**Lesson 2**

**GCSE Mathematics**

**Non-Right Angled Trigonometry**

## 2.1 Relationships

Mathematicians write; $sin^2 x$ when they mean $(sin\, x)^2$

$cos^2 x$ when they mean $(cos\, x)^2$

$tan^2 x$ when they mean $(tan\, x)^2$

Fill in the table below, using your calculator and working to three decimal places.

| | $sin\, x$ | $cos\, x$ | $tan\, x$ | $sin^2 x$ | $cos^2 x$ | $\frac{sin\, x}{cos\, x}$ | $cos^2 x + sin^2 x$ |
|---|---|---|---|---|---|---|---|
| 0° | | | | | | | |
| 10° | | | | | | | |
| 20° | | | | | | | |
| 30° | | | | | | | |
| 40° | | | | | | | |
| 50° | | | | | | | |
| 60° | | | | | | | |
| 70° | | | | | | | |
| 80° | | | | | | | |
| 90° | | | | | | | |

Looking over your table of results, can you spot two interesting relationships ?
One "always true formula" involves sin $x$, $\cos x$ and $\tan x$.
Write it down here:

The other involves $\cos^2 x$, the number 1, and $\sin^2 x$.
Write it down here:

Check that your “always true formulae” (that will be true no matter what the value of $x$ is, work for the example of when $x = 35°$.
Show your working here;

These two “always true formulae” are examples of trigonometric identities. Unlike an equation which is typically only true for one or two values of $x$ (and solving an equation is about finding those special values of $x$) an identity is true for all (or almost all as division by zero is not allowed, for example) values of $x$.