1. Find the Fourier series of a square function $f(t)$, $t \in [-T/2, T/2]$,

$$f(t) = \begin{cases} 1 & -T/2 < t < T/2 \\ 0 & \text{otherwise} \end{cases}$$

   using the basis $e^{2\pi int/T}$. Plot both the magnitude and phase of β_n versus n.

2. Draw (after finding the period and frequency) of the following functions: $\sin(3t)$, $\sin(\omega(t - t_0))$, $\cos(t)\cos(2t)$.