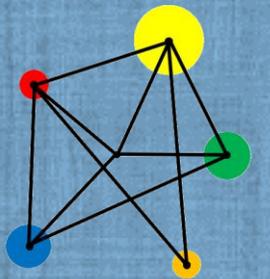# Compound Shapes

Review area and perimeter of rectangles and triangles

Calculate area and perimeter of compound shapes

Vocabulary

Compound
Made of more than one part.

Units
A unit is a standard measurement that we use to compare the size of quantities.

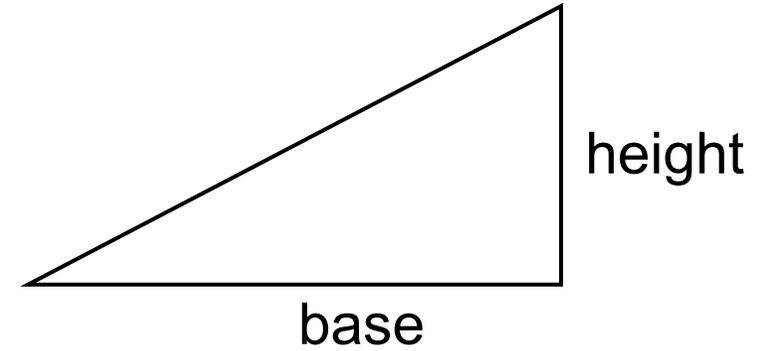**Perimeter**
The distance around a two-dimensional shape.

Area
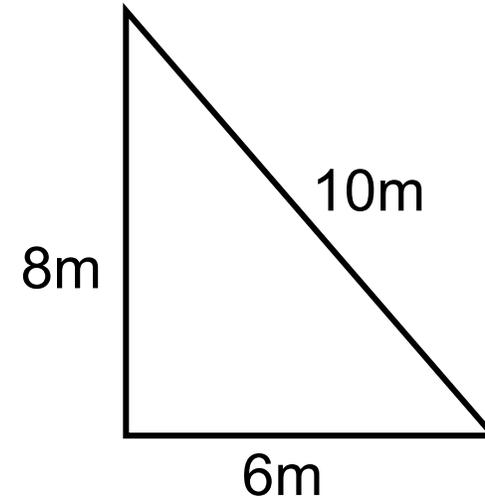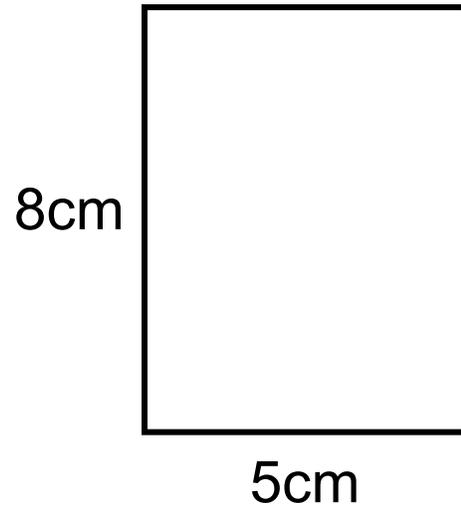The amount of space inside a shape.

Review : Rectangles & Triangles

width

length

Area = width x length

height

base

$$Area = \frac{base \times height}{2}$$

Example

Find the area and perimeter of these shapes.
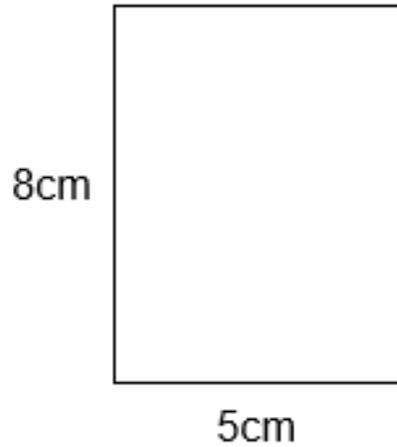
8cm

5cm

10m

8m

6m

Solution

$$Area = 8 \times 5$$

$$= 40cm^2$$

$$Perimeter = 8 + 5 + 8 + 5$$

$$= 26cm$$

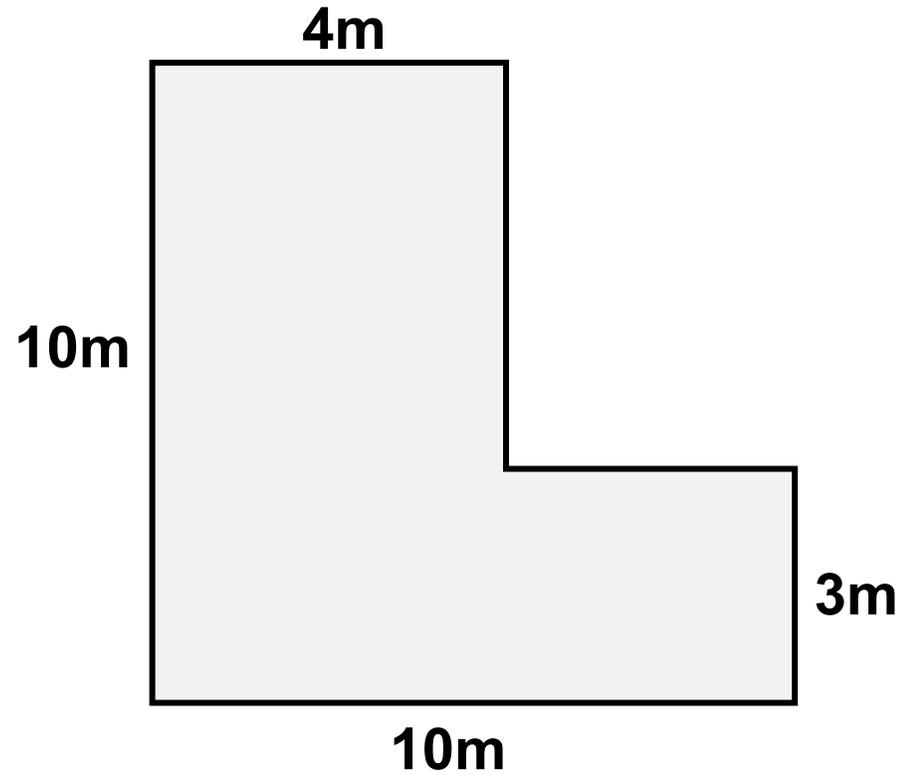$$Area = \frac{6 \times 8}{2}$$
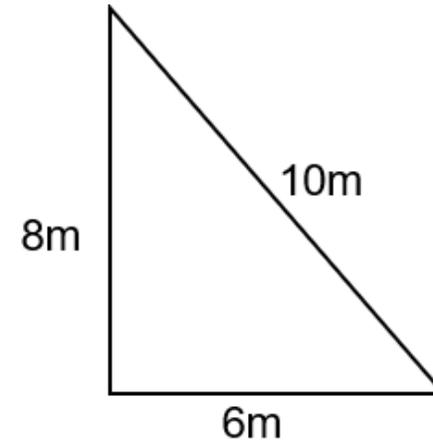
$$= 24m^2$$

$$Perimeter = 8 + 6 + 10$$

$$= 24cm$$

Example

A **compound** shape is made up of more than one part.
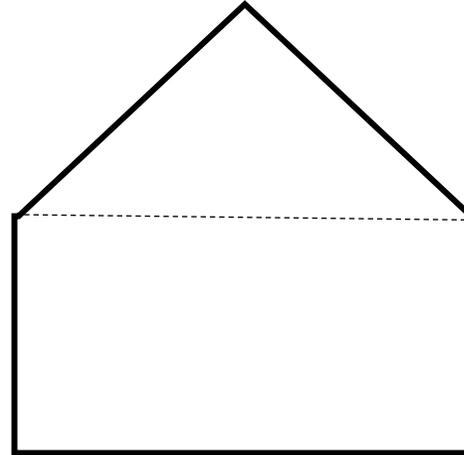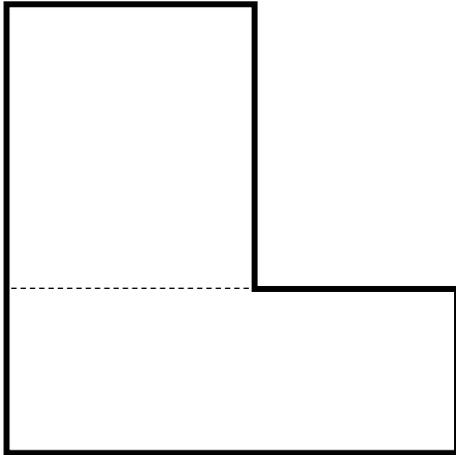
Example

Find the area and perimeter of this compound shape.

4m

10m

3m

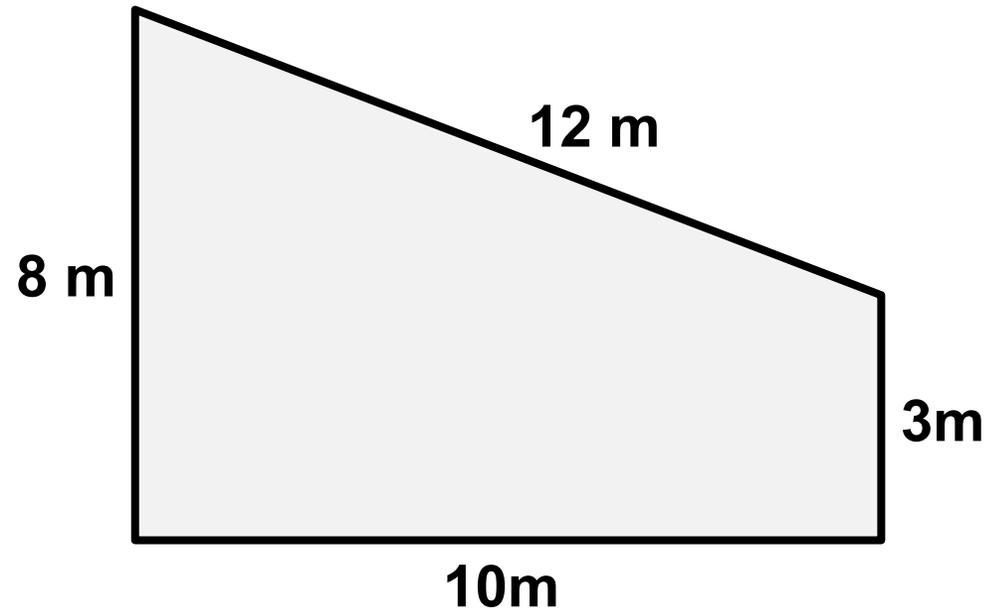10m

Solution

4m

10m

7m

Area
=
4 x 10

6 m

3m

Area
=
6 x 3

10m

Area = 4 x 10 + 6 x 3
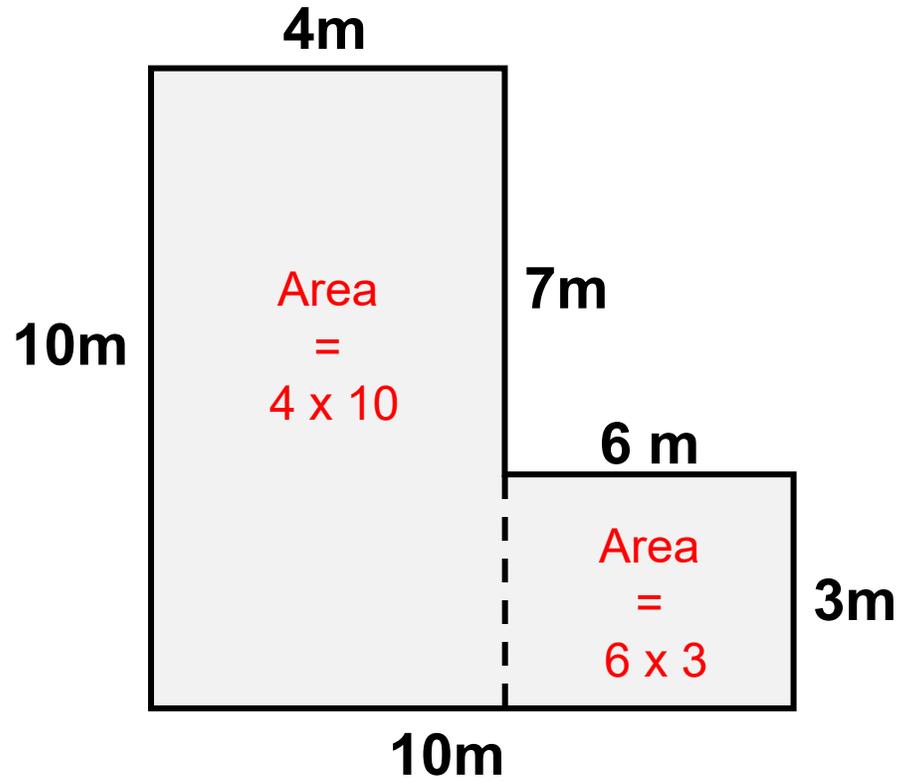
= 58 m^2

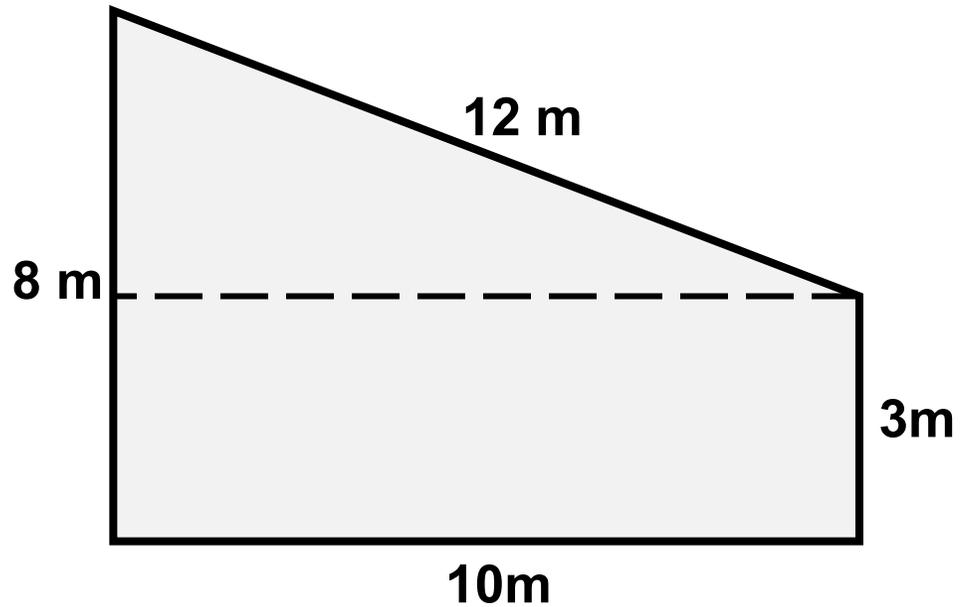Perimeter = 4 + 7 + 6 + 3 + 10 + 10

= 40 m

You try ...

Find the area and perimeter of this compound shape.

12 m

8 m

3m

10m

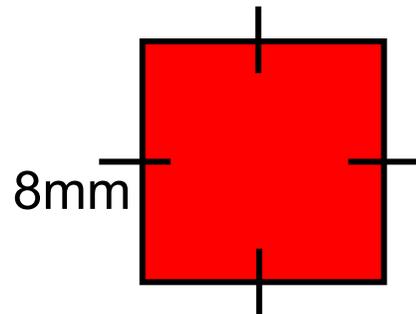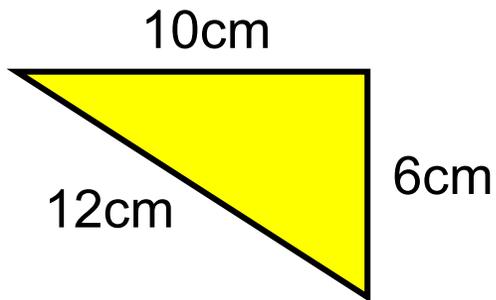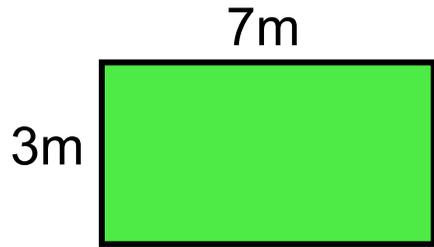# Example

Find the area and perimeter of this compound shape.

$$\text{Area} = 10 \times 3 + \frac{10 \times 5}{2}$$

$$= 30 + 25$$

$$= 55m^2$$

$$\text{Perimeter} = 10 + 3 + 12 + 8$$

$$= 33m$$

Exercise

Find the area and perimeter of each shape.

7m

3m

10cm

12cm

6cm

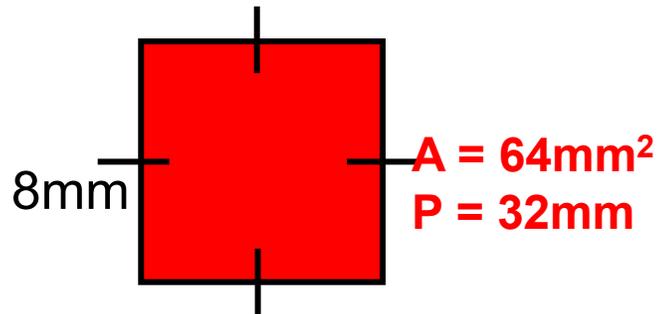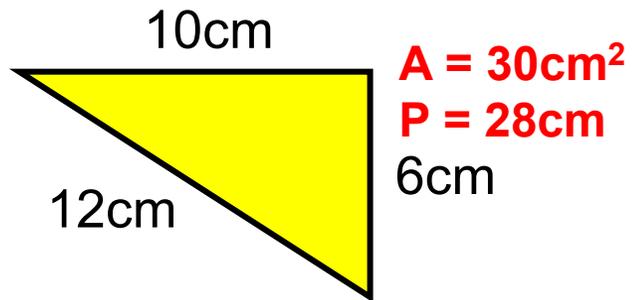8mm

Find the area and perimeter of each shape

6m

12m

6m

12m

13cm

10cm

5m

12cm
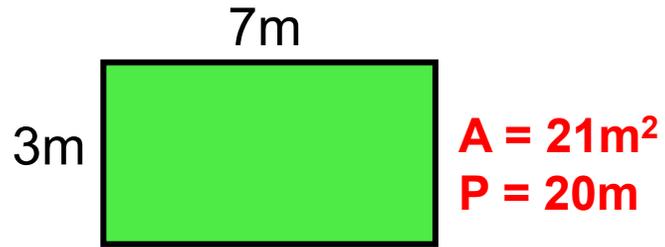
Find the area and perimeter of this shape.

1km

600m

400m

800m

Exercise

Find the area and perimeter of each shape.

7m

3m

A = 21m²
P = 20m

10cm

A = 30cm²
P = 28cm

12cm

6cm

8mm

A = 64mm²
P = 32mm

Find the area and perimeter of each shape

6m

12m

A = 108m²
P = 48m

6m

12m

13cm

10cm

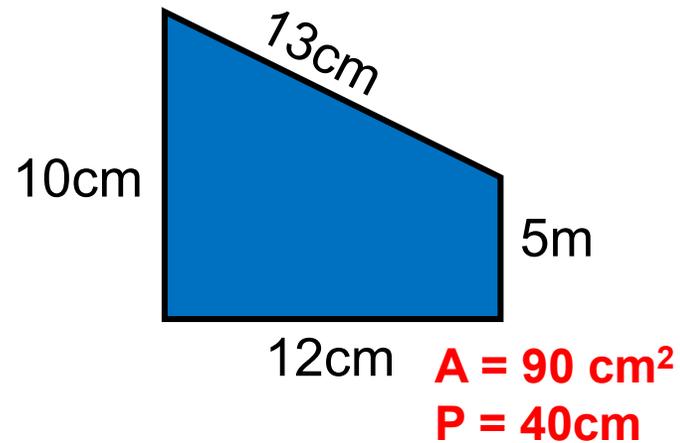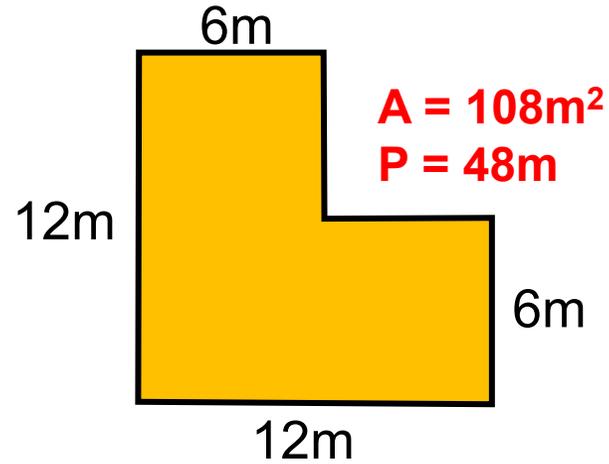5m

12cm

A = 90 cm²
P = 40cm

Find the area and perimeter of this shape.

1km

600m

400m

800m

A = 560 000m²
P = 5 600m
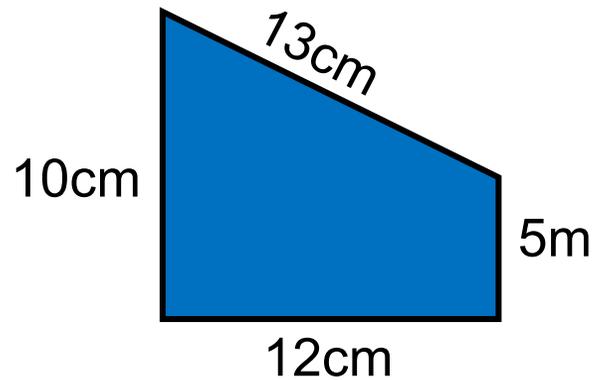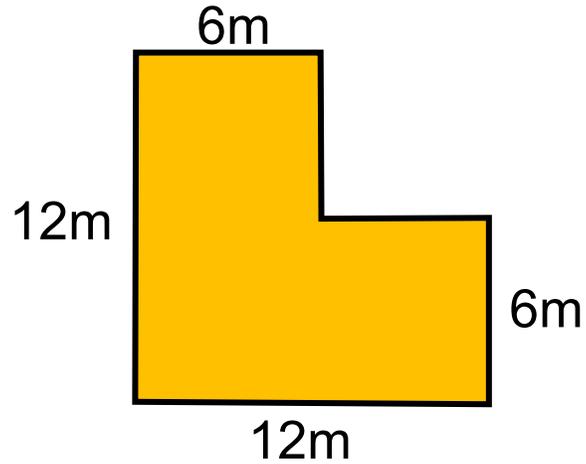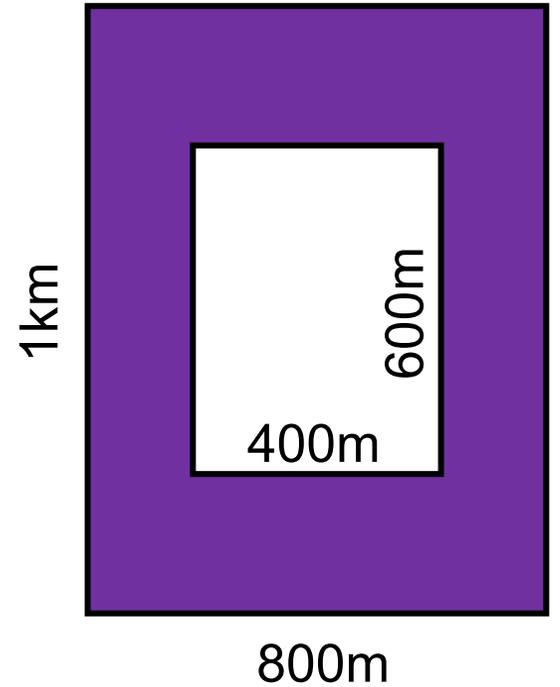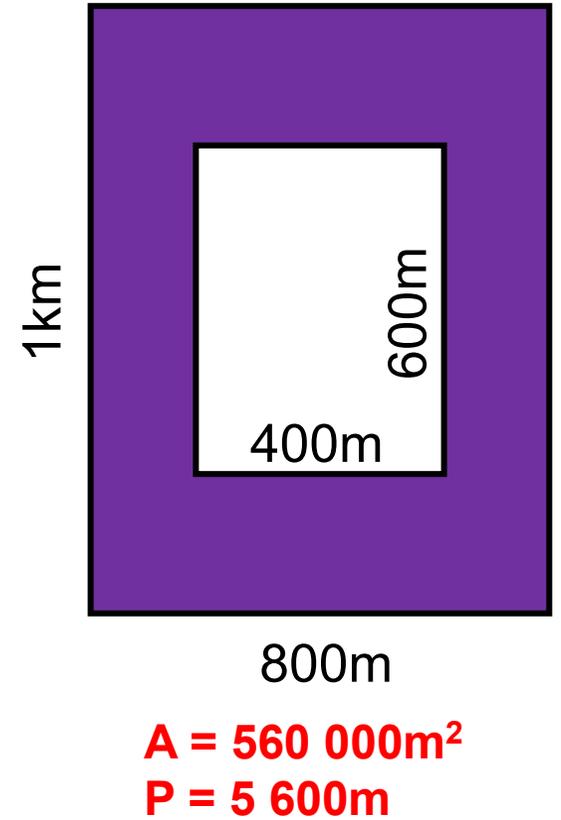
The Trapezium

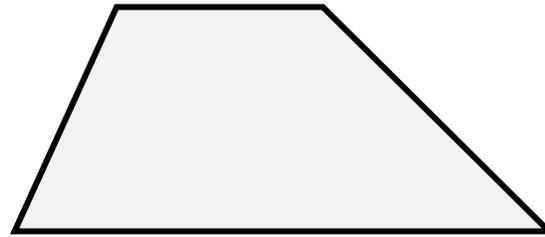A trapezium is defined as a quadrilateral with one pair of parallel sides.
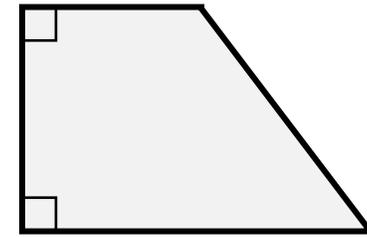
Try to draw a trapezium.

The Trapezium

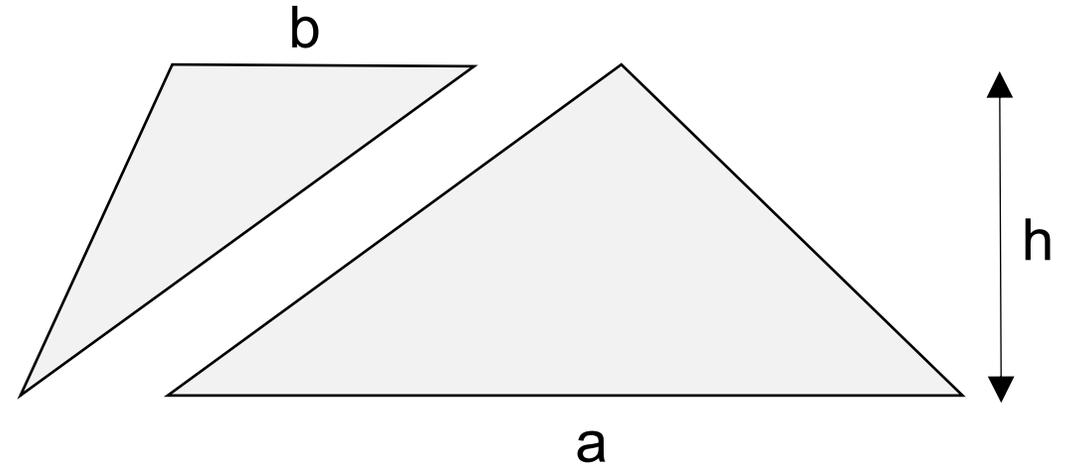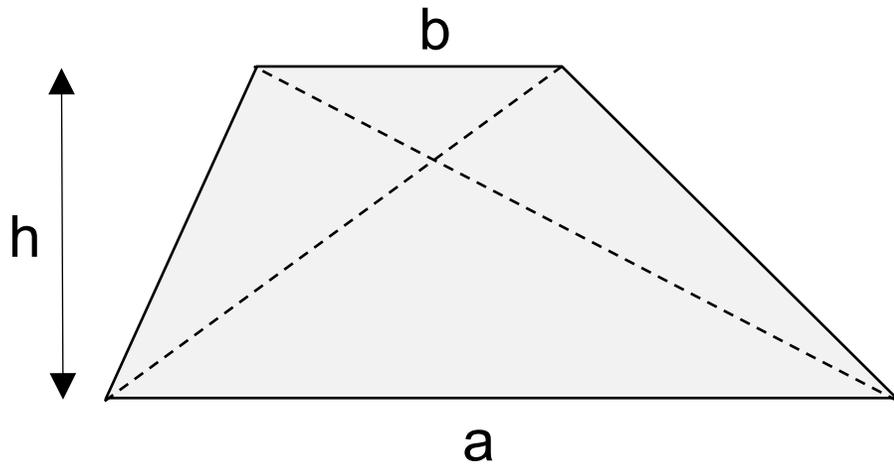There are 3 types of trapezium.

Isosceles
trapezium

Scalene
trapezium

Right angled
trapezium
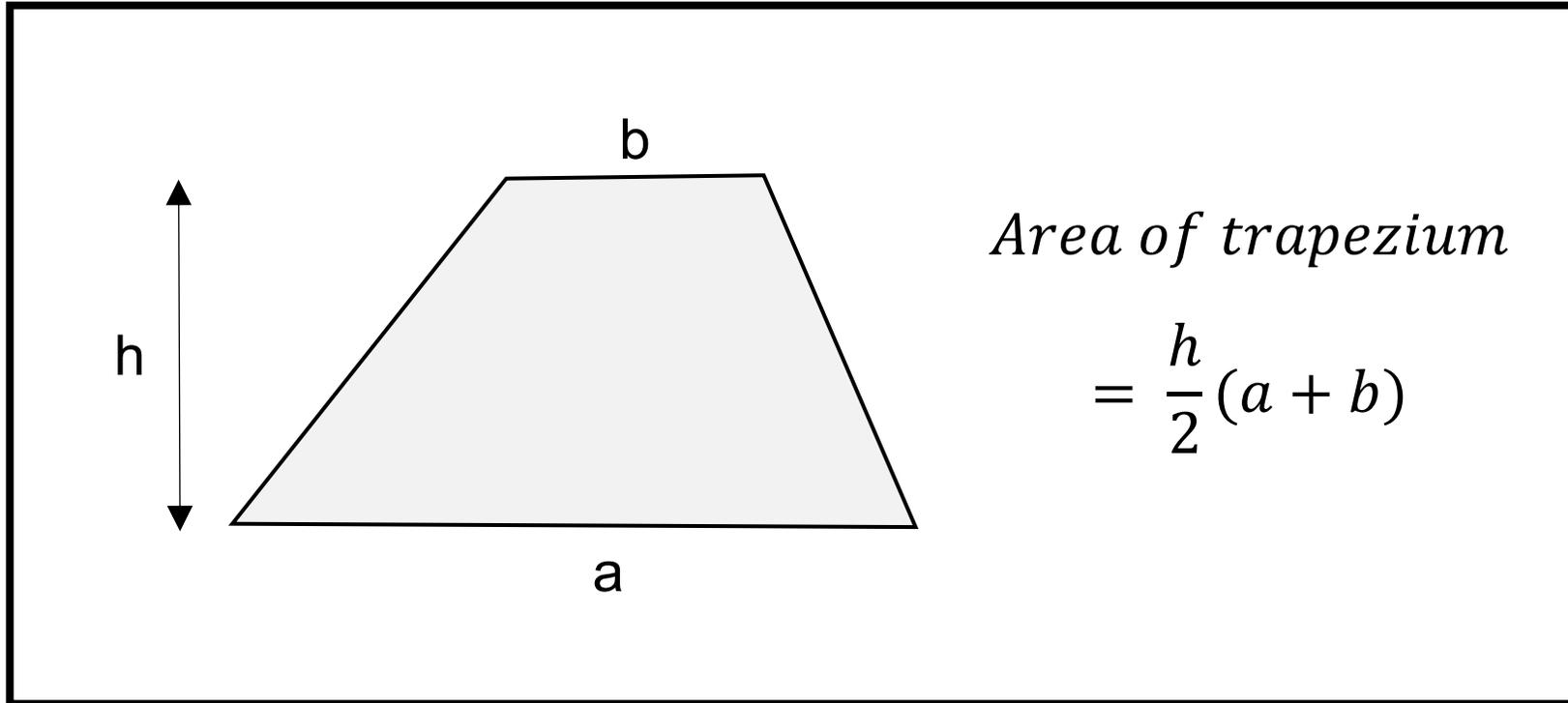
The Trapezium

The area of a trapezium can be found by splitting it into two triangles.

$$Area = \frac{ah}{2} + \frac{bh}{2}$$

$$= \frac{h}{2}(a + b)$$

Key Fact

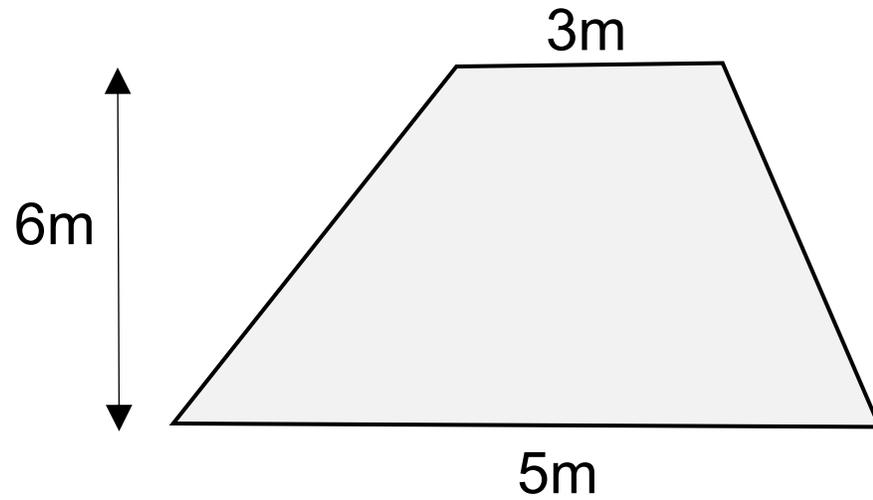Area of trapezium

$$= \frac{h}{2}(a + b)$$

Example
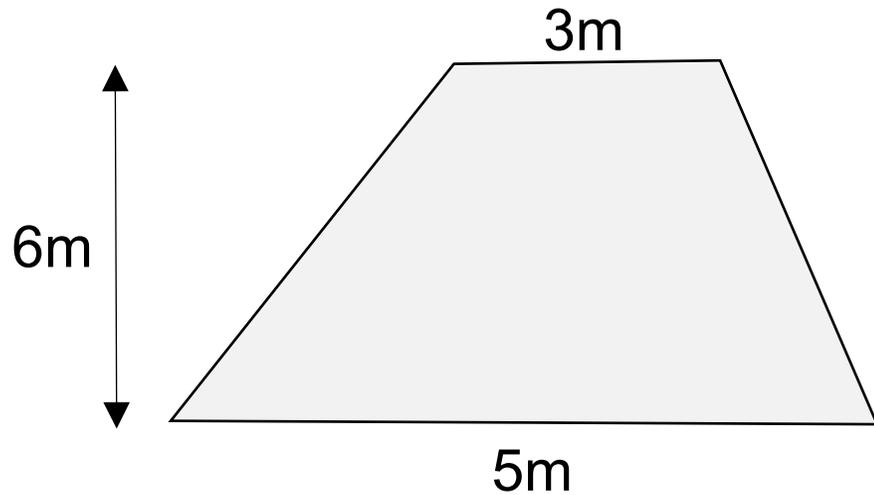
Find the area of this trapezium.
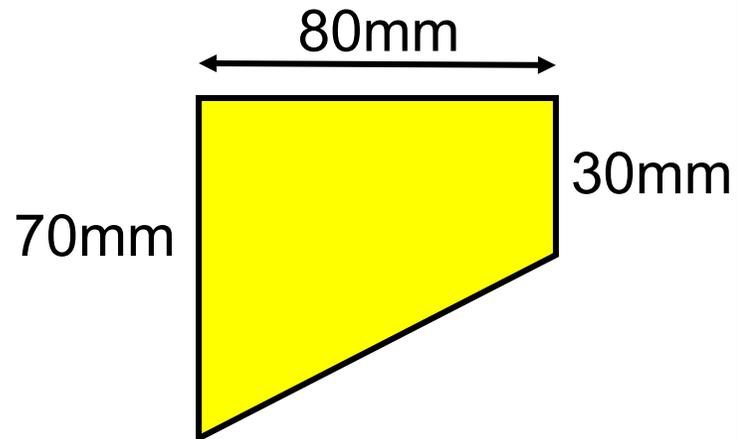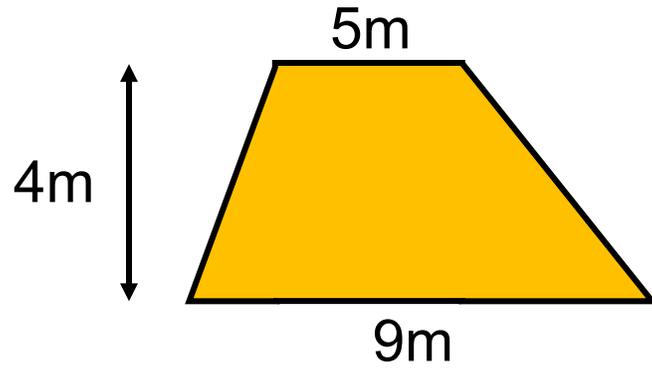
$$Area = \frac{h}{2}(a + b)$$

3m

6m

5m

Solution

Find the area of this trapezium.

$$Area = \frac{h}{2}(a+b)$$

$$= \frac{6}{2} \times (5+3)$$

$$= 3 \times 8$$

$$= 24m^2$$

Exercise

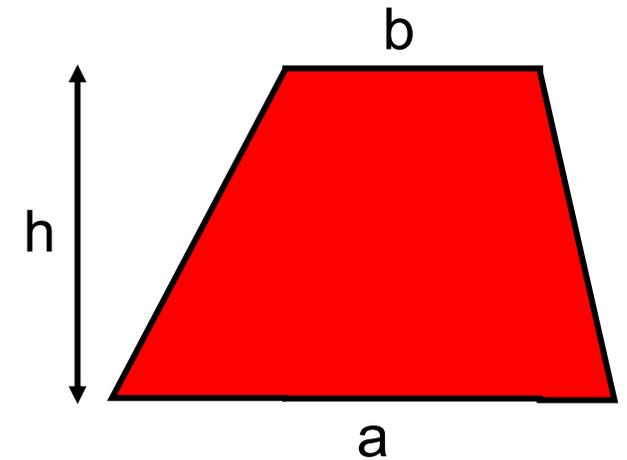Find the area of each trapezium.

5m

4m

9m

80mm

70mm

30mm

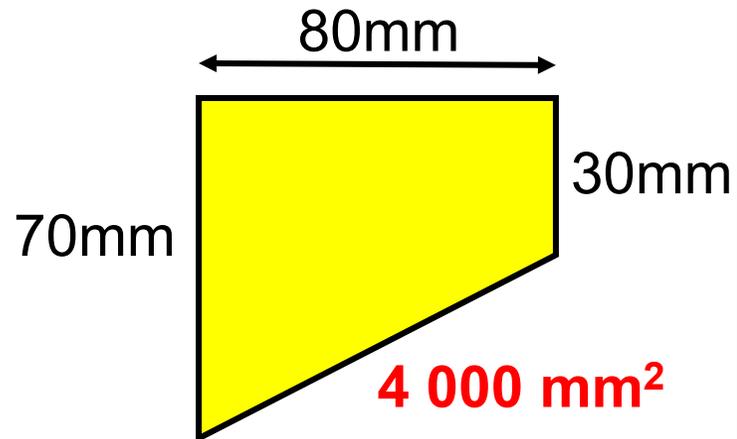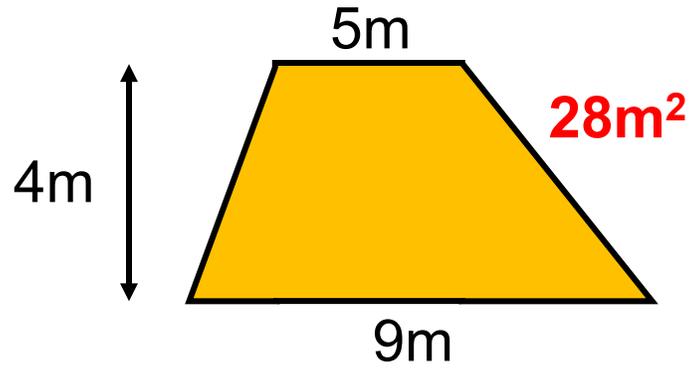The area of this trapezium is 168 cm^2.
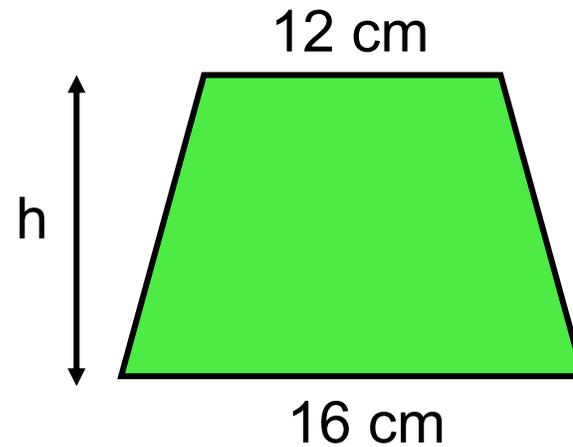
Find the length of h

12 cm

h

16 cm

How many integers can you choose for a, b & h so that the trapezium has an area of 18 m^2.

b

h

a

Exercise

Find the area of each trapezium.

5m

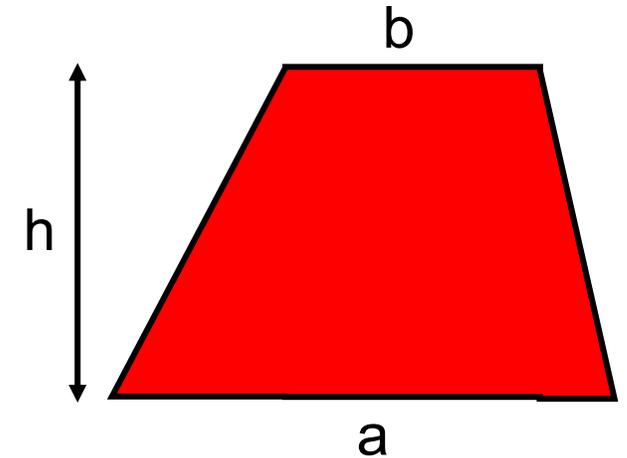4m

28m²

9m

80mm

30mm

70mm

4 000 mm²

The area of this trapezium is 168 cm².

Find the length of h

12 cm

h

16 cm
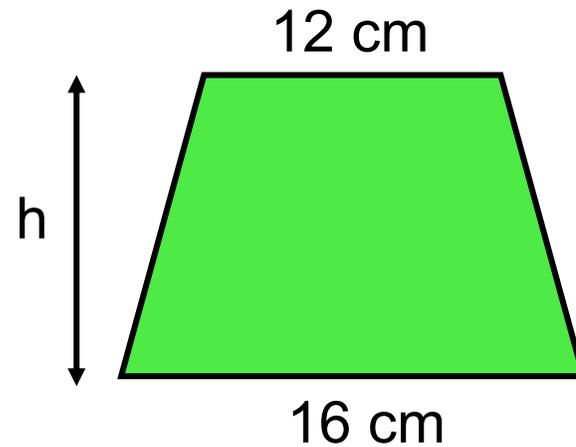
h = 12 cm

How many integers can you choose for a, b & h so that the trapezium has an area of 9 m².

b

h

a

8 ways

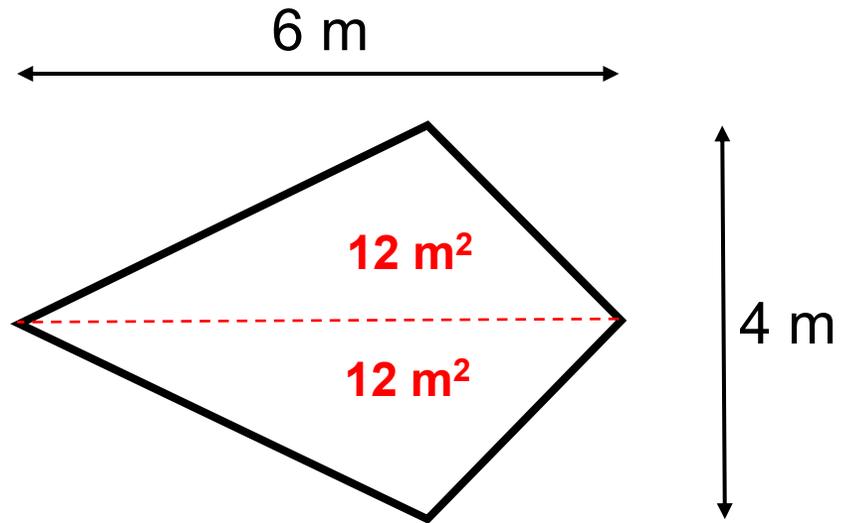| h	a	b
3	1	1
2	1	2
2	2	1
1	1	5
1	2	4
1	3	3
1	4	2
1	5	1

Other Quadrilaterals

How would you find the area of this **kite**?

6 m

4 m

Solution

How would you find the area of this **kite**?

6 m

12 m²

12 m²

4 m
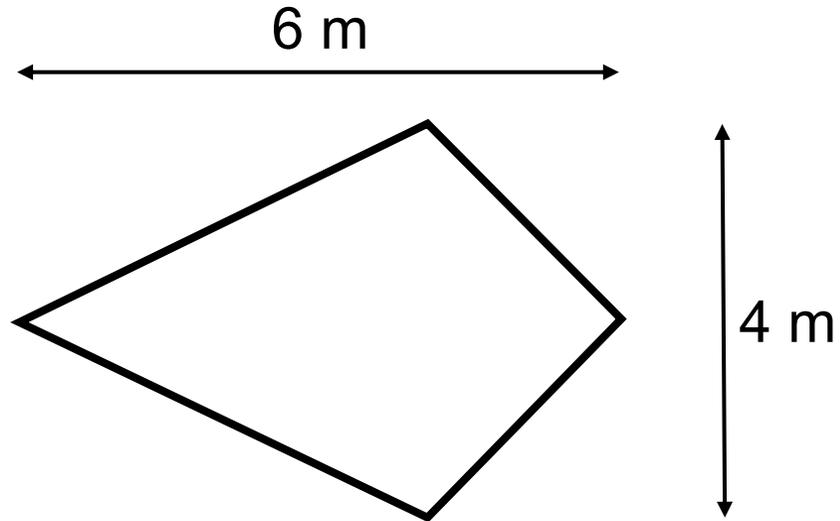
Area = 12 + 12 = <u>24 m²</u>

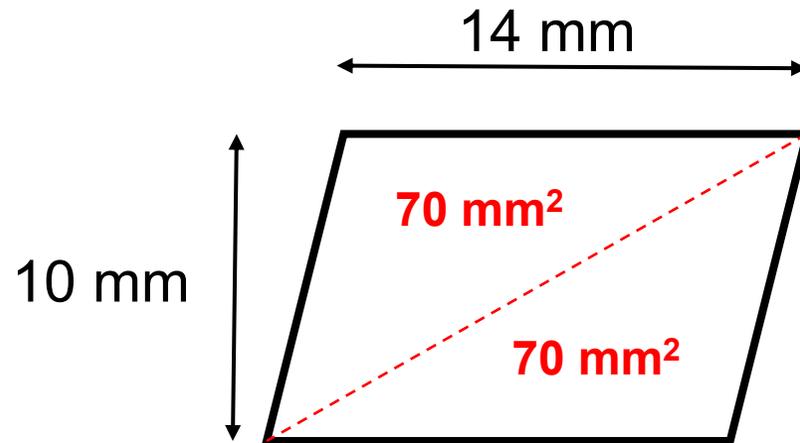# Other Quadrilaterals

How would you find the area of this **parallelogram**?

14 mm

10 mm

Solution

How would you find the area of this **parallelogram**?
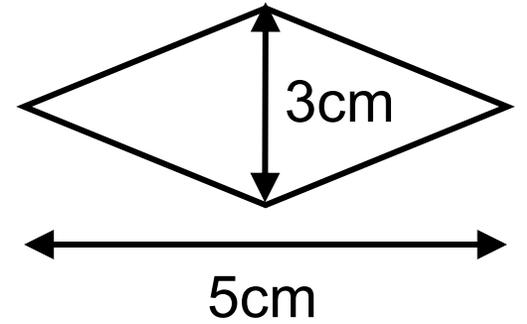
14 mm

70 mm^2

10 mm

70 mm^2
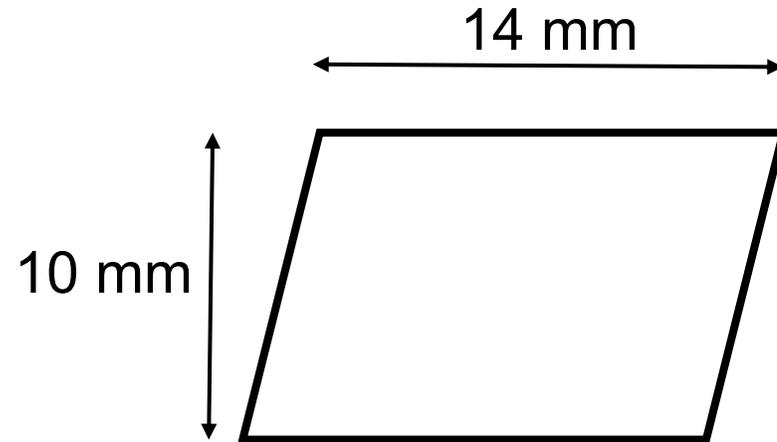
Area = 70 + 70 = <u>140 m^2</u>

Exercise

Find the area of these shapes.
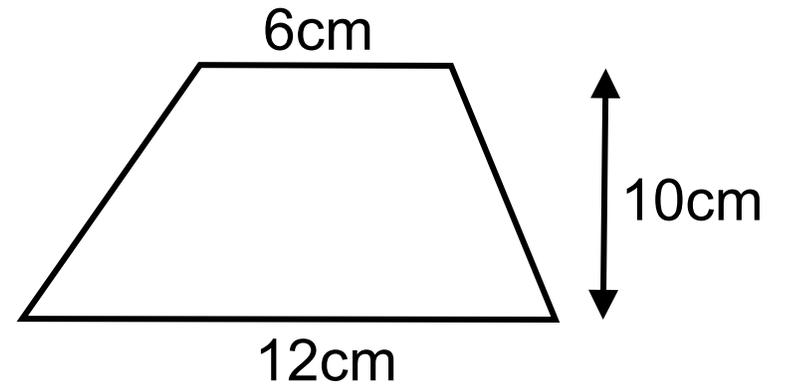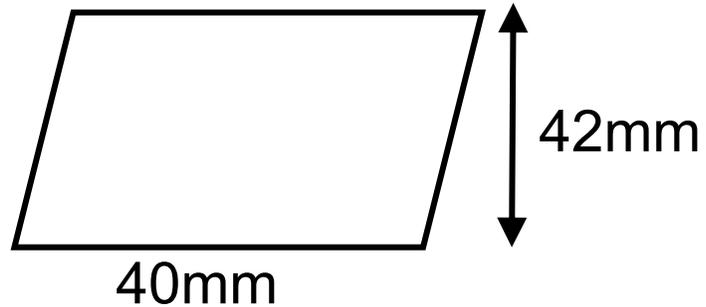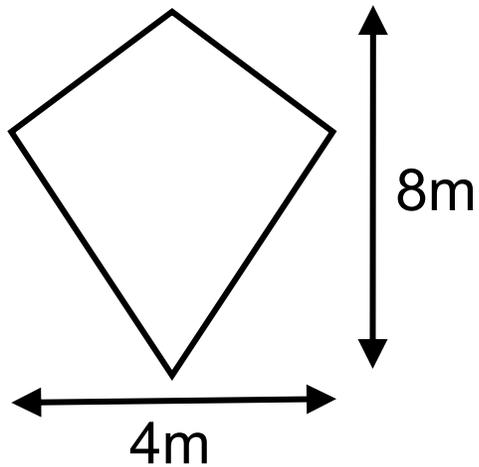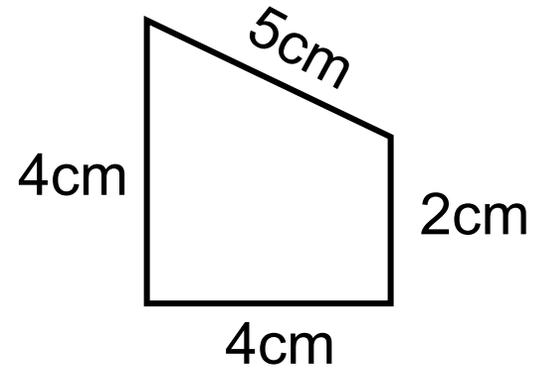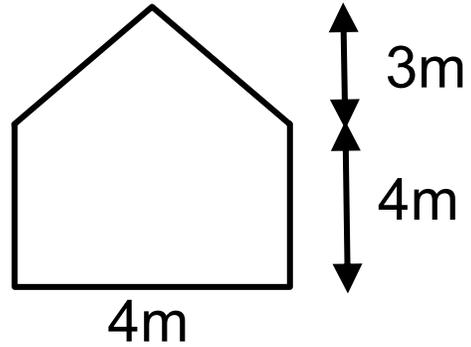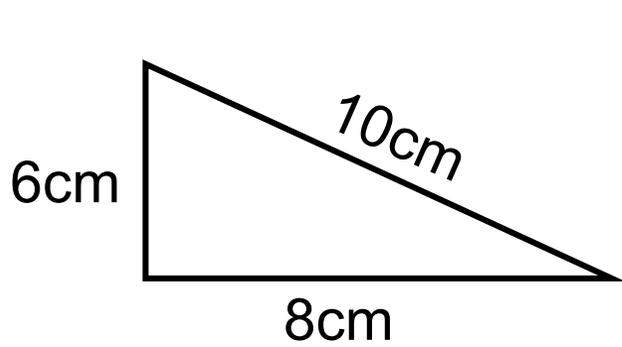
Solutions

Find the area of these shapes.

24cm²

6cm 10cm 8cm

22m²

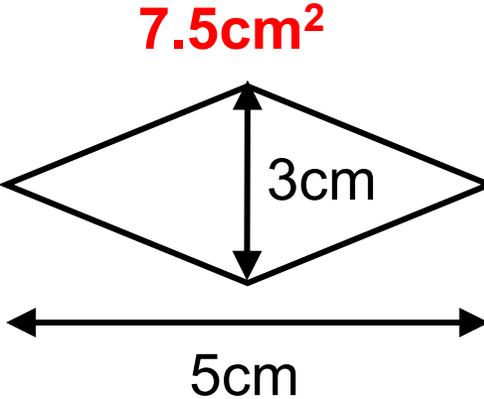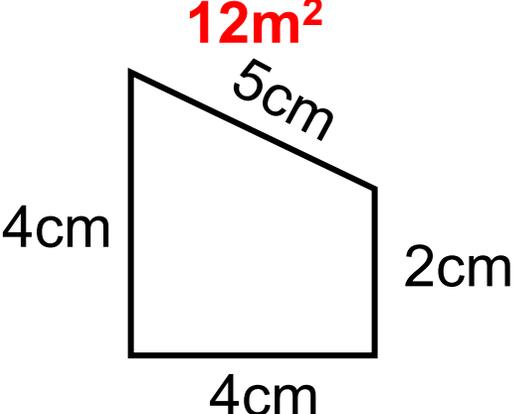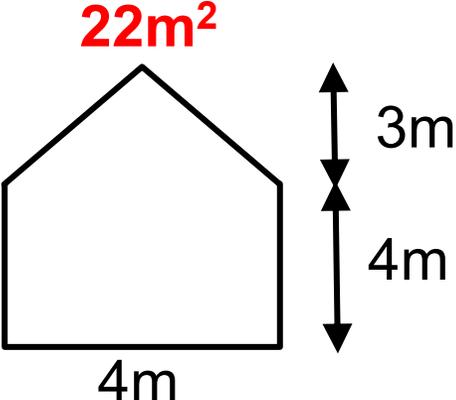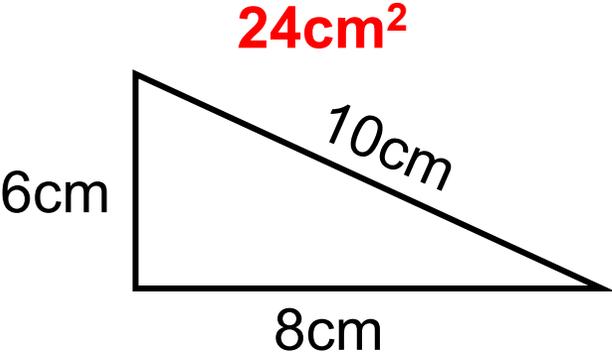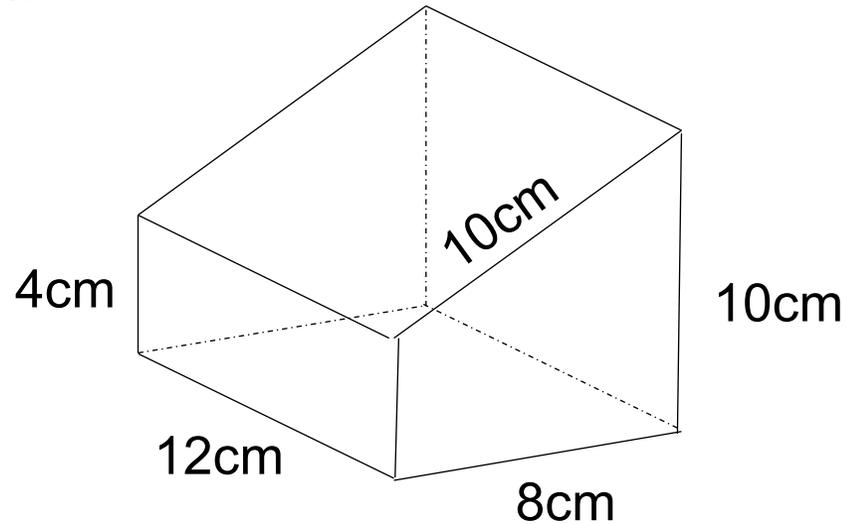3m 4m 4m

12m²

5cm 4cm 2cm 4cm

7.5cm²

3cm 5cm

16m²

8m 4m

1680mm²

42mm 40mm

90cm²

6cm 10cm 12cm
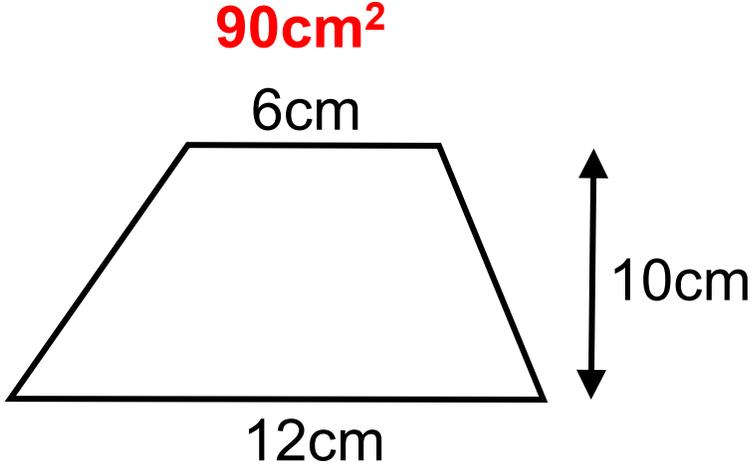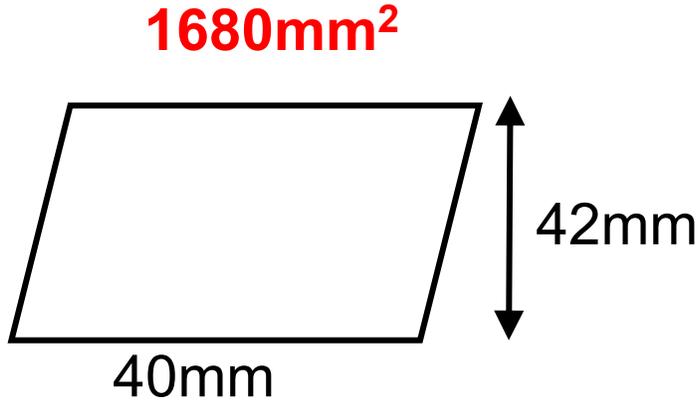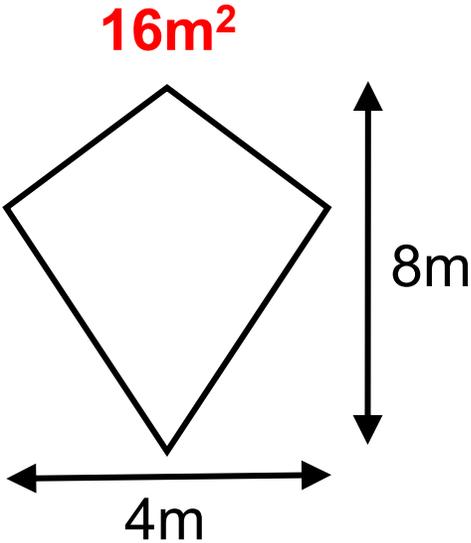
Extension

Here is a trapezoidal prism.

4cm

10cm

10cm

12cm

8cm
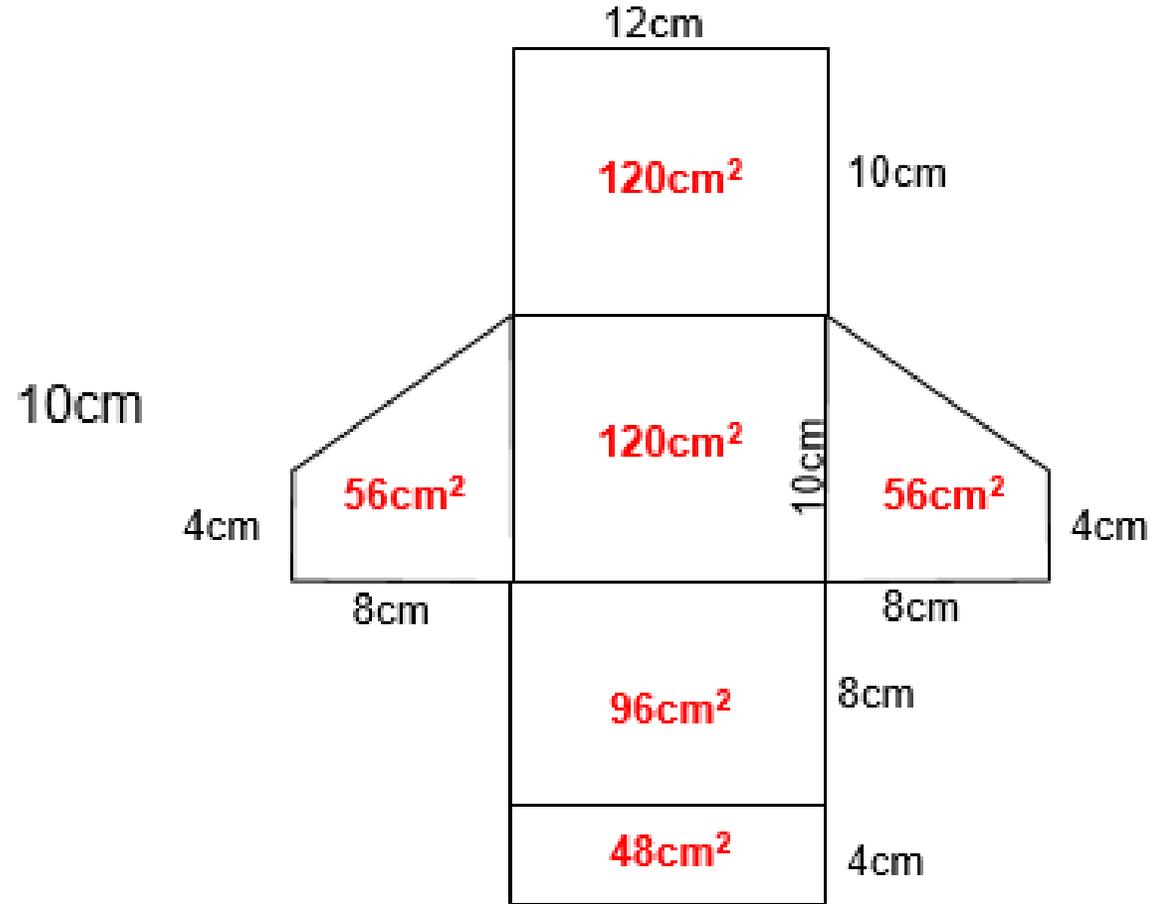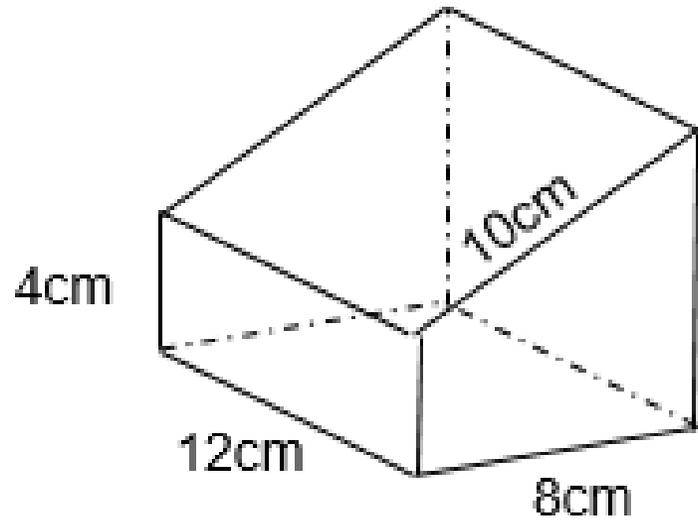
The surface area of a solid is the sum of the areas of all of the faces.
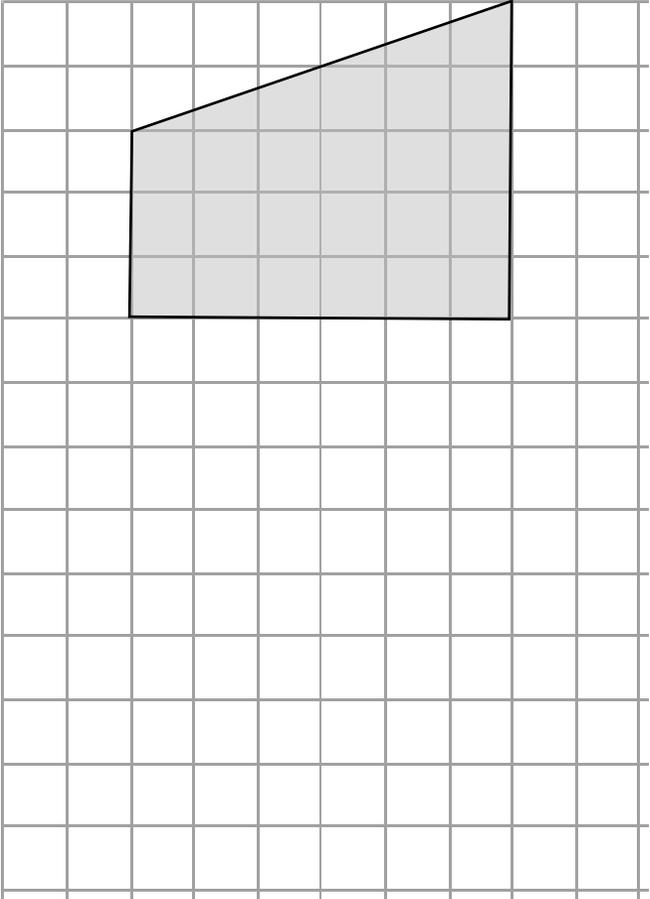
Find the surface area of the trapezoidal prism.

Solution

12cm

10cm

4cm

12cm

8cm

10cm

120cm²

10cm

56cm²

4cm

8cm

120cm²

10cm

56cm²
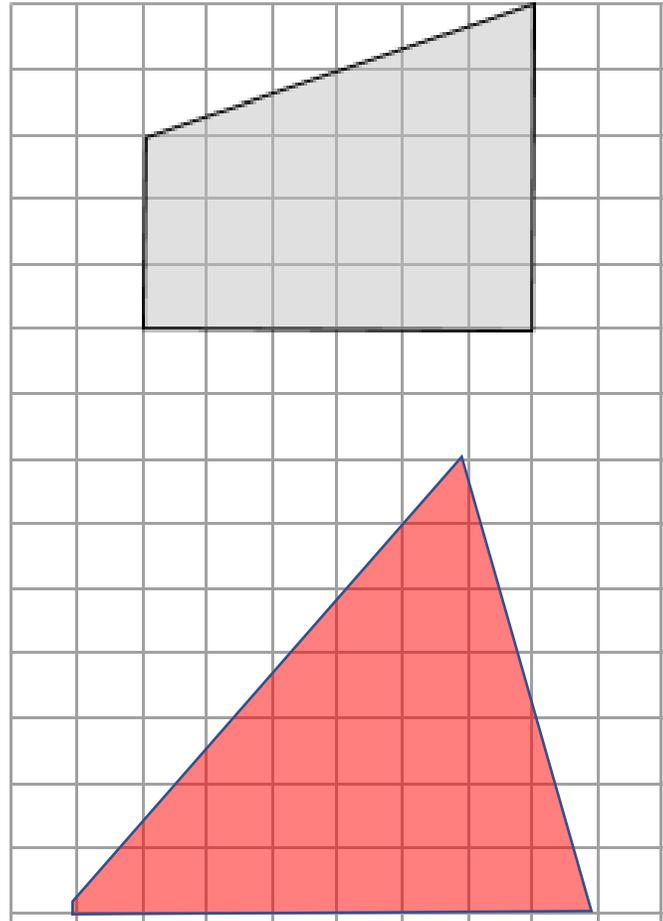
4cm

8cm

96cm²

8cm

48cm²

4cm

Surface Area = 496 cm²

Here is a trapezium drawn on a centimeter grid.

On the grid, draw a triangle equal in area to the trapezium.

Here is a trapezium drawn on a centimeter grid.

On the grid, draw a triangle equal in area to the trapezium.