

# Math 135, Extra Problems

## for Homework 2

1. Find a function whose Laplace transform is:

(a)  $\frac{1}{2-p}$

(b)  $\frac{5}{p^2+16}$

(c)  $\frac{8}{p^2}$

(d)  $\frac{4}{p^4} + \frac{2}{p} + \frac{3}{p-1}$

(e)  $\frac{2}{4-p^2}$

2. Solve the following differential equations using the Laplace transform:

(a)  $y'' - 2y' + y = x, y(0) = 2, y'(0) = 1$

(b)  $y'' + 2y' + y = e^{-x}, y(0) = 1, y'(0) = 0$

(c)  $y'' + 5y' + 6y = e^{-3x}, y(0) = 1, y'(0) = 1$

(d)  $y'' + 3y' + 2y = \sin[x], y(0) = -1, y'(0) = 1$

(e)  $y'' - 8y' + 12y = e^{-5x}, y[0] = 0, y'[0] = 1$