

Why use this resource?

Students are given three conditions and asked to fill a Venn diagram with quadratic inequalities that will satisfy some, none, or all of the conditions. The inequalities given to solve are varied, meaning that different approaches, sketching graphs, algebra or a combination, may be helpful for different questions. There is also an opportunity to come up with a justification for why some of the regions cannot contain any quadratic inequalities.

Preparation

It may be useful to print a copy of the [Venn Diagram](#) and the [cards](#).

Possible approach

Think - Give students the initial problem and allow them time to understand the three conditions. You may wish to ask them to come up with their own quadratic inequality and see if it satisfies any of the conditions.

Pair - Students work in pairs to solve the inequalities and place them in the different regions of the Venn diagram.

Share - Discuss as a class, how each problem was approached and what methods were used. Did they find any of the inequalities unusual or more difficult? Why are some of the regions of the Venn diagram empty? Is it possible to fill them? Students should be asked to justify their answers to any of these questions.

Key questions

- What approach did you use to solve the inequality?
- Can we find a quadratic inequality for each region of the Venn diagram? If not, can we show why?

Possible extension

- Can we find a different set of inequalities that can be placed in the regions in the Venn diagram?
- Can we find a different set of conditions so it is possible that all eight regions of the Venn diagram can be filled with quadratic inequalities?