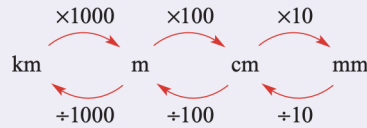


WALT find perimeter of simple and composite shapes

Success Criteria

- I can decompose composite shapes into simple shapes.
- I can calculate the perimeter of composite shapes.

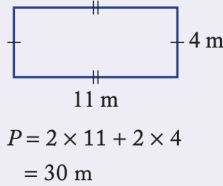
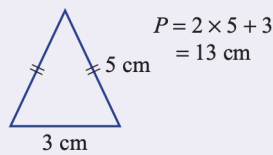
- To convert between metric units of length, multiply or divide by the appropriate power of 10.



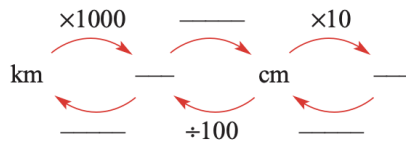
Perimeter The total distance (length) around the outside of a figure

Key ideas

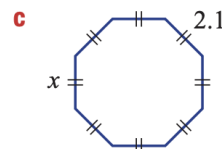
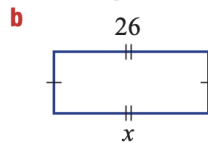
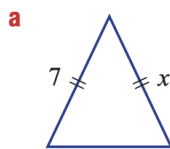
- **Perimeter** is the distance around a closed shape.
- Sides with the same markings are of equal length



1 Fill in the gaps on this flow chart.



2 Write down the value of x in these diagrams.



3 Convert the following length measurements into the units given in the brackets.

- | | |
|----------------------|----------------------|
| a 5 cm (mm) | b 41 cm (mm) |
| c 2.8 m (cm) | d 0.4 m (cm) |
| e 4.6 km (m) | f 0.9 km (m) |
| g 521 mm (cm) | h 36 mm (cm) |
| i 240 cm (m) | j 83.7 cm (m) |
| k 7000 m (km) | l 2170 m (km) |

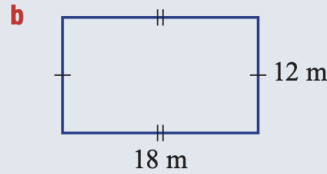
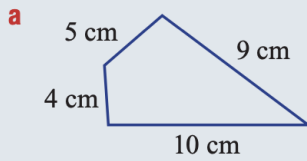
Multiply when changing to a smaller unit and divide when changing to a larger unit.



4 A steel beam is 8.25 m long and 22.5 mm wide. Write down the length and the width of the beam in centimetres.

Example 2 Finding perimeters of simple shapes

Find the perimeter of each of the following shapes.



Solution

a $P = 10 + 9 + 5 + 4$
 $= 28 \text{ cm}$

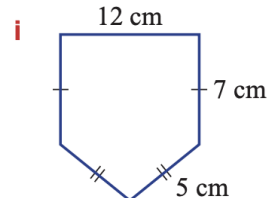
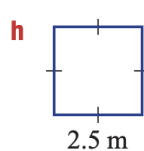
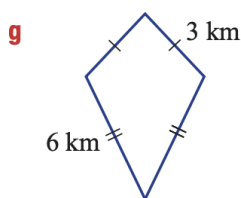
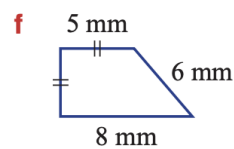
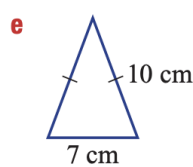
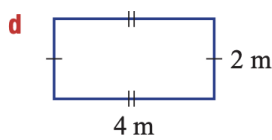
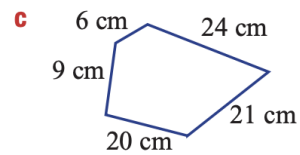
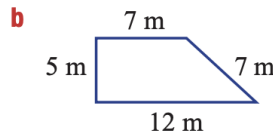
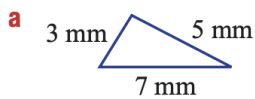
b Perimeter $= 2 \times 12 + 2 \times 18$
 $= 24 + 36$
 $= 60 \text{ m}$

Explanation

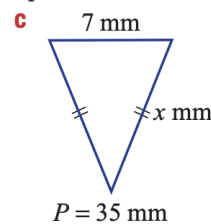
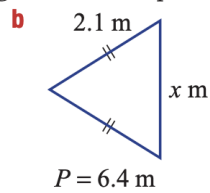
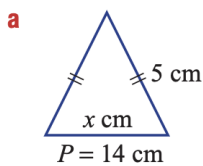
To find the perimeter, add all the side lengths together.

Two lengths of 12 m and two lengths of 18 m.

5 Find the perimeter of each of the following shapes.



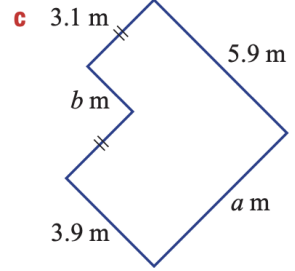
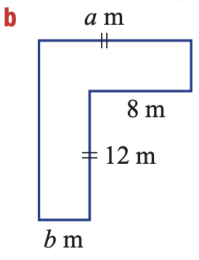
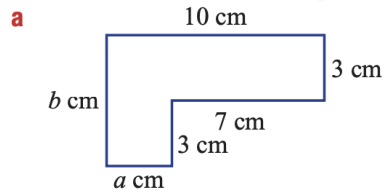
6 Find the unknown side length in these shapes with the given perimeters.



Use trial and error to find the value of x if you like.

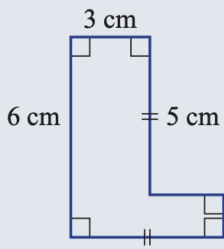


7 Write down the values of the pronumerals in these shapes.



Example 3 Finding the perimeter of composite shapes

Find the perimeter of this composite shape.

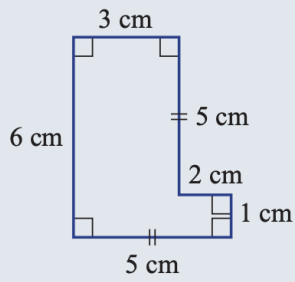


Solution

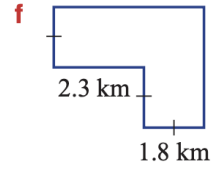
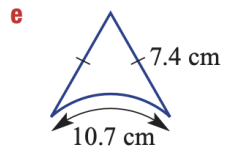
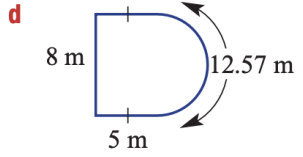
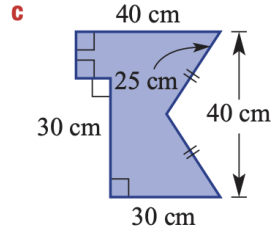
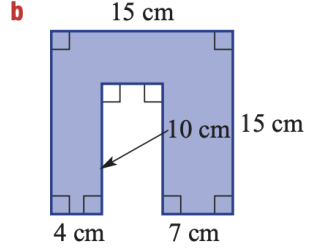
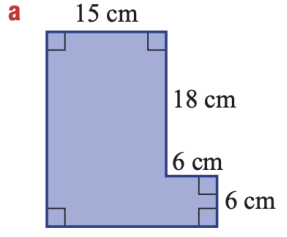
$$\begin{aligned} \text{Perimeter} &= (2 \times 5) + 6 + 3 + 2 + 1 \\ &= 22 \text{ cm} \end{aligned}$$

Explanation

Missing sides are:
 $5 \text{ cm} - 3 \text{ cm} = 2 \text{ cm}$
 $6 \text{ cm} - 5 \text{ cm} = 1 \text{ cm}$
 Alternatively,
 $2 \times 6 + 2 \times 5 = 22 \text{ cm}$



8 Find the perimeter of each of the following composite shapes.



First label all the missing side lengths then find the perimeter.



- 9 A lion cage is made up of five straight fence sections. Three sections are 20 m in length and the other two sections are 15.5 m and 32.5 m. Find the perimeter of the cage.



- 10 Convert the following measurements into the units given in the brackets.
- | | | |
|---------------|------------------|----------------------|
| a 8 m (mm) | b 110 000 mm (m) | c 0.00001 km (cm) |
| d 0.02 m (mm) | e 28 400 cm (km) | f 62 743 000 mm (km) |

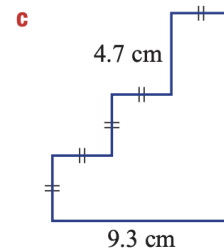
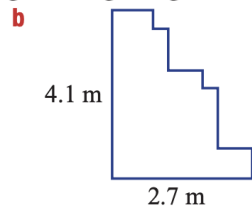
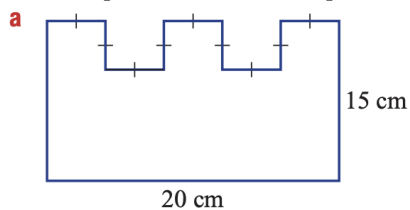
In part a, first convert to cm then to mm.



- 11 Find the perimeter of these shapes. All angles are right angles.

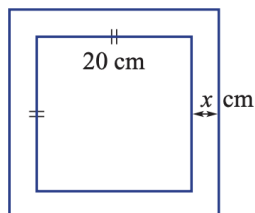
Extension

- 11 Find the perimeter of these shapes. All angles are right angles.

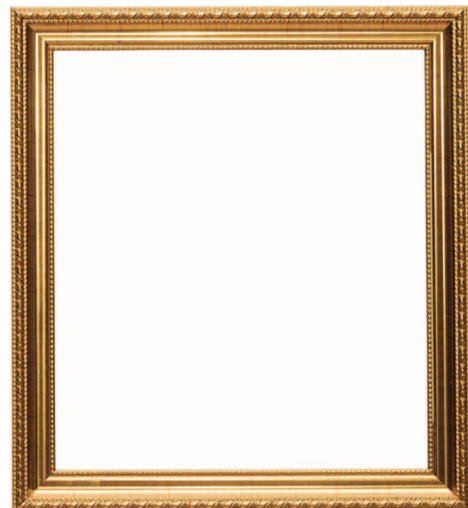


★ Picture framing

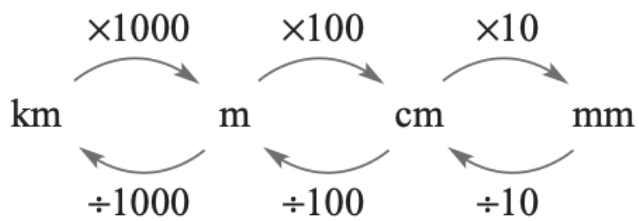
- 12 A photo 12 cm wide and 20 cm long is surrounded with a picture frame 3 cm thick. Find the outside perimeter of the framed picture.
- 13 A square picture of side length 20 cm is inside a frame of width x cm.



- a Find the perimeter of the framed picture if:
- | | |
|-------------|------------|
| i $x = 2$ | ii $x = 3$ |
| iii $x = 5$ | |
- b Write a rule for the perimeter, P , of the framed picture in terms of x .
- c Use your rule to find the perimeter if $x = 3.7$.



1



2 a 7

b 26

c 2.1

3 a 50 mm

b 410 mm

c 280 cm

d 40 cm

e 4600 m

f 900 m

g 52.1 cm

h 3.6 cm

i 2.4 m

j 0.837 m

k 7 km

l 2.17 km

4 825 cm, 2.25 cm

5 a 15 mm

b 31 m

c 80 cm

d 12 m

e 27 cm

f 24 mm

g 18 km

h 10 m

i 36 cm

6 a $x = 4$

b $x = 2.2$

c $x = 14$

7 a $a = 3, b = 6$

b $a = 12, b = 4$

c $a = 6.2, b = 2$

8 a 90 cm

b 80 cm

c 170 cm

d 30.57 m

e 25.5 cm

f 15.4 km

9 108 m

10 a 8000 mm

b 110 m

c 1 cm

d 20 mm

e 0.284 km

f 62.743 km

11 a 86 cm

b 13.6 m

c 40.4 cm

12 88 cm

13 a i 96 cm

ii 104 cm

iii 120 cm

b $P = 4(20 + 2x)$

$\therefore P = 8x + 80$

c 109.6 cm