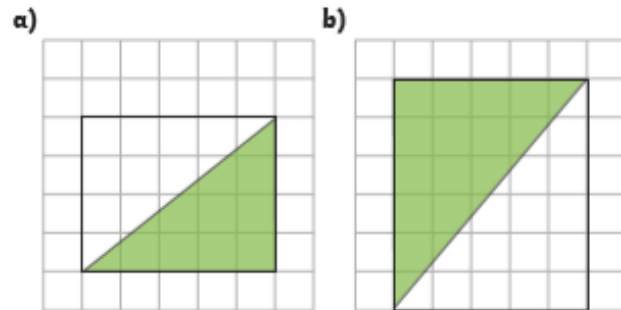1) Each of these rectangles has been split into two right-angled triangles. Firstly, find the area of the whole rectangles.
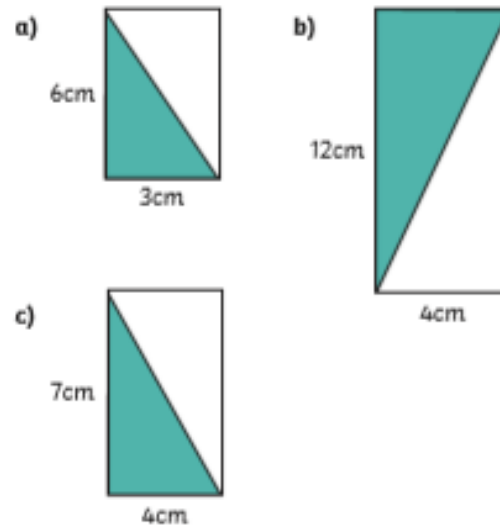
a)

b)

*Not to scale

2) Now estimate the area of the shaded right-angled triangle that is inside each rectangle.

What do you notice about the area of the triangle compared to the area of the rectangle?

3) Calculate the area of each of the shaded right-angles triangles by working out the area of the complete rectangle then dividing it by _____.

a)

6cm

3cm

b)

12cm

4cm

c)

7cm

4cm

4) Calculate the area of each triangle by using the formula base × height ÷ 2.

a)

3cm

8cm

b)

20mm

10cm

c)

16cm

40mm
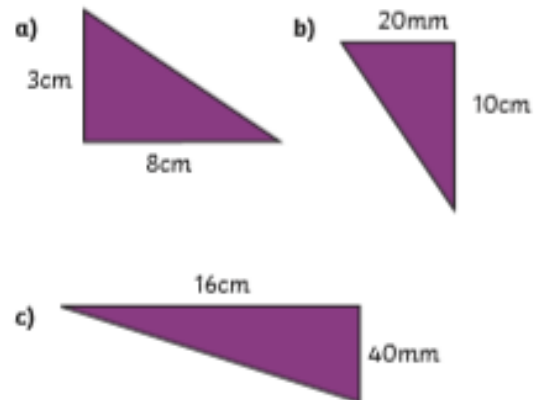
1) Elena and Dylan are working out the area of this right-angled triangle.

7cm

6cm

5cm
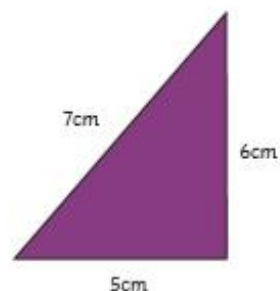
I worked out the area of the triangle using the measurements 5cm and 7cm.

I found the area was 17.5cm².

I used different measurements to Elena. I used 5cm and 6cm to work out the area of the triangle.

I found the area was 15cm²

Which answer is correct? Explain why.
If you are stuck could you try forming a rectangle from the triangle to investigate which statement is correct?

2) Only one of these calculations will correctly give the area of this triangle.

Write the correct calculation and explain the errors made in the other two calculations.
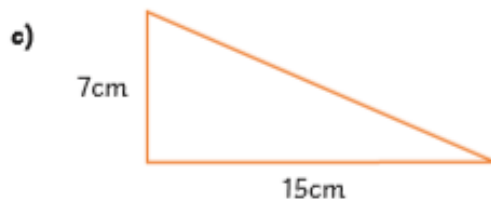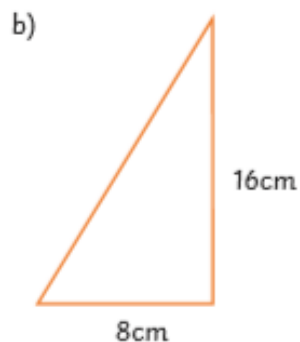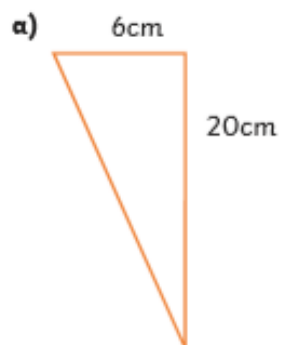
60mm

8cm
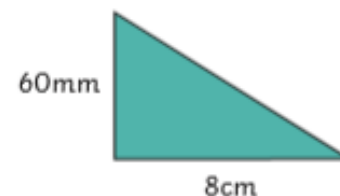
a) $8 \times 6 = 48cm^2$

b) $8 \times 6 \div 2 = 24cm^2$

c) $8 \times 60 \div 2 = 240cm^2$

1) This rectilinear shape has an area of 256cm². It has been split equally into four right-angled triangles.

a) 6cm / 20cm

b) 16cm / 8cm

c) 7cm / 15cm

2) Investigate finding other possible measurements one of the triangles taken from the rectangle could have had.

Use only whole-number length and height measurements.

3) I'm thinking of a right-angled triangle with integer side lengths.

It has an area of 24 cm².

Its base measures between 3cm and 8 cm.

Its height measures between 10cm and 25cm.

Give the dimensions of all the possible triangles I could be thinking of.

ANSWERS

1) a) $20cm^2$

   b) $30cm^2$

2) a) $10cm^2$

   b) $15cm^2$

   The area of the triangle is half of the area of the rectangle.

3) Calculate the area of each of the shaded right-angles triangles by working out the area of the complete rectangle then dividing it by **2**.

   a) Area of rectangle = $18cm^2$
      Area of triangle = $9cm^2$
   b) Area of rectangle = $48cm^2$
      Area of triangle = $24cm^2$
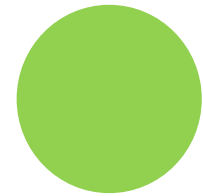   c) Area of rectangle = $28cm^2$
      Area of triangle = $14cm^2$

4) a) Area of triangle = $12cm^2$
   b) Area of triangle = $10cm^2$
   c) Area of triangle = $32cm^2$

1) Dylan has the correct calculation as he has multiplied the base by the perpendicular height before dividing by 2.

   Elena has incorrectly multiplied the base by the longest side (the hypotenuse) instead of by the perpendicular height, before dividing by 2.

2) a) Incorrect as the 48 should be divided by 2.
   b) This is the correct answer.
   c) Incorrect as the 60mm should have been converted to 6cm.

1) Each triangle within the rectangle has a value of $64cm^2$ ($256cm^2 \div 4 = 64cm^2$).
   Therefore only Triangle b could have come from the rectangle as it has an area of $64cm^2$
   ($16 \times 8 \div 2 = 64cm^2$).

As the triangle must have an area of $64cm^2$ then the triangle could have the following side lengths:
   16cm x 8cm has already been given
   1cm x 128cm
   2cm x 64cm
   4cm x 32cm

2) As the triangle has an area of $24cm^2$ then the triangle could have the following dimensions:
   Base = b and Height = h
   Triangle 1: b = 3cm and h = 16cm
   Triangle 2: b = 4cm and h = 12cm