Problem 1: *(Signal Representation)*
Describe the following signal, \( x(t) \), in terms of some basis functions (e.g., step, impulse, ramp or sinusoidal):
**Problem 2: (Laplace Transform)**

Determine the Laplace transform of the following signal, $x(t)$, with only *three* periods (cycles).
**Problem 3:** *(Laplace Transform Theorem)*

Consider a function \( x(t) \). Show

\[
\dot{x}(0) = \left. \frac{dx(t)}{dt} \right|_{t=0} = \lim_{s \to \infty} \left[ s^2 X(s) - sx(0) \right].
\]
Problem 4: (Transfer Function)
For the circuit shown below, find the transfer function defined below
\[ H_2(s) = \frac{I_2(s)}{V_1(s)}. \]
**Problem 5: (Analogous System)**
Determine an analogous electrical circuit for the mechanical system shown below, where \( p(t) \) is the force input to the system.