

QUIZ 7 - MATH 310

Thursday, April 11

YOUR NAME: \_\_\_\_\_

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Read each problem **very carefully** before starting to solve it and do only what is asked. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. [6 points] Consider the function  $F(s) = \frac{1}{s^2 + 7s}$ .

(a) Find  $f(t) = \mathcal{L}^{-1}\{F(s)\}$  without using convolutions.

(b) Find  $f(t) = \mathcal{L}^{-1}\{F(s)\}$  using convolutions (verify that the two answers are the same).

2. [3 points] Find  $F(s) = \mathcal{L}\{f(t)\}$  if  $f(t) = \int_0^t u_5(\tau)e^{3\tau} \cos(7(t-\tau))d\tau$ .

3. [6 points] Solve the initial value problem

$$y'' + 2y' + 10y = g(t), \quad y(0) = 0, \quad y'(0) = 1.$$