

## Homework #6 — due Friday, 5/31

To turn in:

**6.1:** #5(b)\*, #12\*, #15\*

**6.2:** #6, #8, #21, #22

**A1 — A2** (below)

\* For these problems, find the Laplace transforms using the definition ( $\mathcal{L}\{f\}(s) = \int_0^\infty e^{-st} f(t) dt$ ) instead of the table.

**A1** Using the Laplace transform, solve the initial value problem

$$\begin{aligned}y^{(4)} - 3y'' - 4y &= 0 \\y(0) &= 4 \\y'(0) &= 3/2 \\y''(0) &= 1 \\y'''(0) &= 17/2.\end{aligned}$$

(Hint: to factor  $s^4 - 3s^2 - 4$ , start by substituting  $r = s^2$ .)

**A2** Using the Laplace transform, solve the initial value problem

$$\begin{aligned}y^{(3)} - 4y' &= 6e^{-t} \\y(0) &= -1 \\y'(0) &= 0 \\y''(0) &= 2.\end{aligned}$$