Vibrations & Control

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HW Set 2

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1. Find the inverse Laplace transform of the rational polynomial function

$$F(s) = \frac{s^2 + 4s + 5}{s(s+1)}$$

2. Find the solution of the initial value problem

$$2\ddot{x}(t) + 9\dot{x}(t) + 4x(t) = 0,$$

   with initial conditions

$$x(0) = 3, \quad \dot{x}(0) = 0.$$

   Describe what you are doing and show all work.

3. Find the solution of the initial value problem

$$\ddot{x}(t) + x(t) = \sin(t),$$

   with initial conditions

$$x(0) = 0, \quad \dot{x}(0) = 0.$$

   Describe what you are doing and show all work.