

$$y_{z+2} = y'' = [z^2 + 2z - 2]y''$$

$$= 4y'' \quad \text{for } n=3$$

$$y_{z+2} = y'' = [3z^2 + 3z - 2]$$

$$= 10y'' = 0$$

$$\text{for } n=4$$

$$y_{z+2} = y'' = [4z^2 + 4z - 2]$$

$$= 18y'' = 72y''$$

$$y_n = f(x) + y''(x) + y''(x)$$

$$+ y''(x) = f''(x) + y''(x) + y''(x)$$

$$y_n = 1 + y'' + y'' = 1 + 0 + 4y'' + 4y''$$

$$y_n = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y_n = 1 + y'' + 23y''$$

$$y_n = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y_n = 1 + y'' + 23y''$$

$$y_n = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y_n = 1 + y'' + 23y''$$

$$y_n = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y_n = 1 + y'' + 23y''$$

$$y_n = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y_n = 1 + y'' + 23y''$$

$$y_n = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y_n = 1 + y'' + 23y''$$

$$y_n = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y_n = 1 + y'' + 23y''$$

$$y_n = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y_n = 1 + y'' + 23y''$$

$$y'' = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y'' = 1 + y'' + 23y''$$

$$y'' = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y'' = 1 + y'' + 23y''$$

$$y'' = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y'' = 1 + y'' + 23y''$$

$$y'' = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y'' = 1 + y'' + 23y''$$

$$y'' = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y'' = 1 + y'' + 23y''$$

$$y'' = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y'' = 1 + y'' + 23y''$$

$$y'' = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y'' = 1 + y'' + 23y''$$

$$y'' = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y'' = 1 + y'' + 23y''$$

$$y'' = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y'' = 1 + y'' + 23y''$$

$$y'' = 1 + y'' + y'' = 1 + 1/2 + 1/6 + 1/10$$

$$y'' = 1 + y'' + 23y''$$

$$= -dx/d [1/s^2 + 3s + 2]$$

$$du = 0 \quad dv = 2s + 3$$

$$= -[2s+3 / (s^2+3s+2)]^2$$

$$vii) e^{4t} \cos 2t = s / (s^2+2^2)$$

$$= s/s^2 - 8s + 16 + 4 = s/s^2 - 8s + 20$$

$$viii) t \sin 2t = [-1]^{1/2} dx [3/s^2 + 2^2]$$

$$du = 0 \quad dv = 2s$$

$$= -1 [4s / (s^2+2^2)]^2$$

$$= 4s / (s^2+8s^2+16)$$

$$ix) t^3 + 4t^2 + 5 = 3! / t^{3+1}$$

$$+ 4 [2!] / s^{2+1} + 5/s = 6/s^4$$

$$+ 8/s^3 + 5/s$$

$$x) e^{3t} [t^2 + 4] = e^{3t} t^2 + 4e^{3t}$$

$$= 2! / (s-3)^{2+1} + 4/s-3$$

$$= 2 / (s-3)^2 + 4/s-3$$

$$xi) t^2 \cos t = [-1]^2 \cdot \frac{d^2}{dx^2}$$

$$[s/s^2 + 1] = du = 1 \quad dv = 2s$$

$$= d/dx [1-s^2/s^2+1] = du =$$

$$-2s, \quad dv = 2s$$

$$= [-2s^3 - 2s - 2s + 2s^3 / (s^2+1)]^2$$

$$= -4s / (s^2+1)^2$$

$$x) \sinh 2t/t = 1/2 \ln [s^2-2^2]$$

$$= \ln s = 1/2 \ln [s^2-4] - \ln s$$

$$3) s^{-5} / (s-3)(s-4)$$

$$= A/s-3 + B/s-4$$

$$s-5 = A[s-4] + B[s-3]$$

$$3-5 = A[3-4] + B[3-3]$$

$$A = 2 / -1 = -2$$

$$4-5 = A[4-4] + B[4-3]$$

$$-1 = B \Rightarrow B = -1$$

$$= 2/s-3 - 1/s-4$$

$$= 2 [1/s-3 - 1/s-4] = 2e^{3t} - e^{4t}$$

$$ii) 2s-6 / (s-2)(s-4) = A/s-2 + B/s-4$$

$$s-6 = A[s-4] + B[s-2]$$

$$2[2]-6 = A[2-4] + B[2-2]$$

$$-2 = -2A \Rightarrow A = 1$$

$$2(4)-6 = A(4-4) + B(4-2)$$

$$2 = 2B - B = 1$$

$$= 1/s-2 + 1/s-4 = e^{2t} + e^{4t}$$

$$iii) s^2-5 / (s-4) = A/s + B/s-4$$

$$A[s-4] + Bs = s^2-5$$

$$A(0-4) + B(0) = s[0] - 5 = A = -2$$

$$A[A-4] + 4B = s[4] - 5$$

$$B = 12/4 = 3$$

$$iv) s^2-3s-4 / (s-3)(s-1)^2 = A/s-3 + B/s-1$$

$$+ C/(s-1)^2$$

$$s^2-3s-4 = A[s-1]^2 + B[s-3]$$

$$[s-1] + C[s-3]$$

$$s^2-3s-4 = A[s^2-2s+1] + B[s-3]$$

$$= [As+B] + C[s-3]$$

$$A+B = 1$$

$$C-2A-4B = -3$$

$$A+3B-3C = -4$$

$$1^2-3[1]-4 = C[1-3]$$

$$-6 = -2C \Rightarrow C = 3$$

$$A+3B-3[3] = -4$$

$$A+3B = -4+9 = 5$$

$$A+3B = 5$$

$$A+B = 1 \quad 2B = 4 \quad B = 2$$

$$A+B = 1 \quad A = 1-B = 1-2 = -1$$

$$= L^{-1} [-1/s-3 + 2/s + 3/2t^2 e^t]$$

$$= -e^{3t} + 2e^t + 3/2 t^2 e^t$$

$$v) s^{-5} / (s^2+4s+20) = s^{-5} / (s^2+4s+4^2)$$

$$= s^{-5} / (s+2)^2 + 16$$

$$s-5 = e^{2t} \cos 4t$$

$$[s+2]^2 + 4^2$$