Tutorial 1
Deterministic Signal Analysis

Problem 1 (Fourier Spectrum)

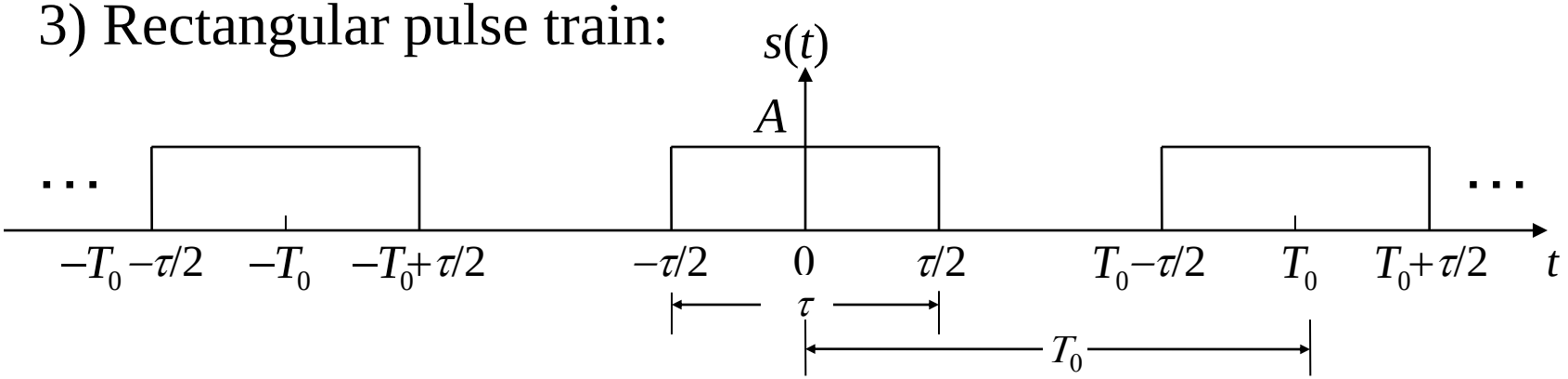
Derive the Fourier spectrum of the following signals:

1) Truncated sinusoidal signal: $s(t) = \begin{cases} A\cos 2\pi f_0 t & |t| \le \tau/2 \\ 0 & \text{elsewhere} \end{cases}$

where f_0 is an integer multiple of $1/\tau$.

2) Sinc-shaped pulse: $s(t) = A\text{sinc}(t/\tau)$

3) Rectangular pulse train:



Problem 2 (Energy/Power Spectrum)

Determine whether the signals given in Problem 1 are power-type or energy-type signals. For energy-type signals, determine the signal energy and the energy spectrum. For power-type signals, determine the signal power and the power spectrum.