

2.2.2 Inequalities

Name: _____ Class: _____ Date: _____

KEY WORDS solution set

<!-- Session 2 native-skill companion -->

Objective

Practise inequalities within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Linear inequalities and number-line solutions · Foundation

Solve a linear inequality using the same balance operations as an equation. Multiplying or dividing by a negative reverses its direction. Use a closed endpoint for $\leq$ or $\geq$ and an open endpoint for $<$ or $>$. Intersect restrictions to find their common permitted inputs.

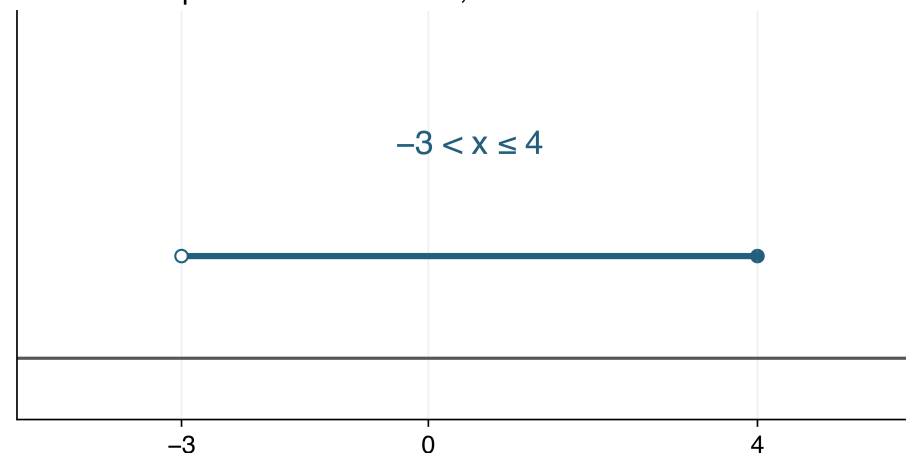
$$3x + 5 \leq 17 \iff x \leq 4$$

$3x+5 \leq 17$ gives $x \leq 4$. For nonnegative whole items, the permitted values are 0,1,2,3,4. Also $-2x < 6$ gives $x > -3$ after division by -2. The combined restriction $-3 < x \leq 4$ has an open circle at -3 and a closed circle at 4. A value $x=5$ fails the original budget because $3 \times 5 + 5 = 20$.

A reversed sign is needed only when multiplying or dividing by a negative, not when adding a negative. Include the physical domain: negative or fractional item counts may be meaningless.

AQA A22 Foundation requires one-variable linear inequalities and number lines. Higher quadratic and two-variable regions are in a separate lesson; avoid replacing the inequality with a single boundary value.

Open means excluded; closed means included



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) Find the largest whole x satisfying $3x+5 \leq 17$.

2.2 (Foundation) Find the boundary value after solving $-2x < 6$.

2.3 (Foundation) How many nonnegative whole-item counts satisfy the budget?

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: Dividing an inequality by a negative number leaves its direction unchanged.

Solutions

2.1 Subtract 5 then divide by 3: $x \leq 4$.

2.2 Divide by -2 and reverse: $x > -3$.

2.3 List 0,1,2,3,4: five counts.

3.1 False. $-2x < 6$ gives $x > -3$ after division by -2 . For example $x=0$ satisfies the original inequality and the reversed-direction result.

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