

Area of a right-angled triangle

Notes and guidance

In this small step, children look in more detail at finding the areas of right-angled triangles.

Children move on from counting squares to identifying and using a formula. They explore the fact that a right-angled triangle with the same length and perpendicular height as a rectangle has an area that is half the area of the rectangle. They then adapt the formula for the area of a rectangle to find the area of a right-angled triangle. Children use the formula $\text{area} = \frac{1}{2} \times \text{base} \times \text{perpendicular height}$ rather than $\frac{1}{2} \times \text{length} \times \text{width}$ in readiness for the next step, where they look at non-right-angled triangles. This vocabulary should be explored and children should be confident identifying the correct parts of the triangle.

Things to look out for

- Children may not identify that a rectangle can be made into two right-angled triangles.
- Children may not be able to identify the base and perpendicular height, choosing the incorrect measurements to multiply.
- Children may not associate multiplying by $\frac{1}{2}$ with dividing by 2

Key questions

- How can you split the rectangle into two right-angled triangles?
- What do you notice about the two triangles?
- What do you notice about finding the area of a rectangle and finding the area of a right-angled triangle?
- What is the formula to find the area of a right-angled triangle?
- What does “perpendicular” mean?
- How do you know which measurement is the base/perpendicular height?

Possible sentence stems

- The area of the right-angled triangle is _____ the area of the rectangle.
- The formula for the area of a triangle is ...

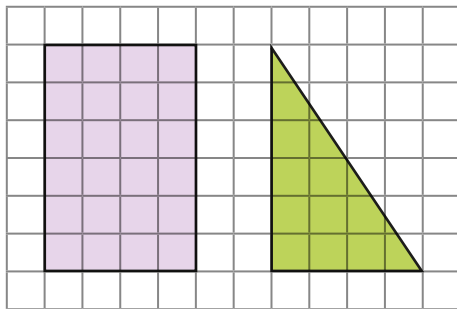
National Curriculum links

- Recognise when it is possible to use formulae for area and volume of shapes
- Calculate the area of parallelograms and triangles

Area of a right-angled triangle

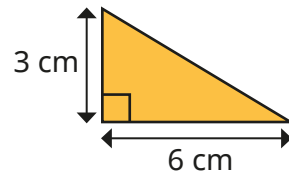
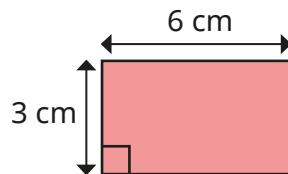
Key learning

- Here is a rectangle and a right-angled triangle.



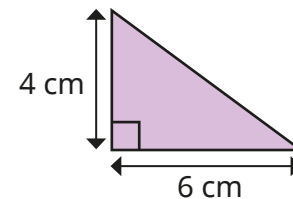
- ▶ What is the area of the rectangle?
- ▶ What is the area of the right-angled triangle?
- ▶ What do you notice?

- Here is a rectangle and a triangle.



- ▶ What is the area of the rectangle?
- ▶ What is the area of the triangle?
- ▶ How do you work out the area of a right-angled triangle?

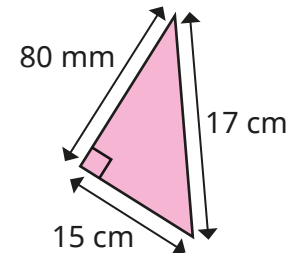
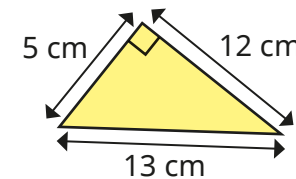
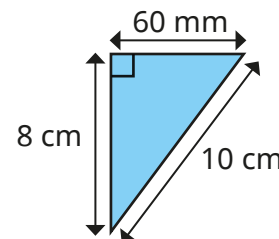
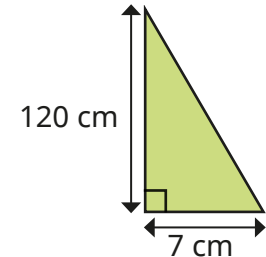
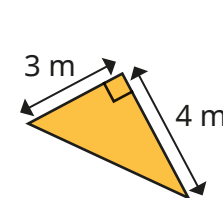
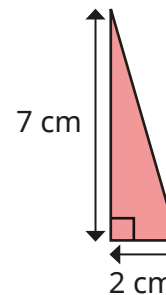
- Scott uses the formula to work out the area of this right-angled triangle.



$$\text{area} = \frac{1}{2} \times \text{base} \times \text{perpendicular height}$$

$$\text{area} = \frac{1}{2} \times 6 \times 4 = \frac{1}{2} \times 24 = 12 \text{ cm}^2$$

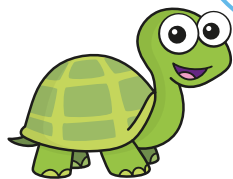
Use the formula to find the areas of the triangles.



Area of a right-angled triangle

Reasoning and problem solving

Tiny is working out the area of a right-angled triangle.



I only need to know the lengths of any two sides to work out the area of a triangle.

Do you agree with Tiny?
Explain your answer.

No

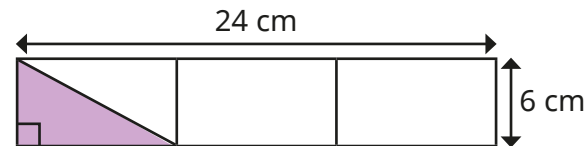
The area of a right-angled triangle is 54 cm^2

What could the base and height be?

How many solutions can you find?

multiple possible answers, e.g. 18 cm and 6 cm

Calculate the area of the shaded triangle.



Compare methods with a partner.

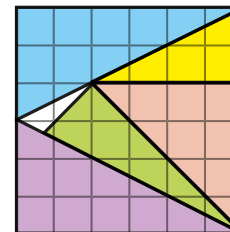
24 cm^2

Aisha has placed five right-angled triangles onto a square.

The total area of the square is 36 cm^2

1 cm^2 is not covered by a triangle.

What is the area of the green triangle?



5 cm^2