Name: ───────────────────────── PID: ─────────────────────

- Print your NAME and your PID on the first page.

- No credit will be given for unsupported answers, even if correct.

- This is an open book exam which means that you can use the textbook, lecture notes and your homework as assistance. But no any electronic devices are allowed and you cannot use the internet, except for the purpose of writing solutions. You are also not allowed to share the exams to anyone else.

- This exam has 3 questions with a maximum of 22 points.

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1. (6 pt) Determine
$$\mathcal{L}^{-1}\{\frac{3s^2 + 5s + 3}{s^4 + s^3}\}.$$

2. (8 pt) Solve the following integral equation
$$y(x) = 1 + x - \int_0^x (x - t)y(t)dt.$$

3. (8 pt) Find the solution of the given initial value problem:
$$y'' + 2y' + 2y = \delta(t - \pi), \quad y(0) = 1, \ y'(0) = 0.$$

(For your convenience, the above problems are also printed in the following three pages.)

- Determine

$$\mathcal{L}^{-1}\{\frac{3s^2 + 5s + 3}{s^4 + s^3}\}.$$

- Solve the following integral equation

$$y(x) = 1 - \int_0^x (x - t)y(t)dt.$$

- Find the solution of the given initial value problem:

$$y'' + 2y' + 2y = \delta(t - \pi), \quad y(0) = 1, \, y'(0) = 0.$$