

Notes for deducing area formulae

Teaching notes

Start the lesson by accessing either of the two forms of dynamic geometry software.

Start with the diagram showing the 'parallelogram to rectangle'.

Say that we can split the shape along the perpendicular height shown and translate the left-hand shape created by moving the slider to the right.

Before moving the slider, ask pupils to sketch what they think will happen if the shape is translated 4 squares to the right. Demonstrate what happens.

Return the shape to its initial position and ask for predictions or thoughts about the relationship between the area of a rectangle and the area of the parallelogram.

Hopefully pupils will see them as the same – and the discussion can lead to how the area of a parallelogram is the perpendicular height \times the base.

Ask pupils what they think the most common misconception is about calculating the area of a parallelogram.

The second diagram (right-angled triangle to rectangle) can be used to derive the formula for the area of a triangle in the same way but using rotation.

By the time you show the third diagram pupils might be able to anticipate what is about to happen – especially after the midpoints have been put in. Partially rotating can be a clue.

Diagrams 4 and 5 can be developed in the same way, with the emphasis on deriving the formulae from the pupils where possible.

Note that in most diagrams the initial shapes can be changes – the vertices will 'snap to grid'.

It is a good idea to experiment with the diagrams before attempting to teach the lesson.

Teaching points

- This activity will involve much discussion with pupils and they should be encouraged to keep their own informal notes and diagrams.
- Encourage pupils to use the appropriate vocabulary where possible.
- Give time for paired discussion.

- Throughout the exercise, continue to encourage discussion.
- A discussion about the distinction between a demonstration and a proof could be interesting here.