EE 2000 Assignment # 1

(taken from Dr. Jingxian Wu, University of Arkansas, 2020.)

1. Perform even and odd decomposition of the following signals.

   (a) $s(t) = e^{\Omega_0 t}$

   (b) $s(t) = \begin{cases} \sin(2t+3), & t > 0, \\ 0, & \text{otherwise.} \end{cases}$

2. Are the following signals periodic? If so, find their periods.

   (a) $x(t) = \sin(\pi t/3) + 2\cos(8\pi t/3)$

   (b) $x(t) = \exp\left(j\frac{7\pi}{6}t\right) + \exp\left(\frac{5\pi}{6}t\right)$

   (c) $x(t) = 2\sin\left(\frac{3\pi}{8}t\right) + \cos\left(\frac{3}{4}t\right)$

3. Determine whether the following signals are power or energy signals or neither. Justify your answers.

   (a) $x(t) = A\sin(t), -\infty < t < \infty$

   (b) $x(t) = \exp[-at], a > 0, t > 0$

   (c) $x(t) = A\exp[bt], b > 0$

   (d) $x(t) = \exp[-(a+jb)t], a > 0, t > 0$