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17/ENG02/015

### COMPUTER ENGINEERING.

#### Assignment 2

Solution

$$y = e^{2x+x}$$

$$y' = (2x+1)e^{2x+x}$$

$$y'' = 2e^{2x+x} + (2x+1)(2x+1)e^{2x+x}$$

$$y''' = 2e^{2x+x} + (2x+1)^2 e^{2x+x}$$

$$y'(2x+1) + 2y$$

$$= (2x+1)e^{2x+x} (2x+1) + 2(e^{2x+x})$$

$$= 2(2x+1)^2 e^{2x+x} + 2e^{2x+x}$$

$$\text{But } y''' = 2e^{2x+x} + (2x+1)^2 e^{2x+x}$$

$$y''' = y'(2x+1) + 2y$$

from the equation.

part A.

$$A = y'', A' = y''', A'' = y'' + 2y$$

part B.

$$B = y'(2x+1)$$

$$u = y'$$

$$v = 2x+1$$

$$v' = 2$$

$$v'' = 0$$

$$\therefore B^n = (y^{n+1})(2x+1) + 2n(y^n)(2) + 0$$

$$B^n = (2x+1)y^{n+1} + 2ny^n$$

part C

$$C = 2y$$

$$C^n = 2^n y^n$$

$$A^n = B^n + C^n$$

$$y^{n+2} = (2x+1)y^{n+1} + 2ny^n + 2y$$

$$y^{n+2} = (2x+1)y^{n+1} + 2ny^n + 2y$$

$$\therefore y^{(n+2)} = (2x+1)y^{(n+1)} + 2(n+1)y^n$$