

4.2.3 Plane Area

Name: _____ Class: _____ Date: _____

KEY WORDS perpendicular height

<!-- Session 2 native-skill companion -->

Objective

Practise plane area within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Areas, perimeters and composite plane shapes · Foundation

Triangle area is $bh/2$, parallelogram area bh and trapezium area $(a+b)h/2$ for parallel sides a, b . Heights are perpendicular to the selected base. Perimeter adds only the outside boundary. Split a composite shape into non-overlapping parts, or subtract a missing region from a containing shape.

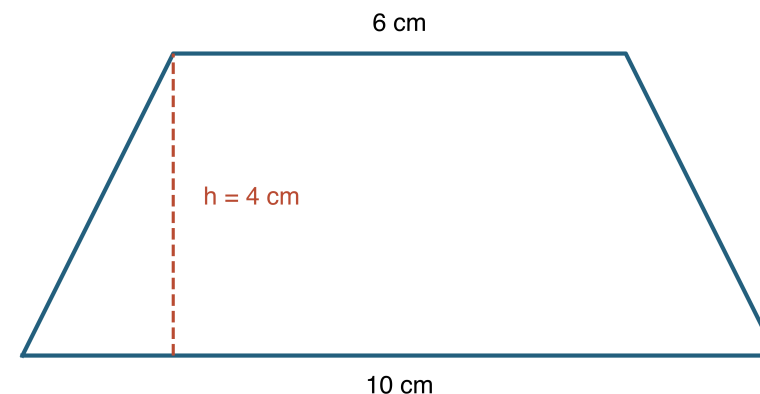
$$A_{\triangle} = \frac{1}{2}bh, \quad A_{\text{trap}} = \frac{1}{2}(a+b)h$$

A triangle with base 8 cm and height 5 cm has area 20 cm^2 ; a parallelogram with the same base/height has area 40 cm^2 . A trapezium with parallel sides 6 and 10 cm and height 4 cm has area $(6+10) \times 4/2 = 32 \text{ cm}^2$. A rectangular 8 by 6 cm sheet with a 3 by 2 cm corner removed has area $48 - 6 = 42 \text{ cm}^2$. Its perimeter is still 28 cm: the two removed outside segments total 5 cm and the two new notch edges also total 5 cm. This perimeter equality depends on a corner rectangular cut; an internal hole adds a separate boundary. Rearranging triangle area gives $h = 2A/b$.

Use perpendicular height rather than a sloping side. A shared internal division line is not part of the perimeter. An area answer has squared units; a perimeter answer has length units.

AQA G16/G17 includes triangle/parallelogram/trapezium area and composite perimeter/area. Mark the parallel bases, perpendicular height and counted outside edges before calculating.

Trapezium area = average parallel sides $\times$ height



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) Find the trapezium area for parallel sides 6, 10 and height 4.

2.2 (Foundation) Find area of 8×6 rectangle with 3×2 corner removed.

2.3 (Foundation) Find the perimeter of that corner-cut shape.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: The sloping side of a parallelogram is always its perpendicular height.

Solutions

2.1 $(6+10) \times 4/2 = 32$.

2.2 $8 \times 6 - 3 \times 2 = 42$.

2.3 Count the six outside edges; the notch replaces equal total lengths.

3.1 False. A parallelogram with base 8, sloping side 5 and perpendicular height 4 has area $8 \times 4 = 32$, not $8 \times 5 = 40$. Use the perpendicular separation of parallel sides.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.