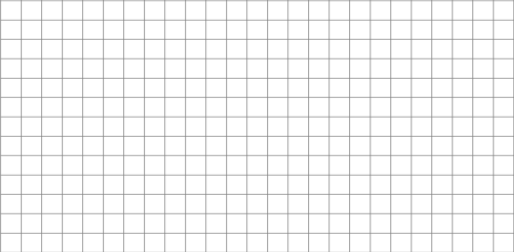
**5.2 – TRANSFORMATIONS OF SINUSOIDAL FUNCTIONS**

Examples:

Nothing changed except the centre line which is .

Amplitude :

Nothing changed except the amplitude which is now 3.

1.   
     
   **Note**: If was negative, there would also be a reflection around the centre line (the graph would “start” at a minimum).
2. A grid of white squares

   Description automatically generated

Centre line :

1. A grid of white squares

   Description automatically generated  
     
   **Note**: in each cycle, there are 4 easy points to plot (equidistant from one another): 1 max, 1 min and 2 *x*-intercepts. So, by dividing the period by 4, we know how “often” we are going to plot a point. That helps choosing our scale on the *x*-axis. In this example, dividing the period by 4 gives us . That’s how often we plotted a point.

Nothing changed except the period which is now .

Period : or

1. A grid of white squares

   Description automatically generated

Phase Shift :

The graph is shifted units to the right. We call it the **Phase Shift**.

**Note**: We need to choose our scale on the *x*-axis so that the phase shift (starting point from our cycle) is easy to plot. So, we need something in common with the 4 easy points previously considered. In radians a common denominator will be the easiest.   
Example:

**Combining all the transformations**:

1. A grid of white squares

   Description automatically generated
2. A grid of white squares

   Description automatically generated

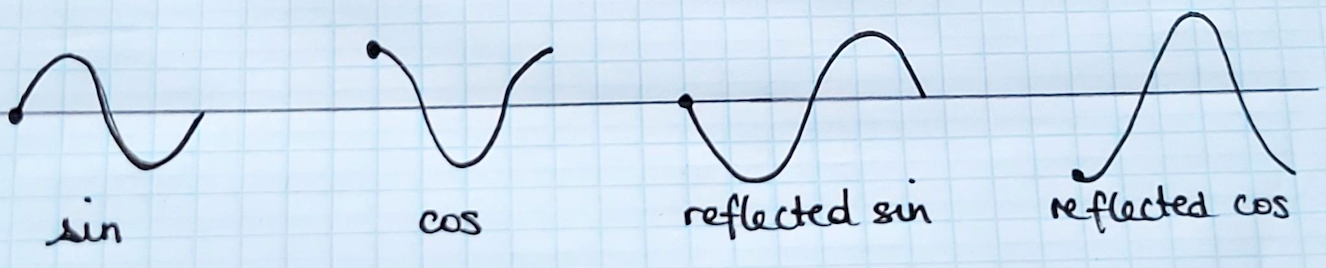
**Determining an equation from a graph:**

Example:

A graph of function in a grid

Description automatically generated

You can usually choose between a cos or a sin curve. The easiest is usually to pick the one that doesn’t involve a phase shift…



Your turn

A graph of a function

Description automatically generated

**Hwk: p 250 # 1acef, 2acf, 3, 5 – 7, 9, 13 – 17, 22, 24.**