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1. Qual é o conjunto solução da equação exponencial $5^{X+2} = 125^{X}$?

$$5^{X+2} = 5^{X}5^{3}$$

$$5^{X+2} = 5^{3X}$$

Bases iguais, logo:

$$x + 2 = 3x$$

$$2 = 3x - x$$

$$2x = 2$$

R: $x = 1$

2. Determinar o conjunto solução da equação $3^{X}7^{X} = 441^{1/4}$?

$$3^{X}7^{X} = (3^{2}7^{2})^{1/4}$$

$$21^{X} = (21^{2})^{1/4}$$

$$21^{X} = 21^{2*1/4}$$

$$21^{X} = 21^{1/2}$$

Bases iguais, logo:

$$x = 1/2$$

3. Resolva:

a) $\sum_{l=1}^{10000} \sum_{i=1}^{n-5} \sum_{j=i+1}^{n/2} \sum_{k=1}^{n} 1$

$\sum_{k=1}^{n} 1$ = n-1+1 = n

$\sum_{j=i+1}^{n/2} n$ = n $\sum_{j=i+1}^{n/2} 1$ = n(n/2 – i-1+1) = n(n/2-i) = $\frac{n^2}{2}$ - in

$\sum_{i=1}^{n-5}(\frac{n^2}{2} - \text{in})$ = $\sum_{i=1}^{n-5}(\frac{n^2}{2})$ - $\sum_{i=1}^{n-5}(\text{in})$ = $(\frac{n^2}{2})\sum_{i=1}^{n-5} 1$ - n$\sum_{i=1}^{n-5}(\text{i})$

$(\frac{n^2}{2})\sum_{i=1}^{n-5} 1$ = $(\frac{n^2}{2})$(n-5-1+1) = $(\frac{n^2}{2})$(n-5) = $\frac{n^3}{2} - \frac{5\,n^2}{2}$ = $\frac{n^3 - 5\,n^2}{2}$

n$\sum_{i=1}^{n-5}(\text{i})$ = $\frac{(n-5)(n-4)}{2}$ = $\frac{(n^2-4n-5n+20)}{2}$ = $n\,\frac{(n^2-9n+20)}{2}$

$\frac{n^3 - 5\,n^2}{2} - \frac{(n^3-9n^2+20n)}{2}$ = $\frac{n^3 - 5\,n^2 - n^3+9n^2-20n}{2}$ = $\frac{4n^2-20n}{2}$ = $2n^2 - 10n$

$\sum_{l=1}^{10000} 2n^2 - 10n$ = $(2n^2 - 10n)$(10000-1+1) = $20000n^2 - 100000n$

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b) $\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6} = \frac{n(2n^2+n+2n+1)}{6} = \frac{(2n^3+3n^2+n)}{6}$

c) $\sum_{i=1}^{n} ia^i = \frac{na^{n+2}-a^{n+1}(1+n)+a}{(1-a)^2}$**, a≠1**