

ELEG 3124 Assignment # 1

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

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

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