

## TWK2A Cauchy-Euler DEs (Section 4.7) Problems

Solve the following DEs:

1.  $xy'' + y' = 0$
2.  $x^2y'' + 5xy' + 3y = 0$
3.  $2x^2y'' + 5xy' + y = x^2 - x$  (use variation of parameters)
4.  $x^2y'' - 9xy' + 25y = 0$  (use the substitution  $x = e^t$ )
5.  $(x + 2)^2 y'' + (x + 2)y' + y = 0$
6.  $x^2y'' + 3xy' - 4y = 0$
7.  $x^3y''' + xy' - y = 0$
8.  $x^2y'' - 2xy' + 2y = x^4e^x$  (use variation of parameters)
9.  $x^2y'' - 3xy' + 4y = 0$  with  $y(1) = 5, y'(1) = 3$
10.  $xy'' - 3y' = 0$
11.  $x^2y'' - 5xy' + 8y = 8x^6$  with  $y(\frac{1}{2}) = 0, y'(\frac{1}{2}) = 0$
12. Can a Cauchy -Euler DE of lowest order with real coefficients be found if it is known that 2 and  $1 - i$  are roots of its auxiliary equation?
13.  $x^2y'' - xy' + y = 2x$