5.6
Text page 172

Calculating the Area of a Complex Shape

You will need
- pattern blocks
- a ruler
- a calculator

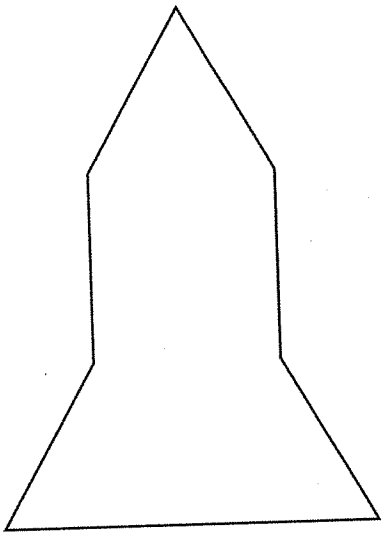
▶ **GOAL** Calculate the area of an irregular 2-D shape by dividing it into simpler shapes.

Problem 1

Use these steps to calculate the area of this shape.

Hint

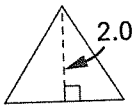
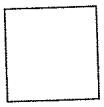
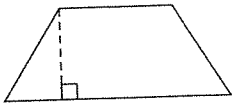
Use a red trapezoid, a green triangle, and an orange square.



Step 1: Cover the shape completely with pattern blocks.
Draw lines on the shape to divide the shape into three simpler polygons.

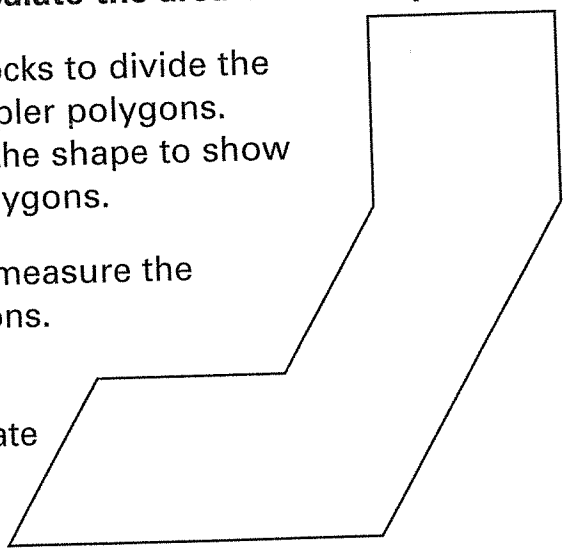
Step 2: Use a ruler to measure the simpler polygons. Calculate their areas.

Step 3: Complete the table to calculate the total area of the shape using the areas of the simpler polygons.

Simpler polygon	Area of simpler polygon
	$A = b \times h \div 2$ $= 2.5 \times 2 \div 2$ $= 2.5\ cm^2$
	$A = l \times w$ = =
	$A = (a + b) \times h \div 2$ = (_____ + _____) × _____ ÷ 2 = = =
Total area of shape: _____ + _____ + _____ = _____ cm^2	

Problem 2

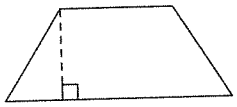
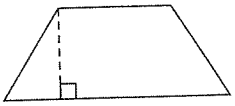
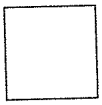
Use these steps to calculate the area of this shape.



Step 1: Use pattern blocks to divide the shape into simpler polygons. Draw lines on the shape to show the simpler polygons.

Step 2: Use a ruler to measure the simpler polygons.

Step 3: Complete the table to calculate the total area of the shape.

Simpler polygon	Area of simpler polygon
	$A = (a + b) \times h \div 2$ $=$ $=$ $=$ $=$
	
	

Total area of shape: _____ + _____ + _____ = _____ cm^2

Reflecting

▶ Explain how starting with simpler polygons helps you calculate the area of a complex polygon.

_____

_____

_____

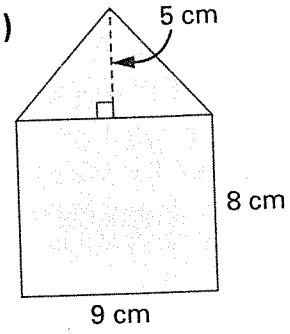
TURN

Practising

Text page 175

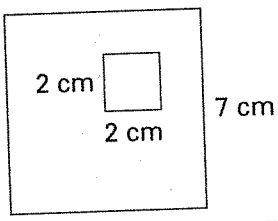
6. Calculate the area of the shaded part of each diagram. Show your work in the tables.

a)



Simpler polygon	Area of simpler polygon
Total area:	

b)

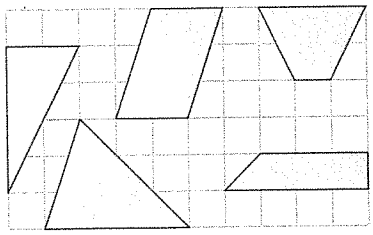


This shape has a hole in it. What operation will you need to perform to determine the shaded area?

_____

Simpler polygon	Area of simpler polygon
Total area:	

8. This diagram shows a picnic area.



Each square represents 1 m^2.
The shaded areas are grass.
The non-shaded areas need to be paved.

Calculate the total area that needs to be paved.
Show your work in the table.

Simpler polygon	Area of simpler polygon
entire picnic area	

Total shaded area:

Total area that needs to be paved: _____ (entire picnic area) − _____ (shaded area) = _____

The paving company charges \$12 to pave 1 m^2.
The total cost to pave the non-shaded area is:

\$12 × _____ = \$_____