EXERCISES 18.6

Find general solutions for the nonhomogeneous equations in Exercises 1–12 by the method of undetermined coefficients.

1. $y'' + y' - 2y = 1$
2. $y'' + y' - 2y = x$
3. $y'' + y' - 2y = e^{-x}$
4. $y'' + y' - 2y = e^{x}$
5. $y'' + 2y' + 5y = x^2$
6. $y'' + 4y = x^2$
7. $y'' - y' - 6y = e^{-2x}$
8. $y'' + 4y' + 4y = e^{-2x}$
9. $y'' + 2y' + 2y = e^{x} \sin x$
10. $y'' + 2y' + 2y = e^{-x} \sin x$
11. $y'' + y' = 4 + 2x + e^{-x}$
12. $y'' + 2y' + y = xe^{-x}$
13. Repeat Exercise 3 using the method of variation of parameters.
14. Repeat Exercise 4 using the method of variation of parameters.
15. Find a particular solution of the form $y = Ax^2$ for the Euler equation $x^2y'' + xy' - y = x^2$, and hence obtain the general solution of this equation on the interval $(0, \infty)$.
16. For what values of r can the Euler equation $x^2y'' + xy' - y = x^r$ be solved by the method of Exercise 15? Find a particular solution for each such r.
17. Try to guess the form of a particular solution for $x^2y'' + xy' - y = x$, and hence obtain the general solution for this equation on the interval $(0, \infty)$.