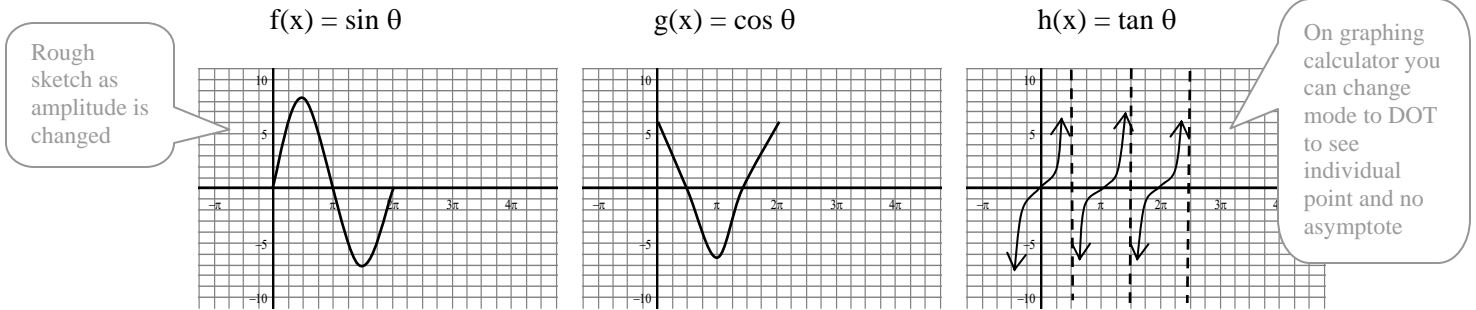
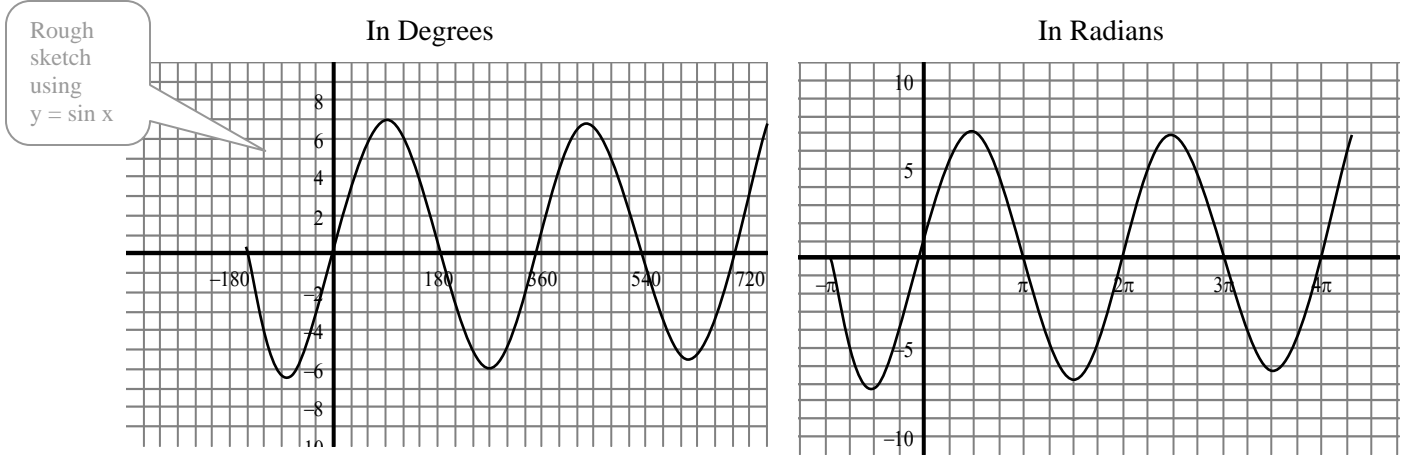


## 5.6 – Sketching the Basic Trigonometric Functions

Using the chart (table of values) that is generated from the “Unit Circle” one can plot and sketch the basic trigonometric functions (see following investigation sheet);



The “unit circle” provided values for one rotation ( $0^\circ \leq \theta \leq 360^\circ$ ) but one could keep rotating the radial arm to generate a repeating pattern for any angle.



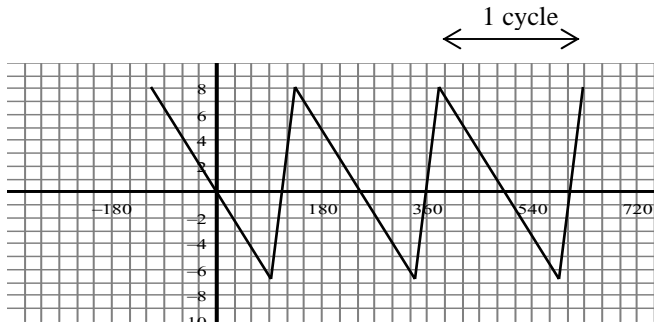
This generates a **Periodic Function**, which is defined as pattern of y-values that repeat at regular intervals. Some specific terminology associated with periodic behavior is outlined below.

**Cycle** describes one complete pattern (end up at the same y-value that started with)

**Period** describes the horizontal length (x-length) of one cycle

**Amplitude** is half the distance between the maximum (peak) and minimum (trough) values of the function.  $\text{Amplitude} = (\text{max} - \text{min})/2$

**Average** is the middle between max and min of the function.  $\text{Average} = \text{Min} + \text{Amplitude}$



$$\begin{aligned} \text{Period} &= 610 - 390 \\ &= 420 \end{aligned}$$

$$\begin{aligned} \text{Amplitude} &= (8 - -7)/2 \\ &= 7.5 \end{aligned}$$

$$\begin{aligned} \text{Average} &= -7 + 7.5 \\ &= 0.5 \end{aligned}$$

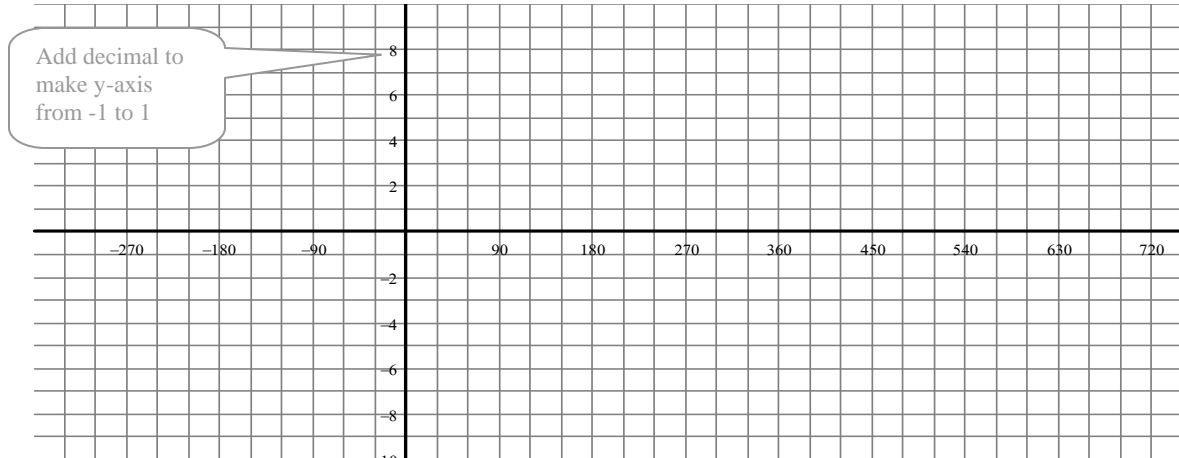
So function varies 7.5 above and below its average value

Apply these terms to describe the basic trigonometric functions on your sketches.

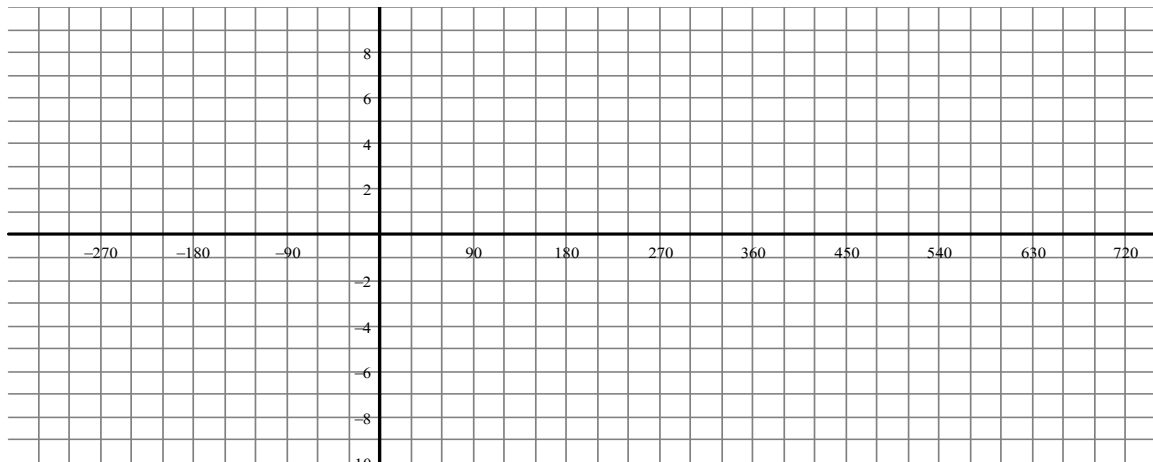
## 5.6 – Sketching the Basic Trigonometric Functions Investigation Sheet

Basic Trigonometric Functions using degrees

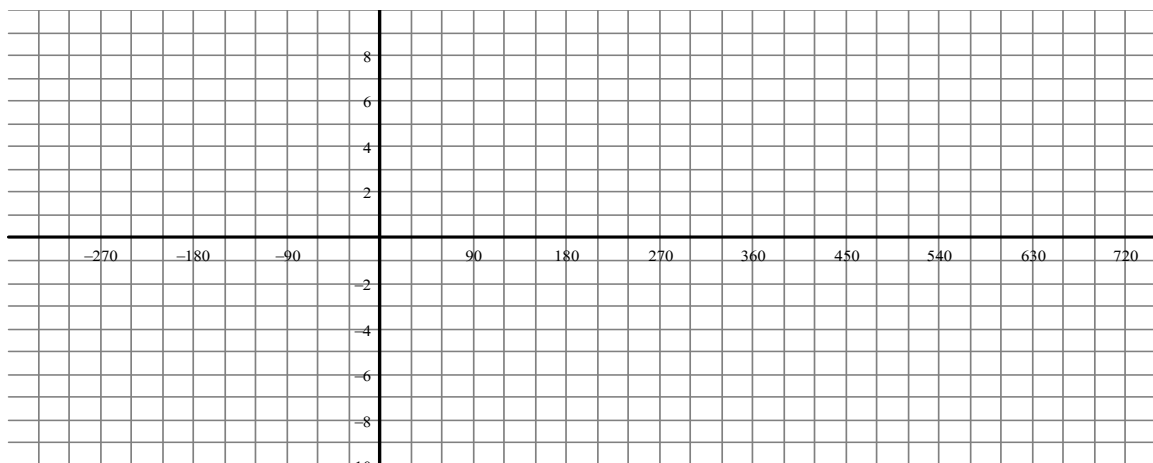
1)  $f(x) = \sin \theta$



2)  $g(x) = \cos \theta$



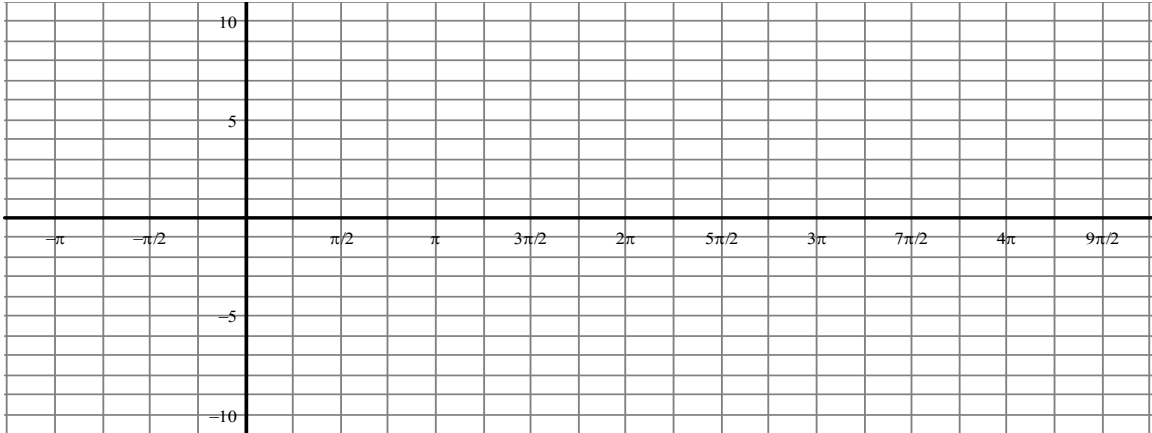
3)  $h(x) = \tan \theta$



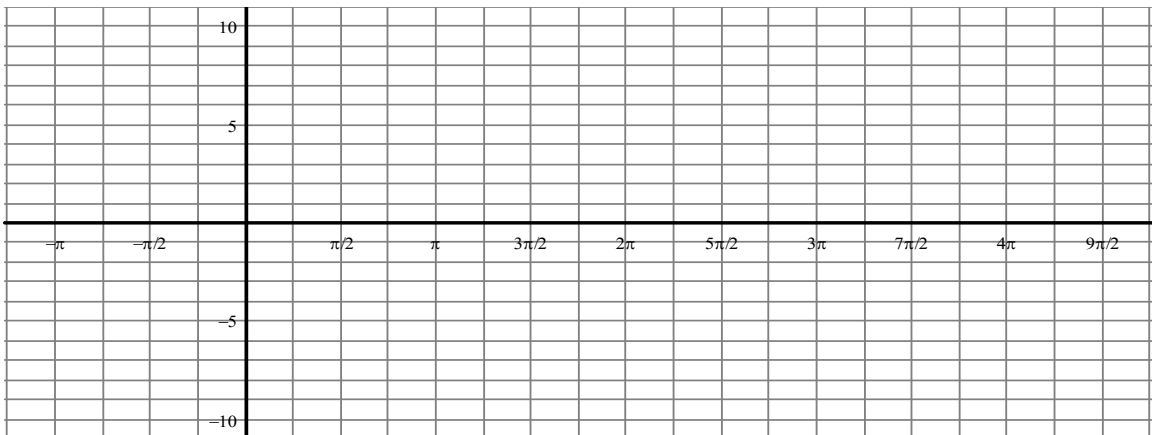
## 5.6 – Sketching the Basic Trigonometric Functions Investigation Sheet

Basic Trigonometric Functions using radians

1)  $f(x) = \sin x$



2)  $g(x) = \cos x$



3)  $h(x) = \tan x$

