



Parallelograms and trapezia

About 50 minutes Calculator allowed 41 marks

Date _____

A Do Now

The first question is what today's lesson needs. The others bring back earlier topics.

A1 Needed today [2 marks] **A2** Last lesson [2 marks]

A triangle has the same area as a rectangle measuring 5 cm by 16 cm. The base of the triangle is 8 cm. Find the height of the triangle.

A sector has angle 210° and radius 6 cm. Find its perimeter, in terms of π .

Answer

Answer

A3 Key Stage 3 [2 marks] **A4** Key Stage 3 [2 marks]

After a 25% increase, the price of a bike is £450. What was the price before the increase?

Amy and Ben share some sweets in the ratio 3 : 5. Ben gets 16 more sweets than Amy. How many sweets are there altogether?

Answer

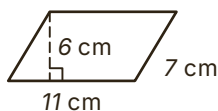
Answer

B Example, then your turn

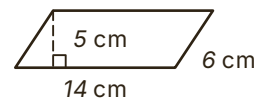
Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

Work out the area of the parallelogram.



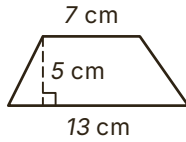
B1 Work out the area. [2 marks]



Answer

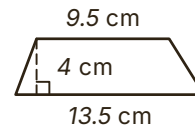
EXAMPLE 2

Work out the area of the trapezium.



B2 Work out the area.

[2 marks]



Answer

c Practice

- C1** A trapezium has area 66 cm^2 and perpendicular height 6 cm. One parallel side is 8 cm. Work out the other parallel side. [2 marks]

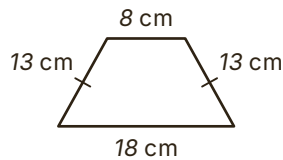
Answer

- C2** The rectangle is 10 cm by 8 cm. What percentage of it is shaded? [3 marks]



Answer

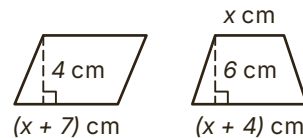
- C3** The trapezium has two equal sloping sides. Work out its area. [3 marks]



Not drawn accurately

Answer

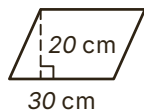
- C4** The parallelogram and the trapezium have the same area. Work out the value of x . [3 marks]



Not drawn accurately

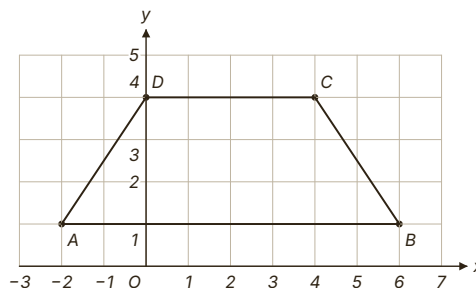
Answer

- C5** A floor of area 12 m^2 is covered [3 marks]
with tiles like this one. How
many tiles are needed?



Answer

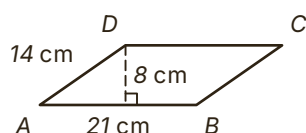
- C6** $ABCD$ is a trapezium with [2 marks]
corners $A(-2, 1)$, $B(6, 1)$, $C(4, 4)$
and $D(0, 4)$. Work out its area.



Answer

D Exam-style questions

- D1** $ABCD$ is a parallelogram. $AB = 21 \text{ cm}$ and $AD = 14 \text{ cm}$. The perpendicular distance between AB and DC is 8 cm. Lena says, "The area of $ABCD$ is $21 \times 14 = 294 \text{ cm}^2$."

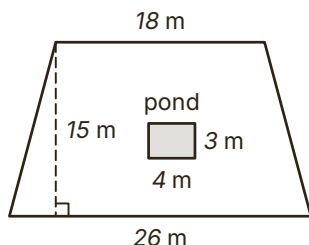


- (a) Explain why Lena is wrong. [1 mark]
- (b) Work out the perpendicular distance between AD and BC . [3 marks]

Answer

Total for D1: 4 marks

- D2** A lawn is a trapezium with a rectangular pond in it. Fertiliser is spread on the lawn [5 marks]
but not on the pond, at 35 g per m^2 . Fertiliser is sold in 1 kg boxes costing £4.50
each. Work out the cost of the fertiliser needed. You must show your working.

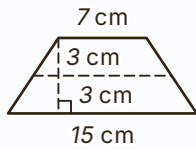


Answer

E Extension

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** The trapezium has parallel sides of 15 cm and 7 cm and a perpendicular height of 6 cm. The dashed line is parallel to them and halfway between them. It cuts the trapezium into two smaller trapezia. Work out the area of each part. [4 marks]



Answer cm² and cm²

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Each part is a trapezium of height 3 cm. You need the length of the dashed line.
- Hint 2** Halfway up, the width has changed by half of the change from 15 cm to 7 cm.
- Hint 3** The dashed line is 11 cm. Now use $\frac{1}{2}(a + b)h$ for each part.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can work out the area of a parallelogram and a trapezium, using the perpendicular height. ☐ ☐ ☐

I can work back from an area to a missing length. ☐ ☐ ☐

I can use these areas in compound shapes and problems with units and costs. ☐ ☐ ☐