

Area Parallelograms Trapezia

KS3 Maths · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Find the area of a parallelogram with base 8 cm and perpendicular height 5 cm

Step 1 · $A = \text{base} \times \text{perpendicular height}$

$$A = 8 \times 5$$

Step 2 · Calculate, with square units

$$40 \text{ cm}^2$$

Answer: 40 cm²

Check: Slide the end triangle across: it makes an 8 cm by 5 cm rectangle ✓

2. Now try one with the steps

Find the area of a trapezium with parallel sides 6 cm and 10 cm, 4 cm apart

Step 1 · Add the parallel sides

Step 2 · Halve and multiply by the height

Step 3 · Calculate

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Find the area of a parallelogram with base 9 cm and perpendicular height 4 cm. [1]

2. Find the area of a triangle with base 7 cm and perpendicular height 6 cm. [1]

3. Find the area of a trapezium with parallel sides 5 cm and 9 cm and height 4 cm. [2]

4. A parallelogram has base 12 cm, slanted sides of 7 cm and perpendicular height 5 cm. Find its area. [2]

5. Find the area of a trapezium with parallel sides 3.5 cm and 6.5 cm and height 8 cm. [2]

6. A parallelogram has an area of 54 cm^2 and a base of 9 cm. Find its perpendicular height. [2]

7. A shape is a 6 cm square with a triangle on top. The triangle has base 6 cm and height 4 cm. Find the total area. [2]

8. A trapezium has an area of 60 cm^2 and parallel sides of 8 cm and 12 cm. Find its height. [2]

9. A field is a trapezium with parallel sides of 40 m and 60 m, which are 30 m apart. Find its area. [2]

10. A rhombus has diagonals of 8 cm and 6 cm. Find its area. [2]

11. A $12 \text{ cm} \times 8 \text{ cm}$ rectangle has a triangle with base 4 cm and height 3 cm cut out of it. Find the area that is left. [2]

12. A trapezium has parallel sides $2x \text{ cm}$ and 10 cm , height 6 cm and area 48 cm^2 . Find x . [3]

13. A parallelogram has base 250 cm and perpendicular height 80 cm. Find its area in m^2 . [2]

14. One box of grass seed covers 20 m^2 . How many boxes are needed for the 1500 m^2 trapezium-shaped field? [1]

4. Before you hand it in

Area of a parallelogram = base $\times$ slanted side

The height must be perpendicular (at 90°) to the base. A parallelogram with base 12 cm and height 5 cm has area 60 cm^2 , whatever its slanted sides are.

Trapezium with sides 6 and 10, height 4: area = $(6 + 10) \times 4 = 64 \text{ cm}^2$

$A = \frac{1}{2}(a + b)h = \frac{1}{2} \times 16 \times 4 = 32 \text{ cm}^2$. Two copies of the trapezium make the 64 cm^2 parallelogram.

Mixing units: base 250 cm $\times$ height 0.8 m = 200

Change everything to the same unit first: $2.5 \text{ m} \times 0.8 \text{ m} = 2 \text{ m}^2$ (or $250 \text{ cm} \times 80 \text{ cm} = 20,000 \text{ cm}^2$).

Counting part of a composite shape twice

Sketch the split and shade each piece. The pieces must fit together without overlapping and without gaps.