Review exercise 4

1) In this Problem , use the Laplace transform to solve the given system of differential equations $\frac{dx}{dt} = -x + y, \frac{dy}{dt} = 2x; \quad x(0) = 0, y(0) = 1$ (Problem 1, page 230)

2) In this Problem , use the Laplace transform to solve the given system of differential equations $2\frac{dx}{dt} + \frac{dy}{dt} - 2x = 1, \frac{dx}{dt} + \frac{dy}{dt} - 3x - 3y = 2; \quad x(0) = 0$, $y(0) = 0$ (Problem 5, page 230)

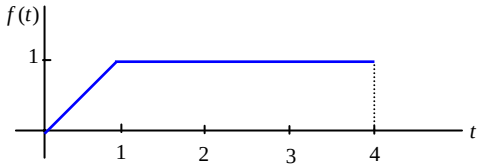
3) In this Problem , use the Laplace transform to solve the given system of differential equations $\frac{d^2x}{dt^2} + \frac{d^2y}{dt^2} = t^2, \quad \frac{d^2x}{dt^2} - \frac{d^2y}{dt^2} = 4t; \quad x(0) = 8, x'(0) = 0,$ $y(0) = 0, y'(0) = 0$ (Problem 9, page 231)

4) In this Problem, use the definition of the Laplace transform to find $L\{f(t)\}$ $f(t) = \begin{cases} t, & 0 \le t < 1 \\ 2 - t, & t \ge 1 \end{cases}$ (Problem 1, page 232)

5) Solve $L^{-1}\{\frac{s}{s^2 - 10s + 29}\}$ (Problem 17, page 232)

6) Solve $L^{-1}\{\frac{s + \pi}{s^2 + \pi^2} e^{-s}\}$ (Problem 19, page 232)

7) In this Problem, express f in terms of unit step functions. Find $L\{f(t)\}$ and $L\{e^t f(t)\}$ (Problem 29, page 233)



8) In this Problem, use the Laplace transform to solve the given equation $y'' + 6y' + 5y = t - t\,u(t-2); \quad y(0) = 1, y'(0) = 0$ (Problem 35, page 233)