Relatório de Resoluções

O código de cada membro pode ser consultado a seguir:

x_{04}: Beatriz Chessa	x_{11}: Luca Monaco
x_{05}: José Soares Jr.	x_{15}: Rodrigo Melendez
x_{06}: Maurício Damião	x_{18}: Matheus Cardoso
x_{08}: Pedro Lopes Silva	x_{20}: Gustavo Zequini
x_{09}: Rafael Maddalena	

Resolução (|| Questão: 2.8.1 || Relator: $\mathbf{x_{11}}$ || Revisor: $\mathbf{x_{18}}$ ||)

Evaluate the following sums:

a)$\sum_{i=1}^{10} i = 1+2+3+4+5+6+7+8+9+10 = 55$

b)$\sum_{k=2}^{6} 5.3^{k-2} - k = (5.3^0-2)+(5.3^1-3)+(5.3^2-4)+(5.3^3-5)+(5.3^4-6) = 3+12+41+130+399 = 585$

c)$\sum_{m=0}^{5} 2m+1 = (2.0+1)+(2.1+1)+(2.2+1)+(2.3+1)(2.4+1)(2.5+1) = 1+3+5+7+9+11 = 36$

d)$\sum_{i=0}^{2} 2^{2^i} = 2^{2^0}+2^{2^1}+2^{2^2} = 2^1+2^2+2^4 = 2+4+16 = 22$

e)$\sum_{i=1}^{10} 2 = 2+2+2+2+2+2+2+2+2+2 = 20$

f)$\sum_{j=1}^{4} \frac{j+1}{j} = \frac{1+1}{1} + \frac{2+1}{2}\frac{3+1}{3} + \frac{4+1}{4} = \frac{2}{1} + \frac{3}{2} + \frac{4}{3} + \frac{5}{4} = \frac{73}{12}$

■

Resolução (|| Questão: 2.8.2 || Relator: $\mathbf{x_{15}}$ || Revisor: $\mathbf{x_{20}}$ ||)

Expanda as seguintes somas:
a)$\sum_{k=-2}^{2} 2\sqrt{k+2} = 2\sqrt{-2+2} + 2\sqrt{-1+2} + 2\sqrt{0+2} + 2\sqrt{1+2} + 2\sqrt{2+2}$
b)$\sum_{i=0}^{3}(x+2i)^2 = (x+0)^2 + (x+2)^2 + (x+4)^2 + (x+6)^2$
c)$\sum_{k=1}^{n} a_{ki}b^{k+1} = a_{1i}b^2 + a_{2i}b^3 + ... + a_{ni}b^{n+1}$
d)$\sum_{i=0}^{n} f(x_i)\Delta x_i = f(x_0)\Delta x_0 + f(x_1)\Delta x_1 + ... + f(x_n)\Delta x_n$ ■

Resolução (|| Questão: 2.8.3 || Relator: $\mathbf{x_{18}}$ || Revisor: $\mathbf{x_{04}}$ ||)

Express the following sums in summation notation:
a) $4+8+12+16+\cdots+4n = \sum_{i=1}^{n} 4i$

b) $1^3+2^3+3^3+4^3+\cdots+n^3 = \sum_{i=1}^{n} i^3$

c) $1-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\cdots+(-1)^n\frac{1}{2n+1} = \sum_{i=0}^{n}(-1)^i\frac{1}{2i+1}$

d) $a_{i1}b_{1j} + a_{i2}b_{2j} + \cdots + a_{in}b_{nj} = \sum_{k=1}^{n} a_{ik}b_{kj}$

e) $3x + 9x^2 + 27x^3 + 81x^4 + 243x^5 = \sum_{i=1}^{5}(3x)^i$

f) $a_i^3 b_{i+3} + a_i^4 b_{i+4} + \cdots + a_i^p b_{i+p} = \sum_{k=3}^{p} a_i^k b_{i+k}$

g) $a_i^3 b_{i+3} + a_{i+1}^4 bi_{+4} + \cdots + a_{i+p}^{p+3} bi + p + 3 = \sum_{k=0}^{p} a_{i+k}^{k+3} b_{i+k+3}$

h) $81297 + 81495 + 81693 + 81891 = \sum_{i=0}^{3}(81297 + 198i)$ ■

Resolução (|| Questão: 2.8.4 || Relator: $\mathbf{x}_{20}$ || Revisor: $\mathbf{x}_{05}$ ||)

4) Compute the price index in Example 2.8.4, for n = 3,when:
$p_0^1 = 1$, $p_0^2 = 2$, $p_0^3 = 3$, $p_t^1 = 2$, $p_t^2 = 3$, $p_t^3 = 4$, $q^1 = 3$, $q^2 = 5$, $q^3 = 7$

$$\frac{\sum_{i=1}^{n} p_t^i . q^i}{\sum_{i=1}^{n} p_0^i q^i} \cdot 100 = \frac{2.3 + 3.5 + 4.7}{1.3 + 2.5 + 3.7} \cdot 100 = \frac{6 + 15 + 28}{3 + 10 + 21} \cdot 100 = \frac{49}{34} \cdot 100 \approx 144,12$$

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Resolução (|| Questão: 2.8.5 || Relator: $\mathbf{x}_{04}$ || Revisor: $\mathbf{x}_{08}$ ||))

Insert the appropriate limits of summation in the right-hand side of the following sums:

(a) $\sum_{k=1}^{10}(k-2)t^k = \sum_{m=} mt^{m+2}$

$\sum_{k=1}^{10}(k-2)t^k = -t^1 + 0 + t^3 + 2t^4 + 3t^5 + 4t^6 + 5t^7 + 6t^8 + 7t^9 + 8t^{10} = \sum_{m=-1}^{8} mt^{m+2}$

(b) $\sum_{n=0}^{N} 2^{n+5} = \sum_{j} 32.2^{j-1}$

$\sum_{n=0}^{N} 2^{n+5} = 2^5 + 2^6 + ... + 2^{N+5} = \sum_{j=1}^{N+1} 2^5.2^{j-1} = \sum_{j=1}^{N+1} 32.2^{j-1}$

■

Resolução (|| Questão: 2.8.6 || Relator: $\mathbf{x}_{05}$ || Revisor: $\mathbf{x}_{09}$ ||)

a)$\sum_{j=1}^{31} c_{ij}$: Soma de todas as pessoas que sairão do país i para os outros 30 países

b)$\sum_{i=1}^{31} c_{ij}$: Soma de todas as pessoas que entrarão no país j vindo dos outros 30 países
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Resolução (|| Questão: 2.8.7 || Relator: $\mathbf{x}_{06}$ || Revisor: $\mathbf{x}_{11}$ ||)

7. Decide which of the following equalities are generally valid
a) $\sum_{k=1}^{n} ck^2 = c\sum_{k=1}^{n} k^2 \therefore$ Always true

b) $(\sum_{i=1}^{n} a_i)^2 = \sum_{i=1}^{n} a_i^2 \therefore$ Generally not true

c)$\sum_{j=1}^{n} b_j + \sum_{j=n+1}^{N} b_j = \sum_{j=1}^{N} b_j \therefore$ Always true

d)$\sum_{k=3}^{7} 5^{k-2} = \sum_{k=0}^{4} 5^{k+1} \therefore$ Always true

e)$\sum_{i=0}^{n-1} a_{ij}^2 = \sum_{k=1}^{n} a_{(k-1)j}^2 \therefore$ Always true

f)$\sum_{k=1}^{n} \frac{a_k}{k} = \frac{1}{k} \sum_{k=1}^{n} a_k \therefore$ Generally not true
■