Inequalities questions and answers

9 questions · 5 Core, 4 Extended · 8 non-calculator · worked answers

Name _____ Date _____ Score _____

- Original questions in the style of the Cambridge 0580 papers, each labelled Core or Extended and calculator or non-calculator. Try every question before you look at the answers.
- Worked answers start after the questions. Questions with marks come from our 0580 practice bank (M method, A accuracy, B independent marks).
- Online, with more practice: igcsemathrevision.com/igcse-frontend/0580/inequalities-questions

Core: for everyone (Papers 1 and 3, and Extended Papers 2 and 4)

1. **Core · non-calculator · easy**

Write down every integer n that satisfies $-4 < n \leq 1$.

2. **Core · non-calculator · easy**

On a number line, an open circle is drawn at -1 and a filled circle at 4, with a line joining them. Write down the inequality in x that this shows.

3. **Core · non-calculator · easy · 2 marks**

List the integers x such that $-1 < x \leq 4$.

4. **Core · calculator · easy · 2 marks**

Describe how you would show $x \geq 1.5$ on a number line.

5. **Core · non-calculator · medium · 2 marks**

x is greater than -3 and at most 5.

(a) Write this as a single inequality.

(b) How many integers satisfy it?

Extended: for Papers 2 and 4

6. **Extended · non-calculator · medium**

Solve $5x - 3 > 2x + 9$.

7. **Extended · non-calculator · medium**

(a) Solve $-4 \leq 2x + 6 < 10$.

(b) List the integer values of x that satisfy the inequality.

8. **Extended · non-calculator · hard**

Solve $7 - 3x \geq 19$.

9. **Extended · non-calculator · hard**

The region R is defined by $y \geq 1$, $x + y \leq 6$ and $y \leq 2x$.
Find the point in R with integer coordinates for which $x + 2y$ is greatest.

Answers and worked solutions

Question 1

Answer: $-3, -2, -1, 0, 1$

1. -4 is not included ($<$); 1 is included ($\leq$).

Question 2

Answer: $-1 < x \leq 4$

1. An open circle means the value is not included ($<$); a filled circle means it is included ($\leq$).

Question 3 — 2 marks

Answer: $0, 1, 2, 3, 4$

B2 0, 1, 2, 3, 4 and no others (B1 for four correct values with at most one extra)

Question 4 — 2 marks

Answer: a filled circle at 1.5 with the line going to the right

B1 a filled (solid) circle at 1.5

B1 the line (arrow) going to the right

Question 5 — 2 marks

Answer: (a) $-3 < x \leq 5$ (b) 8

B1 (a) $-3 < x \leq 5$

B1 (b) 8

Question 6

Answer: $x > 4$

1. Subtract $2x$: $3x - 3 > 9$.
2. $3x > 12$, so $x > 4$.

Question 7

Answer: (a) $-5 \leq x < 2$ (b) $-5, -4, -3, -2, -1, 0, 1$

1. (a) Subtract 6: $-10 \leq 2x < 4$. Divide by 2: $-5 \leq x < 2$.
2. (b) $-5, -4, -3, -2, -1, 0, 1$

Question 8

Answer: $x \leq -4$

1. Subtract 7: $-3x \geq 12$.
2. Divide by -3 and reverse the sign: $x \leq -4$.

Question 9

Answer: $(2, 4)$

1. List the integer points: for $y = 4$, only $x = 2$ works ($2x \geq 4$ and $x \leq 2$); $y = 5$ is impossible ($x \geq 2.5$ but $x \leq 1$).
2. Check the best candidates: $(2, 4)$ gives 10, $(3, 3)$ gives 9, $(4, 2)$ gives 8, $(5, 1)$ gives 7.

More inequalities practice with instant marking, notes and common mistakes: igcsemathrevision.com/igcse-frontend/0580/inequalities-questions

Our own original questions, written and checked by IGCSE Math Revision. Independent, not affiliated with Cambridge International.