1. **Sinusoids and periodicity:** Just because it looks like a sine doesn’t make it periodic!

    (a) \( x(t) = \sin(t^2) \)

    (b) \( x[n] = \cos(7.7\pi n) \)

    (c) \( x[n] = \sin(5n) \)

2. **Integration!**

   We have represented a period function with period \( T_0 = 1/f_0 \):

   \[
   x(t) = X_0 + \Re\{\sum_{k=1}^{\infty} X_k e^{j2\pi kf_0t}\} \tag{1}
   \]

   We know that the coefficients can be found using the following equations:

   \[
   X_0 = \frac{1}{T_0} \int_0^{T_0} x(t)dt \tag{2}
   \]

   \[
   X_k = \frac{2}{T_0} \int_0^{T_0} x(t)e^{-j2\pi kt/T_0}dt \quad \text{for} \ k \neq 0 \tag{3}
   \]

   We will attempt to show why these analysis equations work!

   Evaluate the following integral in each of two cases:

   \[
   \int_0^{T_0} e^{j2\pi nf_0t}e^{-j2\pi mf_0t} dt
   \]

   (a) For \( n = m \):

   (b) For \( n \neq m \):

3. **More integration??!!**

   (a) \( \int |x|dx \)

   (b) \( \int te^{j2\pi ft}dt \)