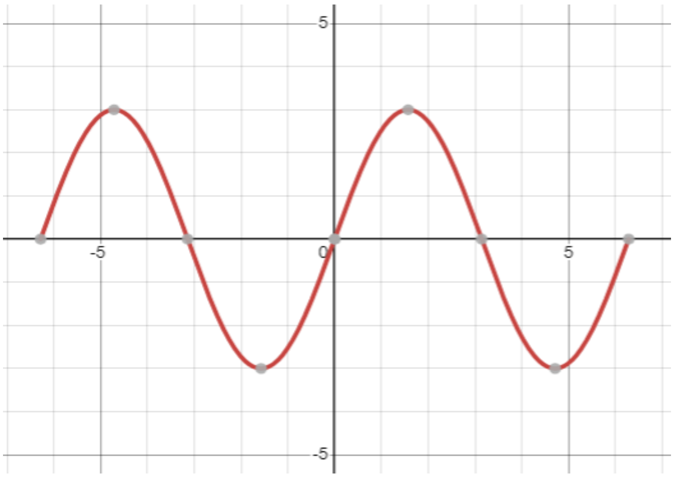
# Discussion Assignment 1

## #Question 1:

The graph of $y = sin\ x + cos\ x$ has a sinusoidal shape. Having two periodic functions (both cosine and sine) makes it a periodic function. Finally, the overall shape of this function oscillates between maximum and minimum values.

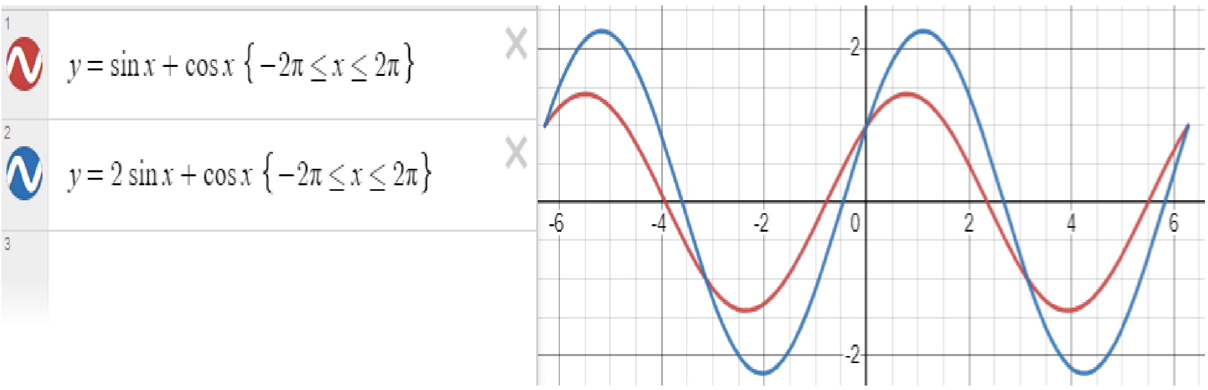
## #Question 2:

Below is the graph of $y = 3sinx$ for $-2\pi \leq x \leq 2\pi$.



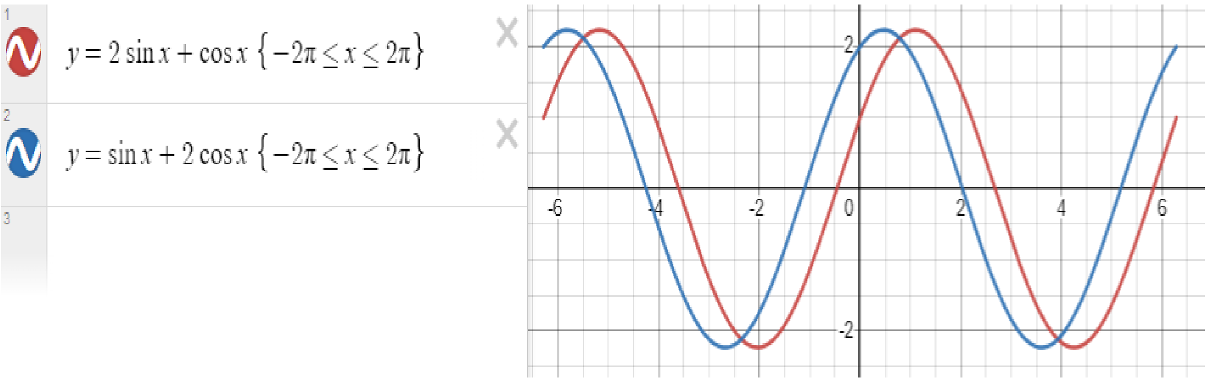

From the graph, maximum point occurs at $x = -2\pi$, $x = 2\pi$, and $y = 3$.

## #Question 3:



From the figure above, the graph for $y = 2sin\, x + cos\, x$, where $A = 2$ and $B = 1$, shows an elongated sinusoidal curve. The maximum point is shifted to a different x and y-values. Therefore, the maximum point has shifted to the right compared to the previous graph, when A and B were equal to 1.

**#Question 4:**




From the figure above, the graph for y = sin x + 2cos x, when A = 1 and B = 2, reveals another sinusoidal curve. The maximum point occurs at new x and y-values, which have shifted to the left compared to the previous graph, when A=2 and B=1.

**#Question 5:**

I discovered that switching A with B, and vice versa changes only the phase of the function, but not the amplitude. Therefore, changing A and B affect the position of the maximum point in the graph, altering its x-value. Nonetheless, despite the shifts, the maximum y-value remains constant for both cases. The relationship discovered when varying A and B moves the maximum point along the x-axis but maintain the same maximum y-value. This discovery shows that the maximum point of a function can be affected by coefficients even in a periodic function like $y = sin\, x + cos\, x$, but the highest y-value remains consistent irrespective of the shifts.