

Inequality Notation

Starter

- (Review of last lesson)** A quadratic curve of the form $y = x^2 + bx + c$ has its vertex at the point (2, 3). Find its equation.
- (Review of last lesson)** By completing the square, find the coordinates of the vertex of the curve $y = 13 + 8x - 2x^2$ and state whether it is a maximum or minimum.
- (Review of last lesson)**
 - Write $3x^2 - 24x + 11$ in completed square form and state the coordinates of the vertex of the graph $y = 3x^2 - 24x + 11$.
 - State, without any further working, for what values of k is the curve $y = 3x^2 - 24x + 11 + k$ completely above the x -axis.

Notes

Interval notation

$$x \in (a, b) \text{ means } a < x < b$$

$$x \in [a, b] \text{ means } a \leq x \leq b$$

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Set notation

$$x \geq 5 \equiv x \in [5, \infty)$$

$$2 < x < 5 \equiv \{x : 2 < x < 5\}$$

or $2 < x < 5 \equiv \{x : x > 2\} \cap \{x : x < 5\}^*$ where \cap means intersection

$$x < 2, x > 5 \equiv \{x : x < 2, x > 5\}$$

or $x < 2, x > 5 \equiv \{x : x < 2\} \cup \{x : x > 5\}^*$ where \cup means union

N.B. The second version* is the one to use in exams

\emptyset - empty set notation i.e. no solutions

E.g. 1 Copy and complete the table:

Inequality	Set notation	Interval notation
$x > 4$		
	$\{x : x > -3\} \cap \{x : x \leq 8\}$	
$x \leq 6$		
		$x \in (-\infty, 9) \cup [15, \infty)$

Video: [Solving doubles inequalities](#)

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

Exercise

p8 1B Qu 1iac, 2iac, 3iac, 4iac, 5iac

Summary

Interval notation: $x \in (a, b)$ means $a < x < b$
 $x \in [a, b]$ means $a \leq x \leq b$
 $x \in [a, b)$ means $a \leq x < b$
 $x \in (a, b]$ means $a < x \leq b$

Set notation: $x \geq 5 \equiv x \in [5, \infty)$

$2 < x < 5 \equiv \{x : x > 2\} \cap \{x : x < 5\}^*$ where \cap means intersection

$x < 2, x > 5 \equiv \{x : x < 2\} \cup \{x : x > 5\}^*$ where \cup means union