

**Stage 3 ★★****Mixed Selection 1****1. Tangram area**

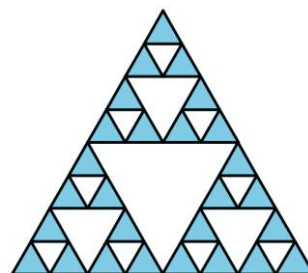
The seven pieces in this $12\text{cm} \times 12\text{cm}$ square make a Tangram set.

What is the area of the shaded parallelogram?

**2. Triangles' triangle**

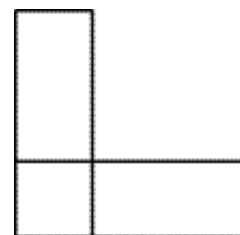
The perimeter of the large triangle is 24 cm.

What is the total length of the black lines used to draw the figure?

**3. L-emental**

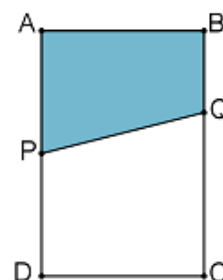
Two identical rectangular cards are glued together as shown, to form an 'L' shape. The perimeter of this 'L' shape is 40 cm.

What can you say about the length and width of the original rectangles?

**4. Guillotine**

$ABCD$ is a rectangle. P is the midpoint of AD ; the length of BQ is one third the length of BC .

What fraction of the area of the rectangle is the area of the shaded quadrilateral $ABQP$?

**5. Margins**

A $30\text{cm} \times 40\text{cm}$ page of a book includes a 2cm margin on each side, as shown.

What percentage of the page is occupied by the margins?



These problems are adapted from UKMT Mathematical Challenge problems (ukmt.org.uk)