Last Name:

First Name:

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Quiz n⁰ 5 (20 minutes)

Show your work and justify your answers. Calculators, notes, cell phones, books are not allowed. The table of Laplace transforms is allowed. Please do not use red or pink ink. Maximum: 20 points

Exercise 1 (4+6 points) .

(a) Write the following function using the unit step function

$$f(t) = \begin{cases} t & \text{if } 0 \leq t < \pi \\ \cos(3t) & \text{if } \pi \leq t < 2\pi \\ 0 & \text{if } t \geq 2\pi \end{cases}$$

(b) Find the Laplace transform of the function f in (a).

Exercise 2 (10 points) . Solve the following initial value problem using Laplace transforms.

$$y'' + 2y' + 2y = e^{-t} \qquad \text{with initial conditions } y(0) = y'(0) = 0$$