

MA 201 (Diff. Equations)

HW-5

1) Find the Laplace transforms of f if:

$$a) f(x) = \begin{cases} 0, & 0 < x < \frac{\pi}{2} \\ \cos x, & x > \frac{\pi}{2} \end{cases},$$

$$b) f(x) = \begin{cases} 0, & 0 < x < 2 \\ e^{-x}, & x > 2 \end{cases}.$$

2) Use the convolution Theorem to find

$$a) L^{-1} \left[\frac{3s+4}{s(s^2+4s+13)} \right],$$

$$b) L^{-1} \left[\frac{1}{s^2(s+3)} \right].$$

3) Use the Laplace Transform Method to solve the following initial-value problems:

$$a) y'' + y' - 2y = x e^{2x}; \quad y(0) = 1, \quad y'(0) = -2,$$

$$b) y''' + y'' + 4y' + 4y = -2; \quad y(0) = 0, \quad y'(0) = 1, \quad y''(0) = -1.$$

Deadline: 15.12.10