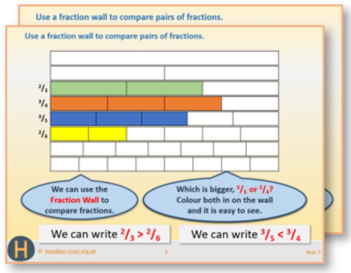
Week 10, Day 3

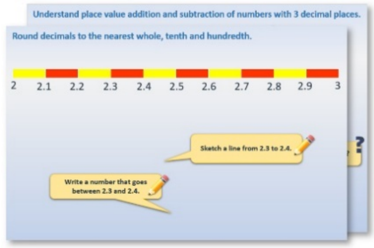
Translations, rotations and reflections

Each day covers one maths topic. It should take you about 1 hour or just a little more.

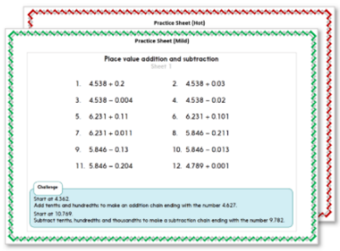
1. If possible, watch the **PowerPoint presentation** with a teacher or another grown-up.



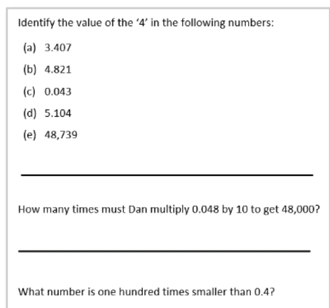
OR start by carefully reading through the **Learning Reminders**.



2. Think you've got it? Have a go at the **Investigation**.



3. Have I mastered the topic? A few questions to **Check your understanding**.
Fold the page to hide the answers!

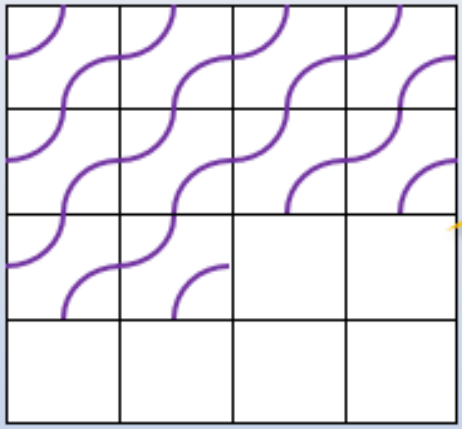


Learning Reminders

Translations, rotations and reflections.

Striking patterns can be produced by repeating a small, very simple design, and either

- translating it (sliding it along),
- rotating it (through 90° or 180°), or
- reflecting it (horizontally and vertically).



We are going to slide and copy this design into the next square (translation). If we carry on doing this, what will the final pattern look like?

Learning Reminders

Translations, rotations and reflections.

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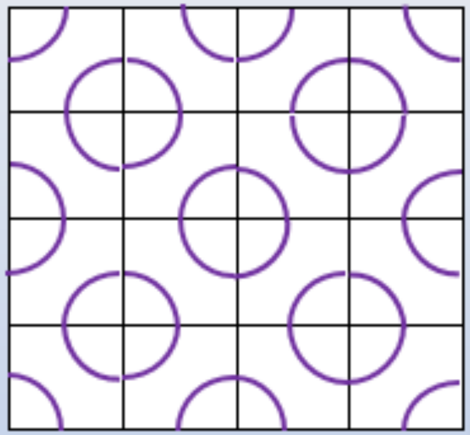


If we reflect the pattern in a vertical line of symmetry, we will get a different pattern.

To get the next line we can reflect the pattern in a horizontal line of symmetry.

And then reflect it again, and again.

We could also rotate the pattern through 90°, but in this case the pattern would look the same.

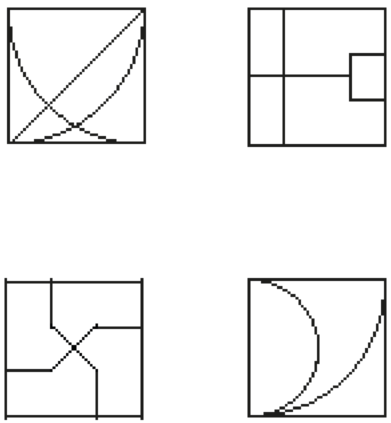
Investigation

Translations, rotations and reflections

Draw a 4cm by 4cm square on cm^2 paper, and divide it into 16 equal squares.

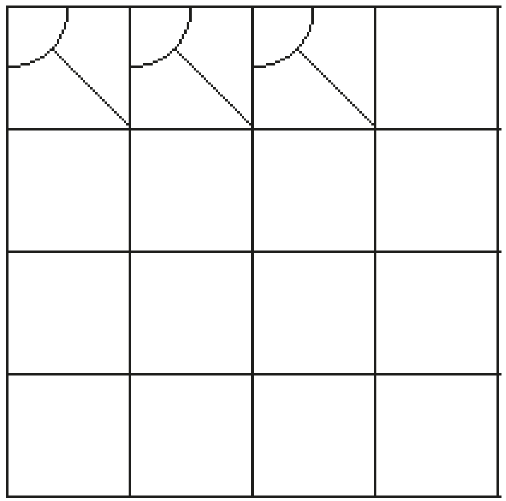
Choose one of the following designs (or make up your own) and use it to make different patterns using repeated translations, reflections or rotations.

Other designs

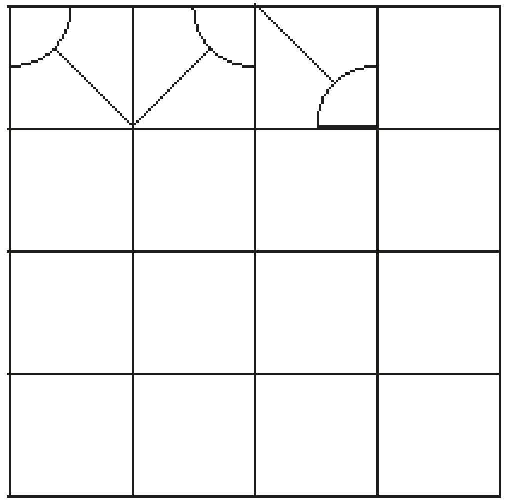


Remember to draw the design as accurately as you can!

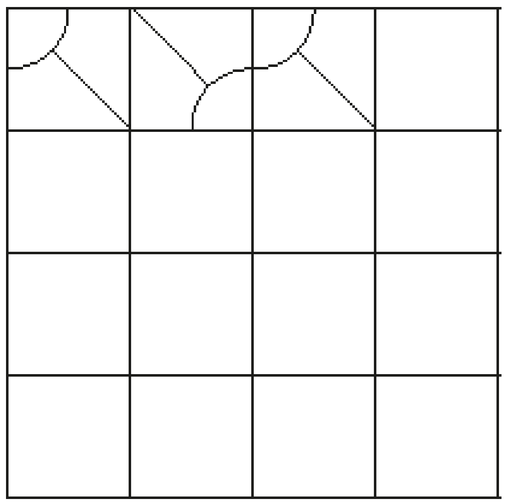
Translation



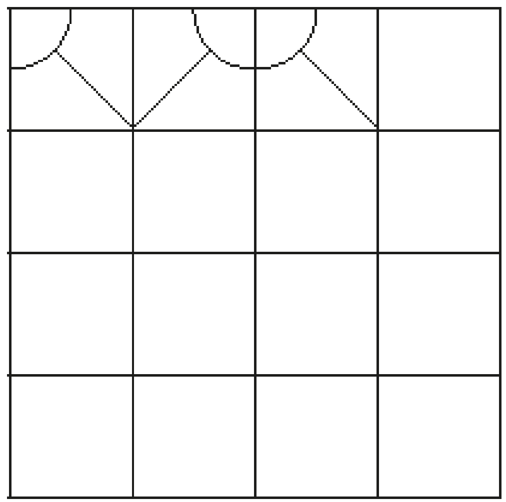
90° rotation



180° rotation



Reflections



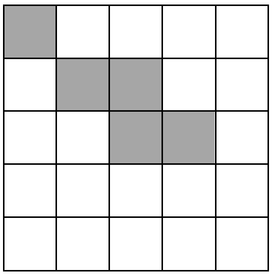
Investigation

Translations, rotations and reflections

Check your understanding

Questions

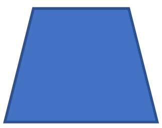
Shade two more boxes on this square grid to make a design that has a line of symmetry:



A triangle with co-ordinates (-2, -2), (-2, 3) and (1, -2) is translated 6 grid squares to the right and 5 up.
What are the co-ordinates of its new position?

(0,0) (5,0) (5,5) (0,5) are the co-ordinates of the vertices of a shape.
When it is reflected in the y-axis, two pairs of co-ordinates do not change. Why not?
Sketch it to explain.

This shape is rotated 90˚ clockwise. Draw its new position.

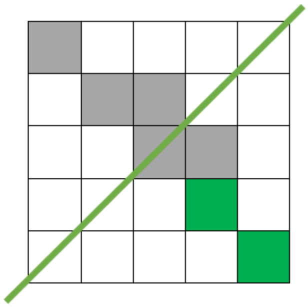


How many more times must it be rotated through 90˚ clockwise to arrive at its original position?

Check your understanding

Answers

Shade two more boxes on this square grid to make a design that has a line of symmetry:



A triangle with co-ordinates (-2, -2), (-2, 3) and (1, -2) is translated 6 grid squares to the right and 5 up.

What are the co-ordinates of its new position?

(4, 3), (4, 8) and (7, 3). Mistakes can arise when adding onto negative co-ordinates – sketching the original triangle can help counter this.

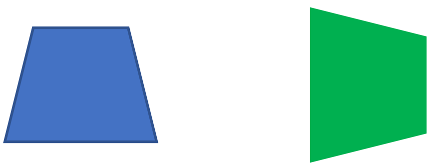
(0,0) (5,0) (5,5) (0,5) are the co-ordinates of the vertices of a shape.

When it is reflected in the y-axis, two pairs of co-ordinates do not change. Why not?

(0,0) and (0,5) do not move as they are located on the y-axis itself.

Sketch it to explain. As before, look for accurately plotted shapes.

This shape is rotated 90˚ clockwise. Draw its new position.



How many more times must it be rotated through 90˚ clockwise to arrive at its original position? 3 more times