

Description

- Use formulas and diagrams to find the area and perimeter of irregular polygons (composite figures).

Materials

- Tangram sets
- grid paper
- overhead grid
- BLM 15.1, 15.2

Assessment Opportunities

Minds On ...

Whole Class → Sharing

Selected students share their diagrams from Day 14. Reinforce that for partner shapes, the triangle’s area is half the quadrilateral’s area.

Pairs → Peer tutoring

Pairs of students use tangrams from Day 2 to create figures (BLM 2.7). Students predict and calculate the area of each figure in square centimetres.
Curriculum Expectations/Paper and Pencil/Marking Scheme: Use a short quiz to assess students’ understanding of calculating area for various figures.

Action!

Whole class → Guided Problem Solving

Curriculum Expectations/Observation/Mental Note: Ask students to suggest ways of finding the area of each shape on BLM 15.1. Observe the ways students subdivide the various shapes and present their illustrations on the board.

Guide students to see different ways to calculate areas of composite figures. Students should label their diagrams. Model the processes and form of written communication using one of the shapes on BLM 15.1. Discuss when each process may be most appropriate. Ask: Could you use symmetry to find the area of any of the shapes?

Think/Pair/Share → Practice

Using grid paper, partners create a composite figure together; subdivide and find areas individually and compare results. Encourage partners to find different ways.

Individual → Differentiated Practice

Assign selected questions from BLM 15.1 to students who have grasped the concept. Provide students who require more direction with BLM 15.2.

Consolidate Debrief

Individual → Response Journal

Students make entries in their math journals based on prompts such as:

- I can tell area and perimeter measurements apart by...
- Areas of triangles and quadrilaterals are related by...
- The area of composite figures can be calculated...
- When finding area of shapes without right angles...

Pose the question: Does it make sense to add the perimeters of the parts of a composite figure together to find the total perimeter? Write an explanation to communicate your thinking. Students share responses.

Home Activity or Further Classroom Consolidation

Locate some composite figures for which you could find the area and perimeter, e.g., lawn, carpet in a non-rectangular room.

Concept Practice

Decide how to explain the difference between area and perimeter to someone at home and ask them to report on the clarity of your explanation. Complete the Extend Your Thinking based on the curriculum expectation that you estimate and calculate the perimeter and area of an irregular two-dimensional shape.

Students may suggest many processes. They will likely involve either subdividing the figure into familiar shapes or extending the figure into a quadrilateral and subtracting missing area.

Subsequent steps will include:

- taking needed measurements;
- representing symbolically, substituting into formulas, then computing;
- noting appropriate units.

Once most students in the class appear ready to demonstrate proficiency at finding perimeter and area of composite figures, assess using a version of Developing Proficiency found on page 9 of the *Developing Perimeter and Area Formulas* package.

Select a student to add vocabulary to the Word Wall.

See *Developing Perimeter and Area Formulas* – Section 2 p. 12.

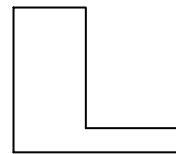
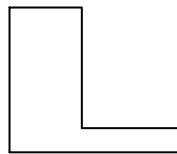
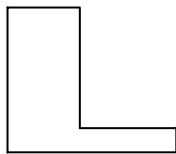
15.1: Finding the Area of Composite Figures

Name:

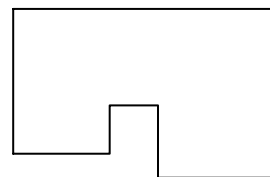
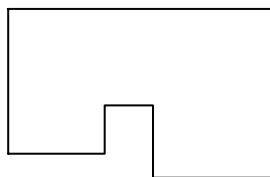
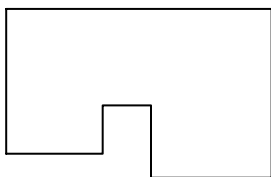
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Subdivide each shape into shapes for which you know an area formula. Do this in more than one way.

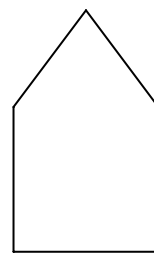
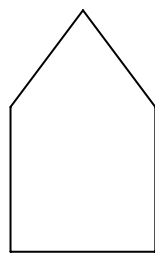
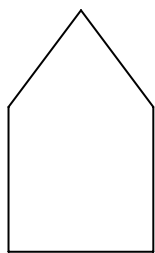
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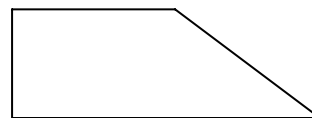
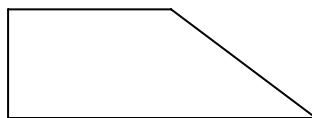
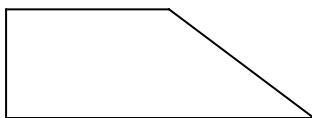
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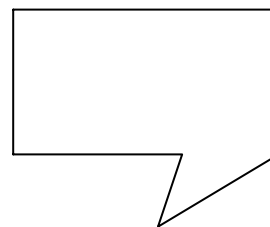
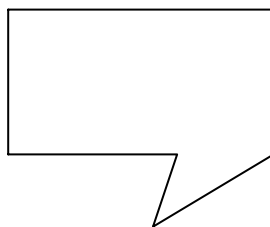
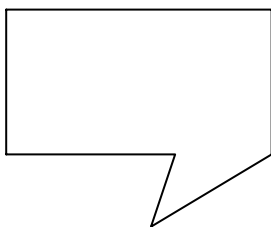
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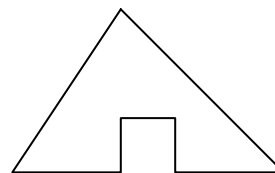
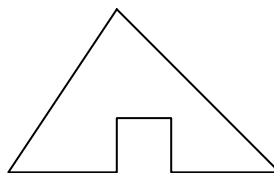
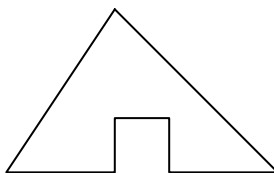
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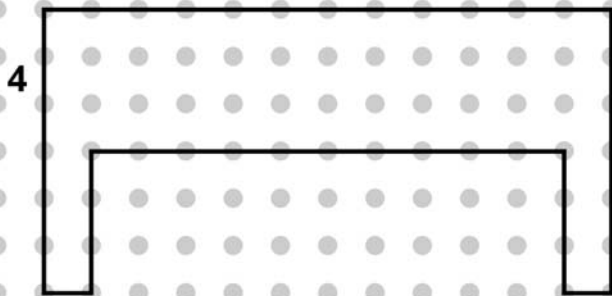
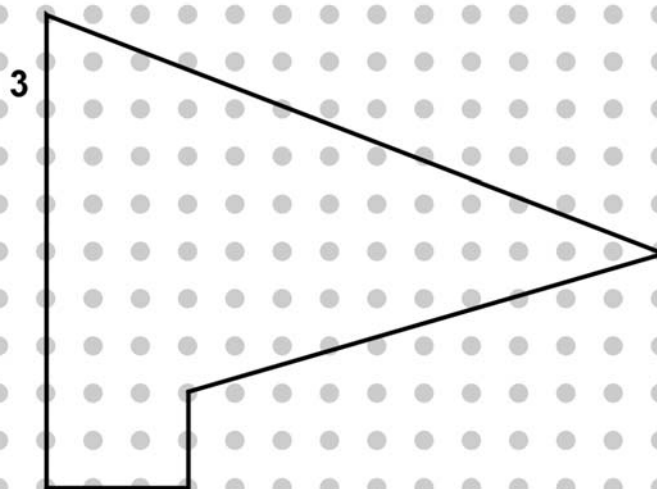
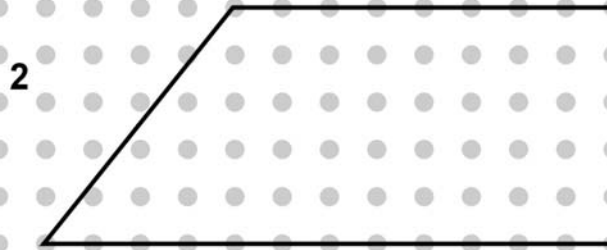
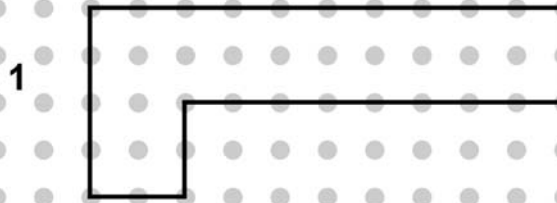
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15.2: Finding Area of Composite Figures

Name:

Date:



Find the area of this shape by:

- visualizing the addition of subdivisions
- visualizing the subtraction of areas
- using symmetry