

Compound Inequalities

Starter

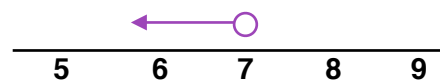
1. (Review of last lesson)

Solve the inequalities, expressing your answer in algebraic and diagrammatic form:

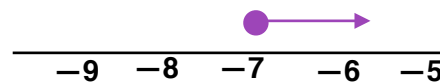
(a) $4x - 3 < 25$

(b) $-3x + 4 \leq 25$

Working: (a) $4x - 3 < 25$
 $4x < 28$
 $x < 7$



(b) $-3x + 4 \leq 25$
 $-3x \leq 21$
 $x \geq -7$



E.g. 1 Solve the inequalities:

(a) $8 < 3x - 10 < 23$

(b) $17 < 6x + 5 \leq 29$

(c) $7 < 15 - 4x < 39$

(d) $x - 19 \leq 5x - 3 < x + 5$

Working: (a) $8 < 3x - 10 < 23$
 $8 < 3x - 10$ $3x - 10 < 23$ *2 separate inequalities*
 $18 < 3x$ $3x < 33$ *solve separately*
 $6 < x$ $x < 11$
Combine into 1 inequality: $6 < x < 11$

(b) $17 < 6x + 5 \leq 29$
 $17 < 6x + 5$ $6x + 5 \leq 29$ *2 separate inequalities*
 $12 < 6x$ $6x \leq 24$ *solve separately*
 $2 < x$ $x \leq 4$
Combine into 1 inequality: $2 < x \leq 4$

(c) $7 < 15 - 4x < 39$
 $7 < 15 - 4x$ $15 - 4x < 39$ *2 separate inequalities*
 $-8 < -4x$ $-4x < 24$ *solve separately*
 $2 > x$ $x > -6$
Combine into 1 inequality: $-6 < x < 2$
N.B. $2 > x > -6$ would be incorrect.

(d) $x - 19 \leq 5x - 3 < x + 5$
 $x - 19 \leq 5x - 3$ $5x - 3 < x + 5$
 $-16 \leq 4x$ $4x < 8$
 $-4 \leq x$ $x < 2$
Combine into 1 inequality: $-4 \leq x < 2$

Video: [Solving inequalities \(two signs\)](#)

[Solutions to Starter and E.g.s](#)

Exercise

9-1 class textbook: p509 M16.1 Qu 2ef, 4-7
 A*-G class textbook: p465 M16.1 Qu 2ef, 4, 6
 9-1 homework book: p171 M16.1 Qu 2, 4bc, 5, 6c, 7
 A*-G homework book: p509 M16.1 Qu 2, 4bc, 6c

[Homework book answers \(only available during a lockdown\)](#)