

Chapter 1, Review problems (page 76): problem 32.

Sec. 3.1: problems 25, 28, 35, 39, 45, 48.

Sec. 3.3: problems 8, 21, 23.

Sec. 3.5: problems 2, 4, 9, 32.

Hint for Problem 3.5/9: Since the right-hand side of the equation can be written as $f_1(x) + f_2(x)$ with $f_1(x) = 1$ and $f_2(x) = xe^x$, look separately for a particular solution $y_{p,1}(x)$ of the ODE

$$y'' + 2y' - 3y = f_1(x) ,$$

and for a particular solution $y_{p,2}(x)$ of the ODE

$$y'' + 2y' - 3y = f_2(x) .$$

Then the general solution of the original non-homogeneous ODE,

$$y'' + 2y' - 3y = f_1(x) + f_2(x) ,$$

has the form

$$y(x) = y_c(x) + y_{p,1}(x) + y_{p,2}(x)$$

(where $y_c(x)$ is the general solution of the associated homogeneous equation).