

NAME: _____

AM 033 — Applied Mathematics - I

Brown University
Homework, Set 10

Fall 2003
Due December 3

10.1 Find the inverse Laplace transform of the following:

(a) $\frac{18s + 6}{(s + 1)^4}$,

(b) $\frac{s}{s^2 + 8s + 16}$,

(c) $\frac{5s - 1}{s^2(s + 2)(s - 1)}$,

(d) $\frac{8s - 3}{s^2 + 2s + 10}$.

10.2 Use the Laplace transform to solve the given initial value problems.

(a) $y' - 3y = 13 \cos 2t$, $y(0) = 1$.

(b) $y'' - y = 1 - e^{-t}$, $y(0) = 1$, $y'(0) = 0$.

(c) $y'' + 4y' + 4y = 8 \cos 2t$, $y(0) = 2$, $y'(0) = 5$.

(d) $y'' + 9y = 6[H(t) - H(t - \pi)]$, $y(0) = 1$, $y'(0) = 3$.

(e) $y'' + 3y' + 2y = H(t - 2)$, $y(0) = 0$, $y'(0) = 1$.

(f) $y'' + 2y' + 2y = H(t - \pi) - H(t - 2\pi)$, $y(0) = 0$, $y'(0) = 2$.