

Approaching asymptotes

Teacher notes

Why use this resource?

A possible follow up to [Function squares](#), this algebra-free resource is designed to provoke discussion and help build up students' sense of what asymptotes are.

Students are presented with a list of statements about asymptotes and a collection of sketch graphs. They can use the graphs and statements to help decide whether the graphs have asymptotes and whether the statements are good descriptions of what an asymptote is.

Note that in the descriptions of the features of the graphs, tangents are mentioned, but points of inflection are not mentioned.

Preparation

If using as a card sort, the printable cards should be prepared. Otherwise, one or both sheets of graphs could be given to students to discuss and to add possible asymptotes.

Possible approach

Show students the warm-up and ask them what an asymptote is. Students' descriptions of asymptotes, together with those suggested in the resource should be available for students to refer to when looking at the graphs.

Give students a few minutes to look through the graphs before starting to identify those with asymptotes. Students may find it helpful to draw in asymptotes, or at least see if there could be an asymptote by lining up a ruler. The resource is designed to promote discussion so students might start in pairs and then make small groups with another pair before a class plenary where they should be prepared to justify their position.

Once students have started to identify which graphs have asymptotes, you could ask them to start to note this on a board. If students say that a graph has asymptotes, it may also be interesting to ask them to say how many.

Students may find it difficult to give reasons why graphs do or do not have asymptotes. To support this, they could be asked to read through the explanations in the solutions for three graphs they find most interesting before having a plenary discussion on what they think an asymptote is.

Key questions

- Can you justify your decision?
 - What might be true of the function where there are vertical asymptotes?
 - Do asymptotes have to be straight lines?
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A version of this resource has been featured on the [NRICH website](#). You might like to look at some students' solutions that have been submitted there.