Inequalities: fact sheet

Planner week 9 · Learn these facts

The symbols

< less than

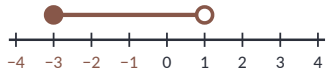
≤ less than or equal to

> greater than

≥ greater than or equal to

The small end points at the smaller number

Open and closed circles



● includes the number (≤ ≥). ○ doesn't (< >)

−3 ≤ p < 1

Integers in a range

−3 < t ≤ 2

−2, −1, 0, 1, 2

List the whole numbers that fit

Check both ends

Solving

7x − 27 < 8

7x < 35

x < 5

Solve like an equation, keep the sign

Answer is a range, not one number

Greatest integer

5y − 7 < 16

y < 4.6

greatest integer: 4

Solve, then pick the whole number

Not 5

Two signs

−2 < x + 3 ≤ 4

− 3 all three parts

−5 < x ≤ 1

Do the same to every part

Then draw it

Comparing numbers

$\frac{5}{8} > \frac{2}{8}$

−2 × −3 = −3 + 9

Work out both sides first

6 = 6

Number lines

●	≤ or ≥ (included)
○	< or > (not included)
Arrow	keeps going

Which sheet do I need?

Inequalities on a number line ▸
circles and arrows, list the integers

Solving inequalities ▸
solve with < or >

Key words

- **Inequality** uses <, >, ≤ or ≥
- **Integer** a whole number
- **Solve** find the range of values
- **Satisfy** make it true

Exam tips

- Read the sign carefully: < or ≤?
- Filled circle = included. Open circle = not included.
- Solve like an equation, but keep the inequality sign.
- Listing integers: check the end numbers.
- Two signs: do the same to all three parts.
- Your answer should still have a sign in it (x < 5).

Inequalities on a number line: fact sheet

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Worked example

QUESTION

Show the inequality $-4 \leq m < 1$ on the number line.

ANSWER



Filled at −4 (included), open at 1 (not included)

Circles at the ends, a line between them.

How to do it

1. Find the two end numbers.
2. ≤ or ≥: filled circle. < or >: open circle.
3. Join the circles with a line.
4. Only one end? Draw an arrow.
5. Listing integers: write every whole number that fits.

Model answer:

● at −4, ○ at 1

Watch out

- Swapping filled and open circles.
- Including an end that isn't allowed.
- Missing 0 from a list.

Solving inequalities: fact sheet

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Worked example

QUESTION

Solve $3x + 5 \geq x + 17$

ANSWER

1. Take x from both sides: $2x + 5 \geq 17$
2. Take 5 from both sides: $2x \geq 12$
3. Divide both sides by 2

$x \geq 6$

Same steps as an equation; keep the sign.

How to do it

1. Treat it like an equation.
2. Do the same to both sides.
3. Keep the inequality sign the same way round.
4. Two signs: do the same to all three parts.
5. Write the answer with the sign.

Model answer:

$x \geq 6$

Watch out

- Writing x = 6.
- Turning the sign round by mistake.
- Only doing it to two of the three parts.