

Categorising quadratic inequalities

Think about all quadratic inequalities and the three properties:

A: The inequality is satisfied by $x = 2$.

B: The solution is given by $a < x < b$ for integers a and b .

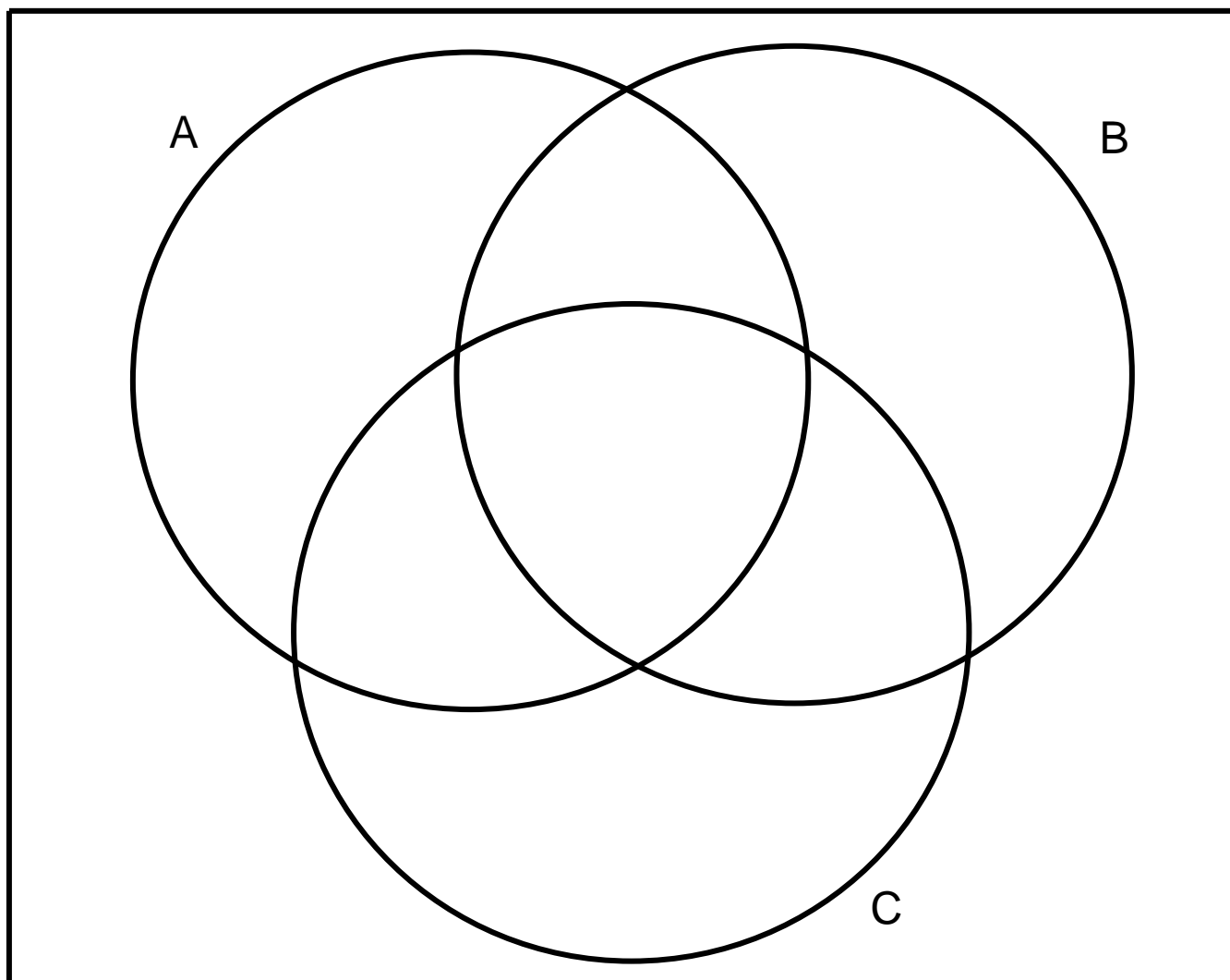
C: The inequality is satisfied by $x = 4$.

The Venn diagram¹ task:

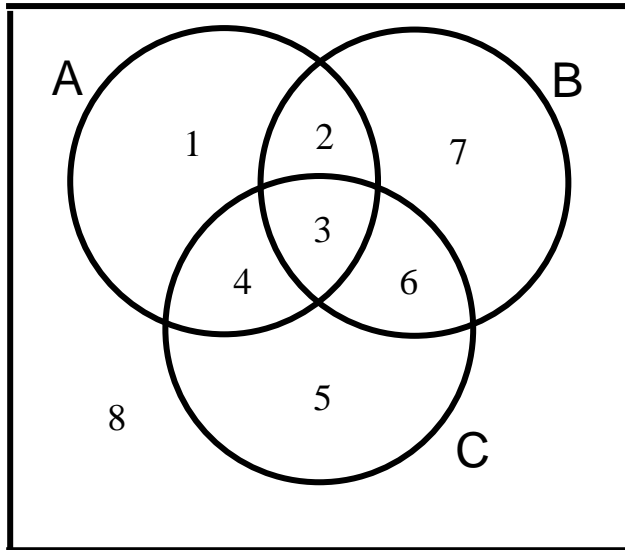
Can you find an inequality which satisfies all three properties A, B and C? If so, write this equation in the central region where the three regions overlap.

How about an inequality which doesn't satisfy any of the requirements? Fill this in the region outside the three regions.

Is it possible to find an example for every region?

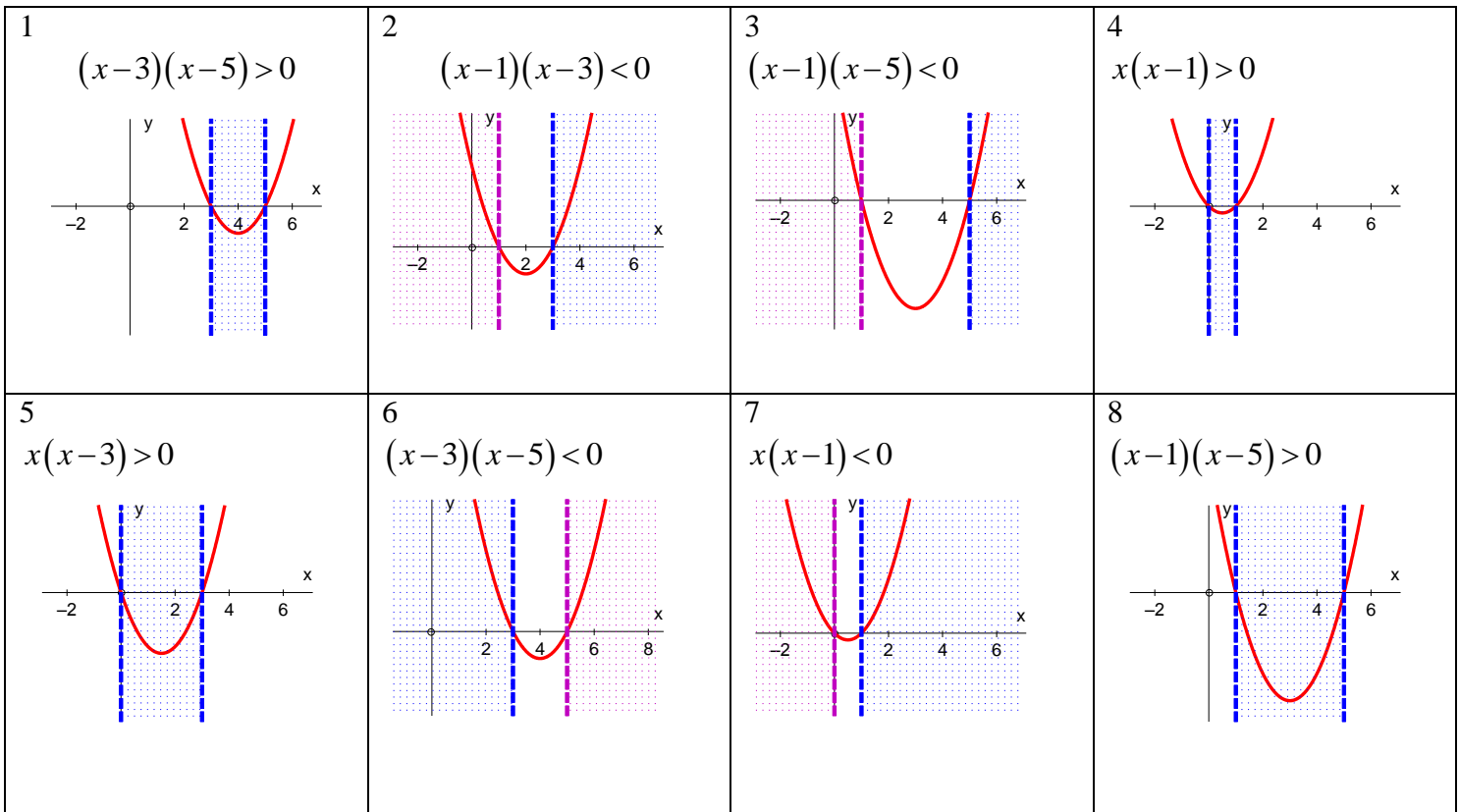


¹ Note that students will be familiar with Venn diagrams for their GCSE mathematics



A possible solution

- A: The inequality is satisfied by $x = 2$.
- B: The solution is given by $a < x < b$ for integers a and b .
- C: The inequality is satisfied by $x = 4$.



Alternatively, ask students to place these eight inequalities in the Venn diagram:

$x^2 > x$	$x^2 + 15 < 8x$	$x^2 + 5 > 6x$	$x^2 + 3 < 4x$
$x^2 < x$	$x^2 + 15 > 8x$	$x^2 + 5 < 6x$	$x^2 > 3x$

This approach provides additional structure to the task to support students.