Dr. Z.'s Calc5 Homework assignment 6

Use the Laplace Transform method to solve the systems of differential equations.

1.

$$\frac{dx}{dt} = -x + y \quad ,$$
$$\frac{dy}{dt} = 2x \quad ,$$
$$x(0) = 0 \quad , \quad y(0) = 1 \quad .$$

2.

$$\frac{dx}{dt} = -x + 5y \quad ,$$
$$\frac{dy}{dt} = -2x + y \quad ,$$
$$x(0) = 2 \quad , \quad y(0) = -1 \quad .$$

3.

$$\frac{d^2x}{dt^2} + 3\frac{dy}{dt} + 3y = 0 \quad ,$$
$$\frac{d^2x}{dt^2} + 3y = te^{-t} \quad ,$$
$$x(0) = 2 \quad , \quad x'(0) = 2 \quad , \quad y(0) = 0 \quad .$$

4.

$$\frac{d^2x}{dt^2} = \frac{5}{2}x - \frac{3}{2}y$$
$$\frac{d^2y}{dt^2} = -\frac{3}{2}x + \frac{5}{2}y$$
$$x(0) = 2 \quad , \quad x'(0) = 3 \quad ; y(0) = 0 \quad , \quad y'(0) = -1 \quad .$$