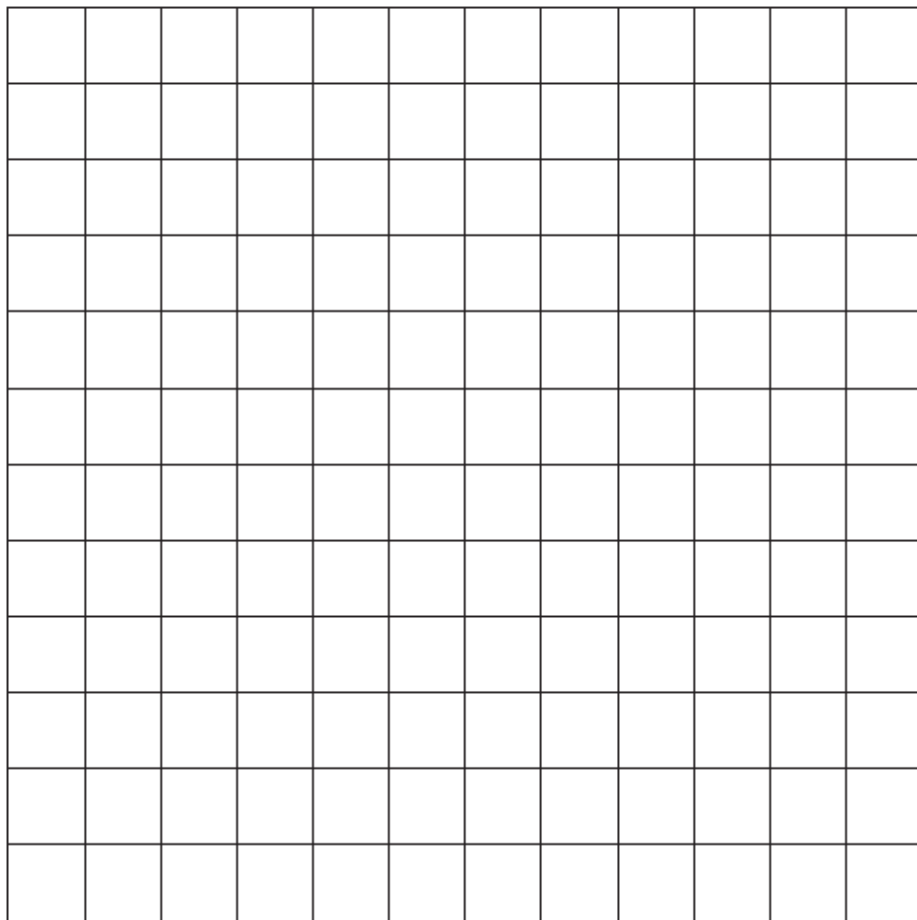


1) Investigate if Alice's and Oliver's statements are true or false by drawing example shapes for each.



Oliver

I can draw a shape with the same perimeter and the same area.



Alice

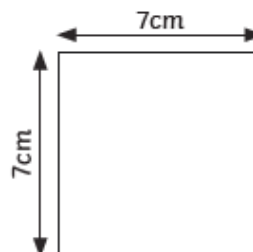
I can draw two shapes that have an area of 4cm^2 but different perimeters.

2) Three of these squares are made into a new shape.



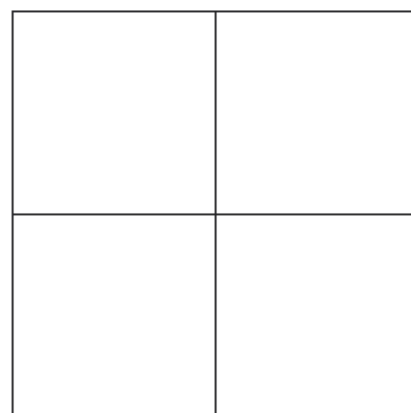
Ben

I think that the new shape has an area and perimeter that is three times that of the original square.



a) Do you agree with Ben's statement? What mistake do you think he has made?

b) Give the area and perimeter of the new shape.



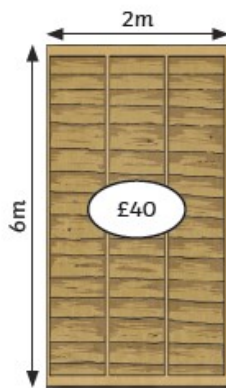
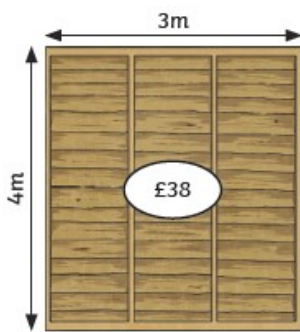
- 1) A shop sells fence panels with a wooden frame going all the way round each panel. The price of each panel is based on the area of the panel and the length of the wooden frame around the panel.



Use the prices given to investigate how much the shop charges per square metre of the panel and per metre for the wooden frame.

- a) Each 1m^2 of fence panel costs:

- b) 1 metre of wooden frame costs:



- 1) Alice's statement is true. A $2\text{cm} \times 2\text{cm}$ square will give an area of 4cm^2 and a perimeter of 8cm . A $1\text{cm} \times 4\text{cm}$ rectangle will give an area of 4cm^2 and a perimeter of 10cm . Shapes with different dimensions are also possible.

Oliver's statement is true. A $4\text{cm} \times 4\text{cm}$ square will give an area of 16cm^2 and a perimeter of 16cm . Another solution is a $6\text{cm} \times 3\text{cm}$ rectangle which will give an area of 18cm^2 and a perimeter of 18cm .

Alice's
shape

Area = 4cm^2
Perimeter = 8cm

Alice's
shape

Area = 4cm^2
Perimeter = 10cm

Oliver's
shape

Area = 16cm^2
Perimeter = 16cm



- 2) a) Ben is partly correct. He is correct in thinking that the area will be three times that of the original square, however, the new shape has four of the original sides inside the shape, therefore its perimeter will not be three times as large as the original square's perimeter.
- b) The area of the new shape will be 147cm^2 as
 $7 \times 7 = 49\text{cm}^2$ and
 $3 \times 49\text{cm}^2 = 147\text{cm}^2$
 The new shape has four of the original square's sides inside the shape, therefore its perimeter is 56cm .

- 1) a) 1m^2 of a fence panel = $\pounds 2$ per m^2
 b) 1 metre of the length of wooden frame around the panel = $\pounds 1$ per metre

