 2 and in the direction?

Explain your decisions and check the result.

Independent application

A2 • Show your reasoning

Solve $4x+3 \leq 19$, then list positive integer solutions.

Explain your decisions and check the result.

Use the method in context

A3 • Show your reasoning

A £5 fee plus £3 per visit must cost at most £20.
Form an inequality and find the maximum whole visits.

Explain your decisions and check the result.

Intentional practice feedback

Read after attempting A3

$5 + 3v \leq 20$; $v \leq 5$; maximum 5 visits.

Correct one step and explain the change.

A claim to test

C1 • Show your reasoning

A learner divides $-2x \leq 8$ by -2 and writes $x \leq -4$.
Disprove it and give the correct set.

Explain your decisions and check the result.

Deepen the reasoning

C2 • Show your reasoning

List all integers satisfying $-2 < x \leq 3$. Explain why the endpoints differ.

Explain your decisions and check the result.

Retrieval without notes

Q1–Q6 • Numeric answers; units as requested

Q1–Q3

Boundary of $x+4<9$

Boundary of $2x+1\leq 9$

Boundary of $-3x\geq 12$

Q4–Q6

Largest integer with $x<4$

Number of integers with

$-2<x\leq 3$

Maximum visits:

$5+3v\leq 20$

Independent exit evidence

P1 • Without notes • Teacher review

Solve $2x+5<13$ and describe its number-line representation. [2]

Show working and check your answer.

Independent exit evidence

P2 • Without notes • Teacher review

Solve $-4x \leq 12$. Explain the sign change. [2]

Show working and check your answer.

Feedback and next steps

P3 • Completion is not mastery

Explain one error you have corrected.

Set a fresh question and a delayed check.

Before the next lesson

L023: Sequences and nth terms

Complete F1 tomorrow without notes.

Attempt F2 and bring one question.

Optional stretch

Solve $3 - 2x < 11$ and show the solution in words.

Show a method. Explain a check or counterexample.

Optional deep challenge

Why does dividing $-3x \geq 12$ by -3 reverse the sign? Give a numerical check.

Show a method. Explain a check or counterexample.

L022 Recall & Review

Inequalities and number lines



Fresh evidence: prove the objective

Solve a new question without prompts. Explain one check, then correct one error in your working.

Objective: Solve linear inequalities and represent solution sets on number lines. Explain endpoint inclusion and order reversal.

Write the next practice step before you leave. It must test the method again, not simply copy today's example.

Feedback language

Use the full phrases before the abbreviations.

What Went Well (WWW)

I represented the algebraic structure accurately, kept each transformation valid and checked the result by substitution, graph or equivalent reasoning.

Identify the mathematical method, representation, reasoning or check that improved.

Even Better If (EBI)

I will show the missing inverse operation or algebraic step, keep signs and brackets accurate and test the result in the original relationship.

Set one precise next-step action and test it on a fresh question.

Extension route

Choose this route only after the core evidence is secure.

Stretch

Solve $3 - 2x < 11$ and show the solution in words.

Deep challenge

Why does dividing $-3x \geq 12$ by -3 reverse the sign? Give a numerical check.

Explain your reasoning clearly enough that another learner could check it.