國立臺灣海洋大學河海工程學系 2017 工程數學(一) 2A 班第七次作業參考解答

系級：_____　　學號：_____　　姓名：_____

1. 試解:

(1) $x^3y''' + x^2y'' - 2xy' + 2y = x^{-2}$

(2) $x^2y'' - 3xy' + 4y = 3x^2$

(3) $x^2y'' + xy' - y = x\ln x$

(4) $x^2y'' - 2xy' + 2y = x\ln x$

(5) $x^2y'' - 4xy' + 6y = -7x^4\sin x$

參考解答:

1. (1) $y(x) = c_1x^{-1} + c_2x + c_3x^2 - \frac{1}{12}x^{-2}$

(2) $y(x) = (c_1 + c_2\ln x)x^2 + \frac{3}{2}x^2(\ln x)^2$

(3) $y(x) = c_1x^{-1} + c_2x + x[\frac{1}{4}(\ln x)^2 - \frac{1}{4}\ln x]$

(4) $y(x) = c_1x + c_2x^2 - x[\frac{1}{2}(\ln x)^2 + \ln x]$

(5) $y(x) = c_1x^2 + c_2x^3 + 7x^2\sin x$