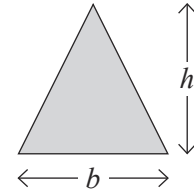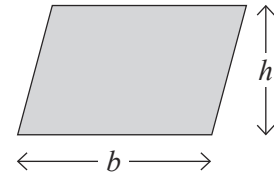# Area of a Trapezium **Answers**

1. What is the formula for the area (A) of a triangle with base b and height h?
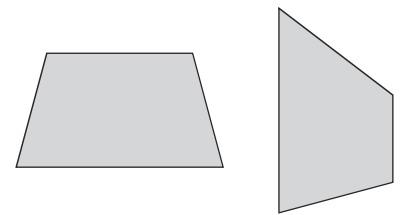
   $A = \dfrac{1}{2}bh$

2. What is the formula for the area (A) of a parallelogram with base b and height h?

   $A = bh$

3. These shapes are trapeziums: What properties do they have that make them trapeziums?

   A trapezium is a quadrilateral with two parallel sides.

4. Draw a diagonal in this trapezium. This splits the trapezium into 2 triangles; the sum of the areas of the triangles is equal to the area of the trapezium. Using this fact, write an expression, in terms of h, a and b for the area of the trapezium.

   Area $= \dfrac{1}{2}bh + \dfrac{1}{2}ah$
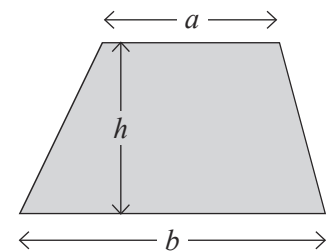
5. When this trapezium is rotated through 180°, it is possible to place the image either to the right or left of the original trapezium so that the two fit together. Draw the image to show this. (You may wish to use tracing paper to help you.)

   What shape have you produced by putting the two shapes together in this way? Write a formula for the area of the shape that you have produced, in terms of a, b and h.

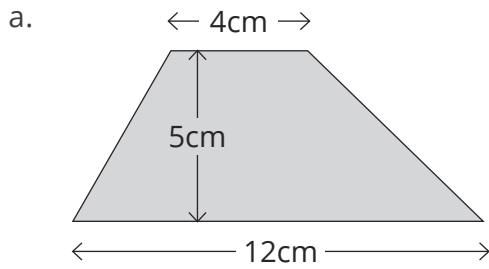   **A parallelogram**

   Area $= (a + b)h$
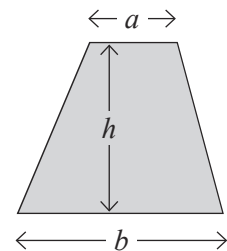
What is the relationship between the area of the shape that you have produced and the area of the trapezium? Use the formula that you found for the area of the compound shape to give a formula for the area of a trapezium.
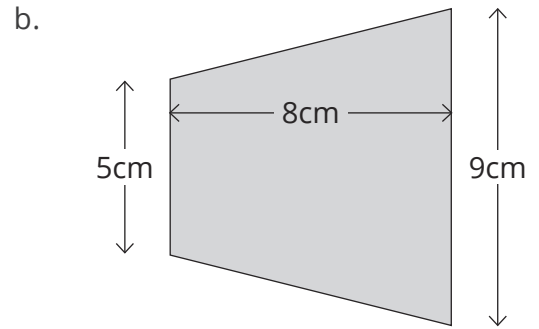
The area of my shape is double the area of the trapezium.
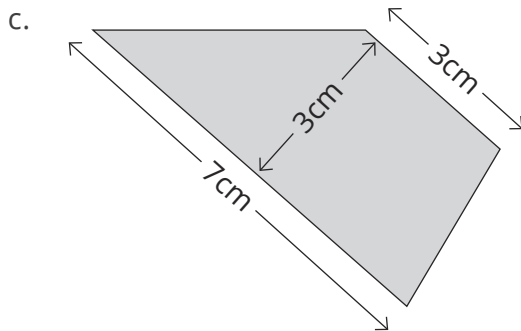
Area of trapezium = $\dfrac{(a + b)h}{2}$
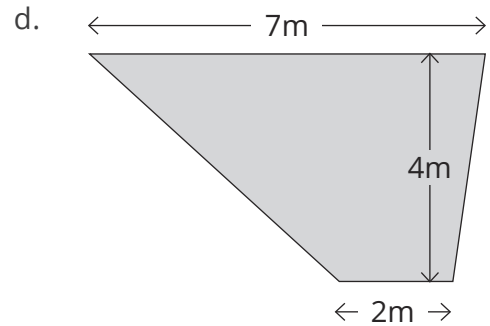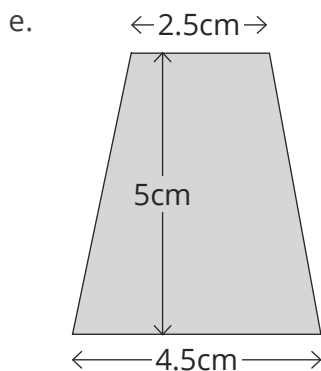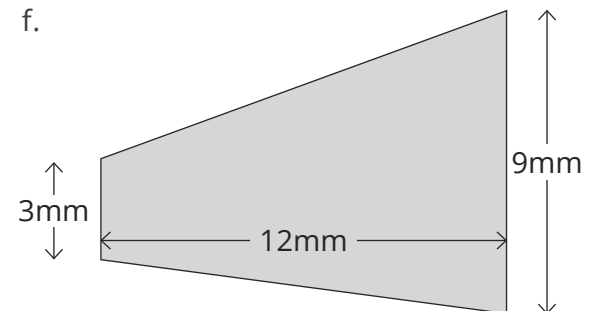
6. Find the area of each trapezium:

a.

40cm²

b.

56cm²

c.

15cm²

d.

18m²

e.

17.5cm²

f.

72mm²

g.

8mm

1cm

7mm

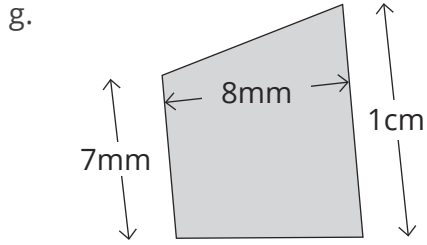**68mm²**

h.
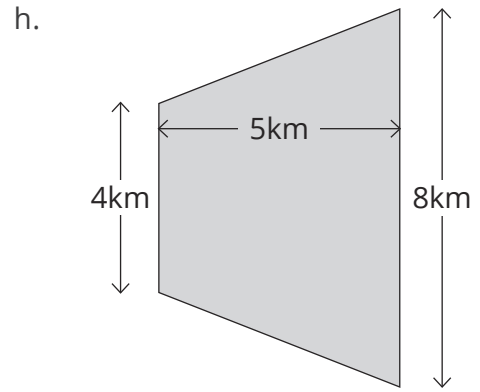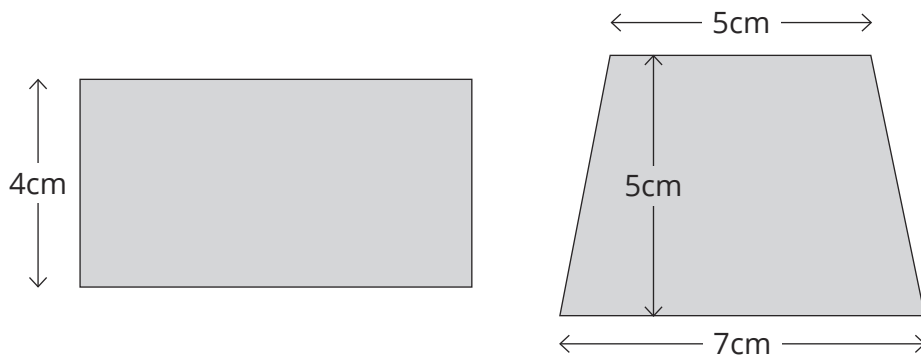

5km

4km

8km

30km²

7. By measuring the sides, find the area of this trapezium.

$\frac{(6 + 8)4}{2}$ **= 28cm²**

8. This rectangle and trapezium both have the same area. What is the length of the rectangle?

4cm

5cm

5cm

7cm

7.5cm

9. A farmer's field is the shape of a trapezium. The parallel sides are 60m and 250m long. The perpendicular distance between the parallel sides is 400m. The farmer needs $1200m^2$ of space per cow in the field. What is the largest number of cows that he should have in the field?
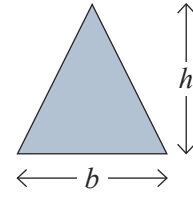
   Area = 62 000m^2

   51 cows

10. A trapezium has parallel sides of length 8cm and 4cm. Its area is $60cm^2$. What is the perpendicular distance between the parallel sides?
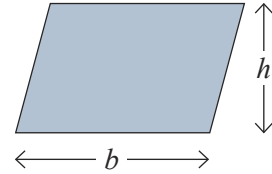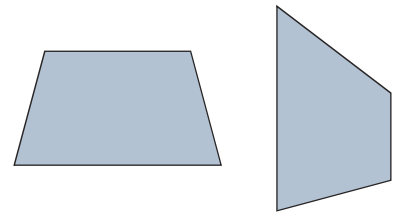
    10cm

Area of a Trapezium

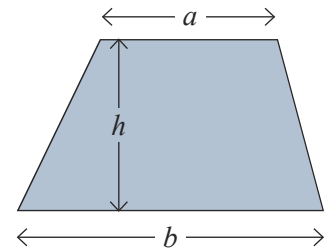1. What is the formula for the area (A) of a triangle with base b and height h?

   _____

2. What is the formula for the area (A) of a parallelogram with base b and height h?

   _____

3. These shapes are trapeziums: What properties do they have that make them trapeziums?
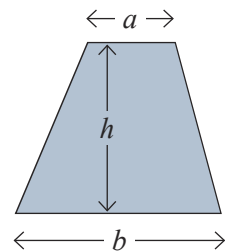
   _____

4. Draw a diagonal in this trapezium. This splits the trapezium into 2 triangles; the sum of the areas of the triangles is equal to the area of the trapezium. Using this fact, write an expression, in terms of h, a and b for the area of the trapezium.

   _____

5. When this trapezium is rotated through 180°, it is possible to place the image either to the right or left of the original trapezium so that the two fit together. Draw the image to show this. (You may wish to use tracing paper to help you.)
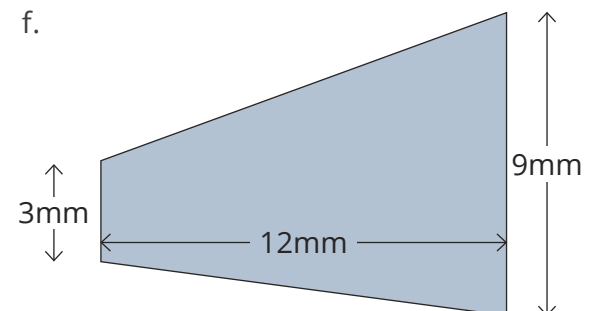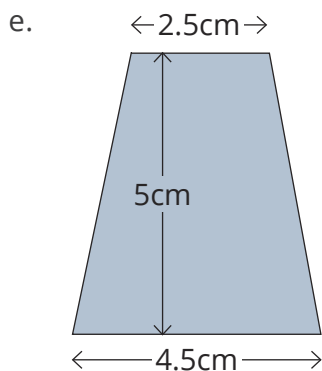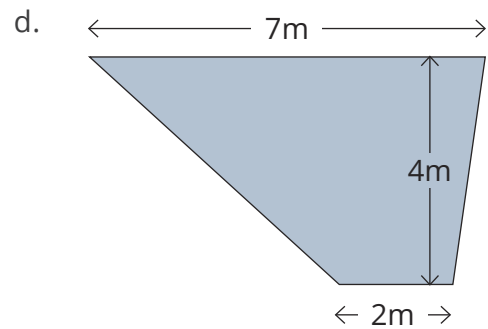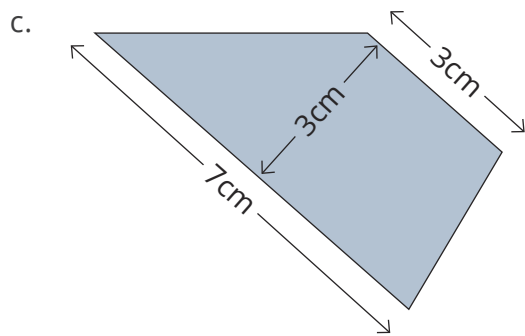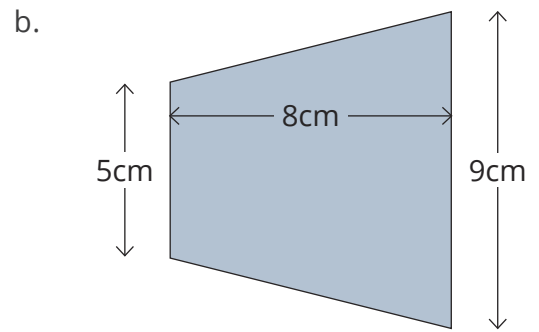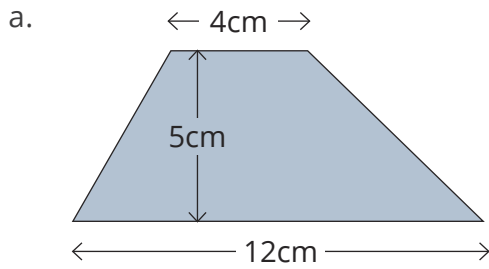
   What shape have you produced by putting the two shapes together in this way? Write a formula for the area of the shape that you have produced, in terms of a, b and h.
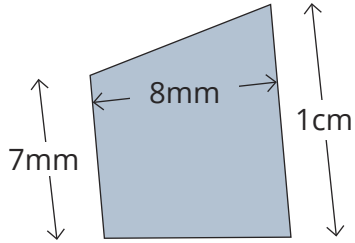
   _____

   _____

What is the relationship between the area of the shape that you have produced and the area of the trapezium? Use the formula that you found for the area of the compound shape to give a formula for the area of a trapezium.
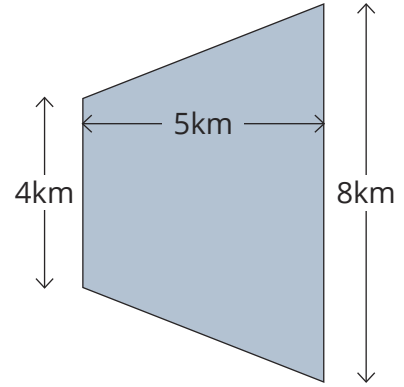
_____

_____

6. Find the area of each trapezium:

a.

← 4cm →

5cm

← 12cm →

_____

b.

8cm

5cm

9cm

_____

c.

3cm

3cm

7cm

_____

d.

← 7m →

4m

← 2m →

_____

e.

←2.5cm→

5cm

←4.5cm→

_____

f.

3mm

12mm

9mm

_____

g.

8mm

1cm

7mm

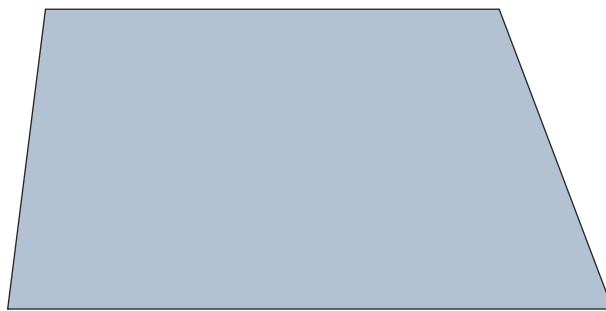_____
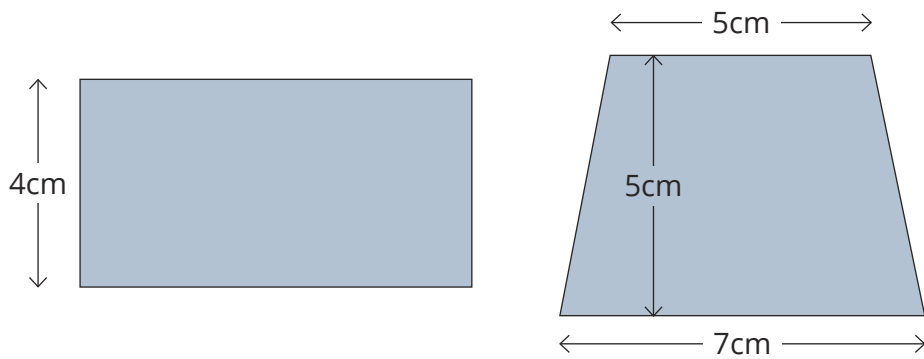
h.

5km

4km

8km

_____

7. By measuring the sides, find the area of this trapezium.

_____

8. This rectangle and trapezium both have the same area. What is the length of the rectangle?

4cm

5cm

5cm

7cm

_____

9. A farmer's field is the shape of a trapezium. The parallel sides are 60m and 250m long. The perpendicular distance between the parallel sides is 400m. The farmer needs 1200m^2 of space per cow in the field. What is the largest number of cows that he should have in the field?

_____

_____

10. A trapezium has parallel sides of length 8cm and 4cm. Its area is 60cm^2. What is the perpendicular distance between the parallel sides?

_____

_____