**INVESTIGATION – Area of a Triangle**

**Objectives for the next two lessons:**

* Know the standard labelling of a triangle
* Derive a formula for the area of any triangle given two sides and the angle between them
* Practice finding the area of non-right triangles
1. This is how the sides and angles of a non-right triangle are labelled conventionally:



Write two statements describing the pattern of the A's and b's etc when a triangle is labelled in this way.

Statement 1:

Statement 2:

1. Label this triangle:

Write an expression for the area of this triangle:



A =

1. Using your knowledge of right-angled trigonometry in triangle on the left, write an expression for h:

h =

 

1. Using your expression for h developed above, write an expression for the area of this triangle:

A =

1. By considering the other two possible **heights** of this triangle, write two other expressions for the area of this triangle.

A2 =

A3 =

1. Now write one big equation that shows that each of the three expressions for the **area of the triangle** is equal to each of the others:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A1 | = | A2 | = | A3 |
|  | = |  | = |  |