No. de control = 0343 $a=0, b=3, c=4, \delta=3$

1. Obtén la suma de los primeros 5 términos de las siguientes series:

1) $\left\{\frac{b+n}{n+1}+\frac{c+n}{n+2}+\frac{\delta+n}{n+3}\right\}$, Suma $=\frac{703}{35}=20.0857$

$n=1$

$$\frac{3+1}{1+1}+\frac{4+1}{1+2}+\frac{3+1}{1+3}=\frac{4}{2}+\frac{5}{3}+\frac{4}{4}=\frac{14}{3}=4.666$$

$n=2$

$$\frac{3+2}{2+1}+\frac{4+2}{2+2}+\frac{3+2}{2+3}=\frac{5}{3}+\frac{6}{4}+\frac{5}{5}=\frac{25}{6}=4.1666$$

$n=3$

$$\frac{3+3}{3+1}+\frac{4+3}{3+2}+\frac{3+3}{3+3}=\frac{6}{4}+\frac{7}{5}+\frac{6}{6}=\frac{39}{10}=3.9$$

$n=4$

$$\frac{3+4}{4+1}+\frac{4+4}{4+2}+\frac{3+4}{4+3}=\frac{7}{5}+\frac{8}{6}+\frac{7}{7}=\frac{56}{15}=3.7333$$

$n=5$

$$\frac{3+5}{5+1}+\frac{4+5}{5+2}+\frac{3+5}{5+3}=\frac{8}{6}+\frac{9}{7}+\frac{8}{8}=\frac{76}{21}=3.619\ldots$$

$$\frac{14}{3}+\frac{25}{6}+\frac{39}{10}+\frac{56}{15}+\frac{76}{21}=\frac{703}{35}=20.0857\ldots$$

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

11.- Dado $a_1 = d+1$, determina la suma de los primeros 5 términos de la siguiente sucesión definida recursivamente

$a_1 = d+1$

$a_1 = 3+1$

$a_1 = 4$

2) $a_{n+1} = (a+1)a_n + (c+1)n+b$, Suma= 150

$n=1$

$a_{1+1} = (0+1)a_1 + (4+1)1+3 =$

$a_2 = (1)4 + 5(1)+3$

$a_2 = 4+5+3 =$

$a_2 = 12$

$n=2$

$a_{2+1} = (0+1)a_2 + (4+1)2+3 =$

$a_3 = 1(12) + 5(2)+3 =$

$a_3 = 12+10+3 =$

$a_3 = 25$

$n=3$

$a_{3+1} = (0+1)a_3 + (4+1)3+3 =$

$a_4 = 1(25) + 5(3)+3 =$

$a_4 = 25+15+3 =$

$a_4 = 43$

$n=4$

$a_{4+1} = (0+1)a_4 + (4+1)4+3 =$

$a_5 = 1(43) + 5(4)+3 =$

$a_5 = 43+20+3 =$

$a_5 = 66$

$a_1 + a_2 + a_3 + a_4 + a_5 = 4+12+25+43+66 = 150$

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

III.- Calcula la sumatoria infinita indicada

3) $\sum_{i=1}^{\infty}\left(\frac{c+d+2}{a+b+c+d+3}\right)^{i}=$

$$\sum_{i=1}^{\infty}\left(\frac{4+3+2}{0+3+4+3+3}\right)^{i}=$$

$$\sum_{i=1}^{\infty}\left(\frac{9}{13}\right)^{i}=\frac{r}{1-r}=\frac{\frac{9}{13}}{1-\frac{9}{13}}=\frac{\frac{9}{13}}{\frac{4}{13}}=\frac{9}{4}=2.25$$

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

IV.- Una pelota se deja caer desde una altura $H=25(a+b+c+d+3)$ m, si después de cada rebote la altura máxima que alcanza es $\frac{90+d}{100}$ de su altura máxima anterior, determina la distancia total que recorre

$H=25(a+b+c+d+3)$
$H=25(0+3+4+3+3)$
$H=25(13)$
$H=325$

$$\frac{90+d}{100}=\frac{90+3}{100}=\frac{93}{100}$$

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

4) $$H_{TOT}=325+2(325)\left(\frac{\frac{93}{100}}{1-\frac{93}{100}}\right)=$$

$$H_{TOT}=325+2(325)\left(\frac{\frac{93}{100}}{\frac{7}{100}}\right)=$$

$$H_{TOT}=325+2(325)\left(\frac{93}{7}\right)$$

$$H_{TOT}=325+650\left(\frac{93}{7}\right)$$

$$H_{TOT}=\underline{8,960.7142\text{ m}}$$

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

V.- Aproxima la siguiente integral con la serie de Mc Laurin tomando los primeros 3 términos de la serie, donde $K_1 = \frac{b+d+1}{10}$, $K_2 = \frac{b+d+2}{10}$

$$K_1 = \frac{b+d+1}{10} = \frac{3+3+1}{10} = \frac{7}{10}$$

$$K_2 = \frac{b+d+2}{10} = \frac{3+3+2}{10} = \frac{8}{10}$$

5) $(c+d+1) \int_{K_1}^{K_2} \frac{\ln(x+1)}{x} dx =$

$$(4+3+1) \int_{0.7}^{0.8} \frac{\ln(x+1)}{x} dx =$$

$$8 \int_{0.7}^{0.8} \frac{\sum_{n=1}^{\infty} \frac{(-1)^{n+1} x^n}{n}}{x} =$$

$$8 \int_{0.7}^{0.8} \frac{1}{x} \left(\frac{(-1)^{1+1} x^1}{1} + \frac{(-1)^{2+1} x^2}{2} + \frac{(-1)^{3+1} x^3}{3} \right) dx =$$

$$8 \int_{0.7}^{0.8} \frac{1}{x} \left(x - \frac{x^2}{2} + \frac{x^3}{3} \right) dx = 8 \int_{0.7}^{0.8} \left(1 - \frac{x}{2} + \frac{x^2}{3} \right) dx = x - \frac{x^2}{2^2} + \frac{x^3}{3^2} \Big|_{0.7}^{0.8} =$$

$$8 \left(0.8 - \frac{0.8^2}{4} + \frac{0.8^3}{9} - \left(0.7 - \frac{0.7^2}{4} + \frac{0.7^3}{9} \right) \right) dx = \underline{0.650...}$$