

Problem set 12 Hints and Answers

1.
 - a. Ans: $y(x) = (A + B \log x)x^2 + x^2(\log x)^2$
 - b. Ans: $y(x) = x^{-3}(A \cos(2 \log x) + B \sin(2 \log x)) + \frac{1}{169}(13 \log x - 6)$
 - c. Ans: $y(x) = Ax^2 + Bx^3 + \frac{1}{2}x^4$
 - d. Ans: $y(x) = Ax + B\frac{1}{x} + \frac{1}{m^2-1}x^m$
 - e. Ans: $y(x) = x^2(A \cos(\log x) + B \sin(\log x)) + \frac{1}{8}(\sin(\log x) + \cos(\log x))$
 - f. Ans: $y(x) = x(A + B \log x) + 4 + 2 \log x$
 - g. Ans: $y(x) = x^m(A \cos(n \log x) + B \sin(n \log x)) + x^m \log x$
 - h. Ans: $y(x) = x(A \cos(\log x) + B \sin(\log x)) + x \log x$
 - i. Ans: $y(x) = x^2(A \cos(\log x) + B \sin(\log x)) - \frac{x^2}{2} \log x \cos(\log x)$
 - j. Ans: $y(x) = (A + B \log x) \cos(\log x) + (C + D \log x) \sin(\log x) + (\log x)^2 + 2(\log x) - \frac{3}{3}$
2.
 - a. Ans: $y(x) = A(x+1)^2 + B(x+1)^3 + 3(x+1)$
 - b. Ans: $y(x) = A + B \log(x+1) + (1+x)^2 + 6(1+x) + (\log(1+x))^2$
 - c. Ans: $y(x) = (1+2x)^2[A + B \log(1+2x) + (\log(1+2x))^2]$
3.
 - a. Ans: $y(x) = A + Be^{2x} - \frac{1}{2}e^x \sin x$
 - b. Ans: $y(x) = (A + Bx)e^{3x} - e^{3x}(\log x + 1)$
 - c. Ans: $y(x) = (A + Bx)e^x + \frac{1}{4}x^2e^x(2 \log x - 3)$
 - d. Ans: $y(x) = A + B \cos x + C \sin x + \ln(\sec x) + (\cos x)^2 + (\sin x)^2 - \sin \ln(\sec x + \tan x)$
 - e. Ans: $y(x) = Ae^{-3t} + Be^{-t} + Ce^{6t} - \frac{1}{6} + \frac{5}{49}e^{-t} - \frac{2}{7}te^{-t}$
 - f. Ans: $y(x) = e^x(A \cos x + B \sin x) - e^{-x} \cos x \log(\sec x + \tan x)$
4.
 - a. Ans: $y(x) = -\frac{1}{4} + \frac{1}{4}e^{2x} - \frac{1}{2}e^x \sin x$