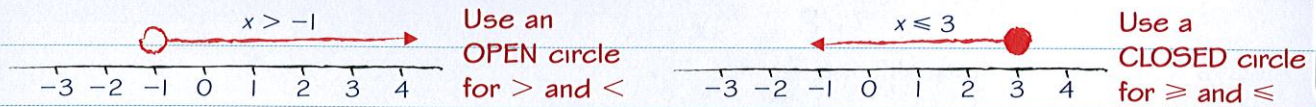


Inequalities

An inequality tells you when one value is bigger or smaller than another value.

You can represent INEQUALITIES on a number line.



The open circle shows that -1 is NOT included. The closed circle shows that 3 IS included.

Solving inequalities

You can solve an inequality in exactly the same way as you solve an equation.

$$x - 3 \leq 12 \quad (+3)$$

$$x \leq 15$$

The solution has the letter on its own on one side of the inequality and a number on the other side.

Golden rule

If you **MULTIPLY** or **DIVIDE** both sides of an inequality by a **NEGATIVE** number you have to **REVERSE** the INEQUALITY sign.

$$6 - 5x > 10 \quad (-6) \quad \text{You have divided by a negative number so you have to reverse the inequality sign.}$$

$$-5x > 4 \quad (\div -5)$$

$$x < -\frac{4}{5}$$

Worked example

grade
B

Solve the inequality $\frac{2x}{3} < 10$

$$\frac{2x}{3} < 10 \quad (\times 3)$$

$$2x < 30 \quad (\div 2)$$

$$x < 15$$

EXAM ALERT!

More than 60% of students got 0 marks on this question.

This is an **inequality** and not an equation.

You don't need to use an '=' sign in your answer.

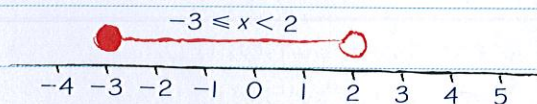
This was a real exam question that caught students out – **be prepared!**

ResultsPlus

Integer solutions

You might need to write down all the integer solutions of an inequality.

INTEGERS are positive or negative whole numbers, including 0.



This shows that x is between -3 and 2 . It can equal -3 but cannot equal 2 .

The integer solutions to this inequality are $-3, -2, -1, 0$ and 1 .

Now try this

1. $-2 < x \leq 1$

x is an integer.

Write down all the possible values of x .
(2 marks)

(a) Multiply each item by the LCM of 2 and 3.

(b) We want the smallest integer value of x that fits your answer to part (a).

2. (a) Solve the inequality

$$\frac{3+x}{2} > \frac{5-2x}{3}$$

(b) x is an integer. Write down the smallest value of x that satisfies $\frac{3+x}{2} > \frac{5-2x}{3}$

(4 marks)

edexcel

grade
A

grade
C