

Learning for life

Measurement

m54w5

Substrand: Indirect Measurement

In the space provided write a convincing explanation of how you solved the problem. Remember to show clearly all the mathematics used. The answer alone is not enough!

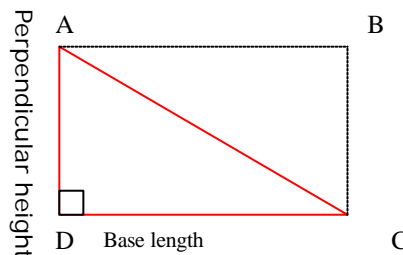
Areas of Triangles

To find the area of a triangle we need to understand that the triangle is half of a rectangle.

For example.

Background

The triangle ACD is half the size of the rectangle $ABCD$. Notice that the line segment AD is perpendicular to the line segment DC . That is because they meet to form an angle of 90 degrees.



To find the area of the rectangle ABCD

$\text{Area rectangle} = \text{length} \times \text{width}$ (or base \times perpendicular height in this case)

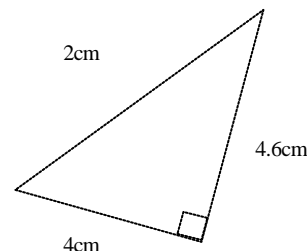
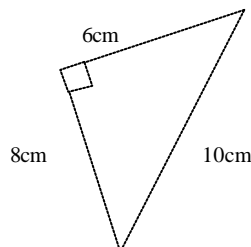
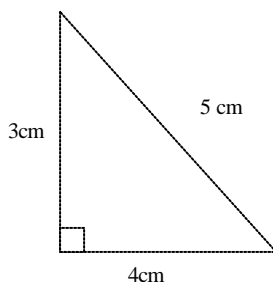
It stands to reason therefore that the area of the triangle is half that of the rectangle.

That is

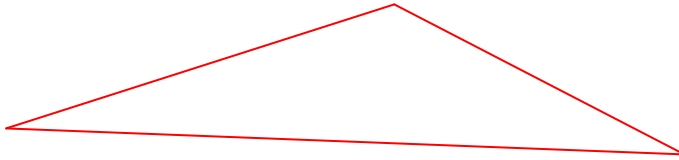
$\text{Area of a triangle is} = \frac{\text{Length of the Base} \times \text{Perpendicular Height}}{2}$

Task

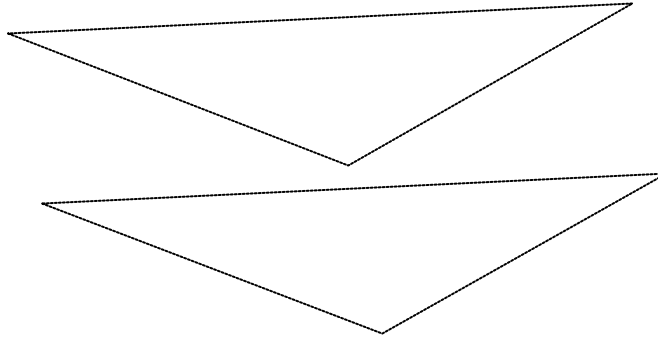
1. Find the area of the following right angled triangles.



2. The triangle below is not a right angled triangle. Explain why not.



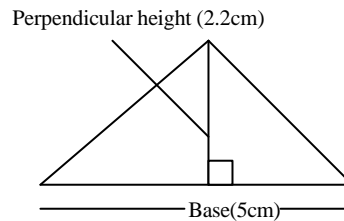
3. With the two identical (congruent) triangles below show that they can be joined to make one rectangle. You will need to trace the triangles and cut them out. Then one will have to be cut further so as you can rearrange the pieces to form a rectangle. Glue the rectangle on this page. What is the area of the rectangle? What is the area of the triangle?



4. You should have found that it is possible to form a rectangle. Is this true of all triangles? Draw a different triangle, trace it and prove that it is possible.

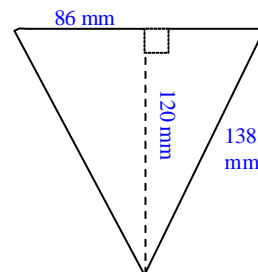
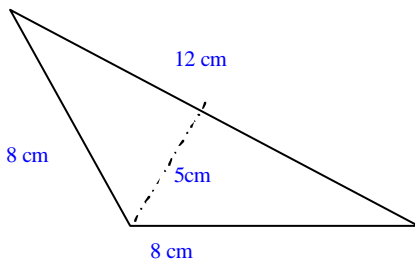
5. The area of any triangle can be found with the following formula.

Area of a triangle = $\frac{\text{base} \times \text{perpendicular height}}{2}$
 therefore $= \frac{5\text{cm} \times 2.2\text{cm}}{2}$
 $= 5.5\text{cm}^2$



(Note that the square pictured where the base meets the height indicates that the angle is 90°.)

Use the above formula and setting out to find the area of the following triangles.



Reflection:

- Write down some of the difficulties that you had to overcome to solve this problem.