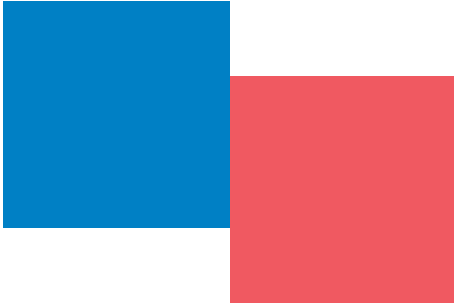


Is there a theorem?

Problem sheet



Imagine two identical 10×10 cm squares. One is fixed (blue). The other (red) square can only slide along their touching edges, always maintaining contact and keeping the same orientation.

Imagine any point inside the red square. Now, in your mind's eye, slide the red square all the way round the blue one.

How far has your chosen point moved? How have you calculated this distance?

If you had chosen a different point inside the red square, would your answer be any different?

Now imagine a 5×5 cm red square sliding round a 10×10 cm blue square. Choose any point inside the red square. How far does it travel? How have you calculated this distance?

Is there anything in common with your earlier solution?

Now imagine a 20×20 cm red square sliding round a 10×10 cm blue square. Choose any point inside the red square. How far does it travel? How have you calculated this distance?

Is there anything in common with your earlier solutions?

Now imagine a red equilateral triangle of side 10 cm sliding round an identical blue equilateral triangle. Choose any point inside the red triangle. How far does it travel? How have you calculated this distance?

How can your earlier observations help you with this problem?

What happens if you imagine a red equilateral triangle of side 5 cm sliding round the blue equilateral triangle of side 10 cm?

How about a red equilateral triangle of side 20 cm?

What connects all your results?

Is there a theorem here?