

# Congratulations

on your  
**Convocation**  
**TAWAKALITU**  
**BALOGUN**

$$y^{n+2}(x^2-x) + ny^{n+1}(2x-1) + (n^2-n)y^n + y^{n+1}(3x-1) + 3ny^n + y^n = 0$$

Collect like terms

$$y^{n+2}(x^2-x) + ny^{n+1}(2x-1) + y^{n+1}(3x-1) + y^n(n^2-n$$

$$+ 3n + 1) = 0$$

~~$$y^{n+2}(x^2-x) + y^{n+1}(2nx-n) + y^n$$~~

$$y^{n+2}(x^2-x) + y^{n+1}(2nx-n+3x-1) + y^n(n^2-n+3n+1) = 0$$

$$y^{n+2}(x^2-x) + y^{n+1}(2nx-n+3x-1) + y^n(n^2+2n+1) = 0$$

when  $x=0$

$$0 + y^{n+1}(-n-1) + y^n(n^2+2n+1) = 0$$

$$y^{n+1}(-n-1) = -y^n(n^2+2n+1) = 0$$

Divide through by  $(-n-1)$

$$\underline{y^{n+1}(-n-1)} = \underline{-y^n(n^2+2n+1)}$$

$$= (-n-1)$$

$$+ (n+1)$$

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

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

$$y^{n+1} = y^n (n+1)$$

when  $n=0$

$$y^1 = y^0 (1)$$

$$y^1 = y^0$$

when  $n=1$

$$y^2 = y^1 (2)$$

when  $n=2$

$$y^3 = 3y^2 = 3(2)y^1 = 6y^1$$

when  $n=3$

$$y^4 = y^3 (4) = 4(6y^1) = 24y^1$$

$$y^5 = y^4 (5) = 5(24y^1) = 120y^1$$

$$y = (y_0) + x(y^1)_0 + \frac{x^2}{2!}(y^2)_0 + \frac{x^3}{3!}(y^3)_0 + \frac{x^4}{4!}(y^4)_0 + \frac{x^5}{5!}(y^5)_0 + \frac{x^6}{6!}(y^6)_0 + \frac{x^7}{7!}(y^7)_0$$

$$y = (y_0) + x(y^1)_0 + \frac{x^2}{2!}(y^2)_0 + \frac{x^3}{3!}(y^3)_0 + \frac{x^4}{4!}(y^4)_0 + \frac{x^5}{5!}(y^5)_0 + \frac{x^6}{6!}(y^6)_0 + \frac{x^7}{7!}(y^7)_0$$

$$y^6 = y^5 (6) = 6(120y^1)$$

$$y^6 = 720y^1$$

$$y^7 = 7y^6$$

$$y^7 = 7(720y^1)$$

$$y^7 = 5040y^1$$

$$Y = [0.0005] [1 + 8 + 64 + 512 + 4096 + 32,768 + 262,144 + 2,097,152]$$

$$Y = [0.0005] [2,396,745]$$

$$Y = \underline{1198.3725 \text{ M}}$$

When  $x = 10$

$$Y = [0.0005] [1 + 10 + (10)^2 + (10)^3 + (10)^4 + (10)^5 + (10)^6 + (10)^7]$$

$$Y = [0.0005] [1 + 100 + 1000 + 10,000 + 100,000 + 1,000,000 + 10,000,000]$$

$$Y = [0.0005] [11,111,100]$$

$$Y = \underline{5,555.55 \text{ M}}$$

~~(x, y)~~

Plot (x, y)

$$Y = (Y)_0 + x(Y')_0 + \frac{x^2}{2!}(2Y') + \frac{x^3}{3!}(6Y') + \frac{x^4}{4!}(24Y') + \frac{x^5}{5!}(120Y') + \frac{x^6}{6!}(720Y') + \frac{x^7}{7!}(5040Y')$$



When  $Y' = 0.0005$

$$(Y')_0 [1 + x + x^2 + x^3 + x^4 + x^5 + x^6 + x^7] = Y$$

~~$$Y = (Y')_0$$~~

$$[0.0005][1 + x + x^2 + x^3 + x^4 + x^5 + x^6 + x^7] = Y$$

When  $x = 5$

$$[0.0005][1 + 5 + (5)^2 + (5)^3 + (5)^4 + (5)^5 + (5)^6 + (5)^7] = Y$$

$$Y = [0.0005][1 + 5 + 25 + 125 + 625 + 3125 + 15,625 + 78,125]$$

$$Y = [0.0005][97,656]$$

$$Y = \underline{\underline{48.828 \text{ m}}}$$

When  $x = 8$

$$Y = [0.0005][1 + 8 + (8)^2 + (8)^3 + (8)^4 + (8)^5 + (8)^6 + (8)^7]$$

$$Y = [0.0005][1 + 8 + 64 + 512 + 4096 + 32,768 + 262,144 + 8^7]$$



**AFE BABALOLA UNIVERSITY**  
 On 21st Oct., 2019  
 Courtesy: Dad & Mum

