QUIZ 3 (267)

Problem 1. Find the inverse Laplace transform for the function $F(s) = \ln\left(\frac{s-1}{s}\right)$.

Problem 2. Solve the initial value problem:

$$x'' + 4x' + 4x = 2\delta(t-\pi), \quad x(0) = 0,\ x'(0) = 0.$$

Problem 3. Consider the mass-spring dashpot system with position function $x(t)$ satisfying the equation

$$mx'' + cx' + kx = f(t), \quad x(0) = 0,\ x'(0) = 0,$$

where $m = 1, c = 0, k = 4$ and $f(t) = cos(t)u(t-1)$. Find $x(t)$.

Problem 4. Find the Laplace transform for the function $f(t) = t^2 + 1 + t$ if $0 \leq t < 2$ and $f(t) = 1$ if $t \geq 2$.