Materia:
Calculo Integral

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Equipo Verde

Numero de control:
19070443

$a=0,\ b=4,\ c=4,\ d=3$

1) $\{b(n+2)+c(n+3)+d(n+4)\}$ suma $=325$

$4(1+2)+4(1+3)+3(1+4)=43$

$4(2+2)+4(2+3)+3(2+4)=54$

$4(3+2)+4(3+3)+3(3+4)=65$

$4(4+2)+4(4+3)+3(4+4)=76$

$4(5+2)+4(5+3)+3(5+4)=87$

$43+54+65+76+87=\underline{325}$

2) $\left\{\frac{b+n}{n+1}+\frac{c+n}{n+2}+\frac{d+n}{n+3}\right\}$, suma $=20.755$

$\frac{4+1}{2}+\frac{4+1}{3}+\frac{3+1}{4}=5.76$

$5.76+4.5+3.38+3.93+3.785$

$=20.7\underline{55}$

$\frac{4+2}{3}+\frac{4+2}{4}+\frac{3+2}{5}=4.5$

$\frac{4+3}{4}+\frac{4+3}{5}+\frac{3+3}{6}=3.38$

$\frac{4+4}{5}+\frac{4+4}{6}+\frac{3+4}{7}=3.93$

$\frac{4+5}{6}+\frac{4+5}{7}+\frac{3+5}{8}=3.785$

3) $\{bn^{1.1} + cn^{1.2} + dn^{1,3}\}$, Suma $= 219,314$

$4(1)^{1.1} + 4(1)^{1.2} + 3(1)^{1,3} = 11$

$4(2)^{1.1} + 4(2)^{1.2} + 3(2)^{1,3} = 25.1506$

$4(3)^{1.1} + 4(3)^{1.2} + 3(3)^{1.3} = 40.8557$

$4(4)^{1.1} + 4(4)^{1.2} + 3(4)^{1.3} = 57.6798$

$4(5)^{1.1} + 4(5)^{1.2} + 3(5)^{1.3} = 75.3968$

$a=0, b=4, c=4, d=3$

$a_1 = d+1$
$a_1 = 3+1$
$a_1 = 4$

4) $a_{n+1} = (b+1)a_n + (c+1)n + d$, Suma = $\underline{24,624}$

$n=1$
$a_{1+1} = (4+1)a_1 + (4+1)1+3 =$
$a_2 = 5(4) + 5(1) + 3 = 20+5+3$
$a_2 = 28$

$n=2$
$a_{2+1} = (4+1)a_2 + (4+1)2 + 3 =$
$a_3 = 5(28) + 5(2) + 3 = 140+10+3 =$
$a_3 = 153$

$n=3$
$a_{3+1} = (4+1)a_3 + (4+1)3+3 =$
$a_4 = 5(153) + 5(3) + 3 = 765+15+3$
$a_4 = 783$

$n=4$
$a_{4+1} = (4+1)a_4 + (4+1)4+3 =$
$a_5 = 5(783) + 5(4) + 3 = 3,915 + 20+3$
$a_5 = 3,938$

$n=5$
$a_{5+1} = (4+1)a_5 + (4+1)5+3 =$
$a_6 = 5(3,938) + 5(5) + 3 = 19,690+25+3 =$
$a_6 = 19,718$

$a_1 + a_2 + a_3 + a_4 + a_5 + a_6 = 4+28+153+783+3938+19,718 = \underline{24,624}$

$a = 0 \quad b = 4 \quad c = 4 \quad d = 3$

$a_1 = d + 1$

$a_1 = 4$

5) $a_{n+1} = (c+1)a_n + (c-n)a_n + nd$, suma =

suma $= 4 + 35 + 251 + 1,515 + 7,587 + 30,363 = \underline{\underline{39,755}}$

$a_1 = 4$

$n = 1$

$a_{1+1} = (5)a_1 + (3)a_1 + 3 =$

$a_2 = 5(4) + 3(4) + 3 =$

$a_2 = 20 + 12 + 3 = \underline{\underline{35}}$

$n = 2$

$a_{2+1} = 5a_2 + 2a_2 + 6 =$

$a_3 = 5(35) + 2(35) + 6 =$

$a_3 = 175 + 70 + 6 = \underline{\underline{251}}$

$n = 3$

$a_{3+1} = 5a_3 + 1a_3 + 9 =$

$a_4 = 5(251) + 1(251) + 9 =$

$a_4 = 1,255 + 251 + 9 = \underline{\underline{1,515}}$

$n = 4$

$a_{4+1} = 5a_4 + 0a_4 + 12 =$

$a_5 = 5(1,515) + 0 + 12 =$

$a_5 = 7,575 + 12 = \underline{\underline{7,587}}$

$n = 5$

$a_{5+1} = 5a_5 + (-1)a_5 + 15 =$

$a_6 = 5(7,587) + (-1)(7,587) + 15 =$

$a_6 = 37,935 - 7,587 + 15 = \underline{\underline{30,363}}$

$a=0 \quad b=4 \quad c=4 \quad d=3$

III. Calcula las somatorias infinitas indicadas

6) $\sum_{i=1}^{\infty}\left(\frac{8}{12}\right)^{i} = \frac{r}{1-r} = \frac{\frac{8}{12}}{1-\frac{8}{12}} = \frac{\frac{8}{12}}{\frac{1}{3}} = \frac{24}{12}$

$\underline{\underline{=2}}$

7) $\sum_{i=1}^{\infty} (a+b+1)\left(\frac{b+d+1}{b+c+d+1}\right)^i =$

$\sum_{i=1}^{\infty} (0+4+1)\left(\frac{4+3+1}{4+4+3+1}\right)^i =$

$\sum_{i=1}^{\infty} (5)\left(\frac{8}{12}\right)^i =$

$(5)\sum_{i=1}^{\infty}\left(\frac{8}{12}\right)^i = \frac{r}{1-r} = \frac{\frac{8}{12}}{1-\frac{8}{12}} = \frac{\frac{8}{12}}{\frac{4}{12}} = 2 =$

$5 \cdot 2 = 10$

$5\left(\sum_{i=1}^{\infty}\left(\frac{8}{12}\right)^i\right) = \underline{10}$

$a=0, b=4, c=4, d=3$

IV.- Una pelota se deja caer desde una altura $H=50(a+b+c+d+1)m$, si después de cada rebote la altura máxima que alcanza es $\frac{86+d}{100}$ de su altura máxima anterior, determina la distancia total que recorre.

$H=50(0+4+4+3+1)m$
$H=50(12)m$
$H=600m$

$$\frac{86+d}{100} = \frac{86+3}{100} = \frac{89}{100}$$

8) $H_{TOT} = H+2H\left(\frac{r}{1-r}\right) =$

$$H_{TOT} = 600+2(600)\left(\frac{\frac{89}{100}}{1-\frac{89}{100}}\right) =$$

$$H_{TOT} = 600+1200\left(\frac{8,900}{1,100}\right)$$

$$H_{TOT} = \underline{10,309.0909\,m}$$

$a=0, b=4, c=4, \delta=3$

9) $(a+c+\delta+1)\int_{b+1}^{b+2} \frac{sen(x)}{x}\,dx =$

$(0+4+3+1)\int_{4+1}^{4+2} \frac{\sum_{n=1}^{\infty} \frac{(-1)^{n+1}x^{2n-1}}{(2n-1)!}}{x}\,dx$

$8\int_{5}^{6} \frac{\sum_{n=1}^{\infty} \frac{(-1)^{n+1}x^{2n-1}}{(2n-1)!}}{x}\,dx$

$8\int_{5}^{6} \frac{1}{x}\left(\frac{(-1)^{1+1}x^{2(1)-1}}{(2(1)-1)!} + \frac{(-1)^{2+1}x^{2(2)-1}}{(2(2)-1)!} + \frac{(-1)^{3+1}x^{2(3)-1}}{(2(3)-1)!} + \frac{(-1)^{4+1}x^{2(4)-1}}{(2(4)-1)!} + \frac{(-1)^{5+1}x^{2(5)-1}}{(2(5)-1)!}\right)dx =$

$8\int_{5}^{6} \frac{1}{x}\left(x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!}\right)dx =$

$8\int_{5}^{6} \left(1 - \frac{x^2}{3!} + \frac{x^4}{5!} - \frac{x^6}{7!} + \frac{x^8}{9!}\right)dx = x - \frac{x^3}{3(3!)} + \frac{x^5}{5(5!)} - \frac{x^7}{7(7!)} + \frac{x^9}{9(9!)}\Big|_5^6$

$8\left(6 - \frac{6^3}{3(3!)} + \frac{6^5}{5(5!)} - \frac{6^7}{7(7!)} + \frac{6^9}{9(9!)} - \left(5 - \frac{5^3}{3(3!)} + \frac{5^5}{5(5!)} - \frac{5^7}{7(7!)} + \frac{5^9}{9(9!)}\right)\right) =$

$= \underline{3.708}$

$a=0, b=4, c=4, d=3$

10) $(a+c+d+1)\int_{b+1}^{b+2} \frac{\ln(x+1)}{x}dx =$

$(0+4+3+1)\int_{4+1}^{4+2} \frac{\ln(x+1)}{x}dx =$

$8\int_5^6 \frac{\ln(x+1)}{x}dx = \frac{\sum_{n=1}^{\infty} \frac{(-1)^{n+1}x^n}{n}}{x} =$

$8\int_5^6 \frac{1}{x}\left(\frac{(-1)^{1+1}x^1}{1} + \frac{(-1)^{2+1}x^2}{2} + \frac{(-1)^{3+1}x^3}{3} + \frac{(-1)^{4+1}x^4}{4} + \frac{(-1)^{5+1}x^5}{5}\right)dx =$

$8\int_5^6 \frac{1}{x}\left(x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \frac{x^5}{5}\right)dx =$

$8\int_5^6 \left(1 - \frac{x}{2} + \frac{x^2}{3} - \frac{x^3}{4} + \frac{x^4}{5}\right)dx = x - \frac{x^2}{2^2} + \frac{x^3}{3^2} - \frac{x^4}{4^2} + \frac{x^5}{5^2}\Big|_5^6 =$

$8\left(6 - \frac{6^2}{4} + \frac{6^3}{9} - \frac{6^4}{16} + \frac{6^5}{25} - \left(5 - \frac{5^2}{4} + \frac{5^3}{9} - \frac{5^4}{16} + \frac{5^5}{25}\right)\right) =$

$= \underline{1219.708889}$