Suggested problems 24

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1. Solve each initial value problem

   (a) $y'' + 4y' + 5y = u_3(t) - u_6(t), \qquad y(0) = 0, \quad y'(0) = 4.$

   (b) $y'' + 25y = t - tu_6(t), \qquad y(0) = 0, \quad y'(0) = 3.$

2. Find the Laplace transform of

$$f(t) = \delta(t-2)t^3 e^{-t}\cos^3(\pi t).$$

3. Find the inverse Laplace transform of

$$F(s) = \frac{s^3 + 3s^2 + 6s}{(s+1)^3}.$$

4. Solve the initial value problem

$$y'' + 5y' + 6y = \delta(t) + \delta(t-5), \qquad y(0) = -4, \quad y'(0) = 0.$$