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Prontuário: **CB1990209**

Disciplina: **Matemática**

IFSP - Câmpus Cubatão

Tarefa Básica 1

Fatorial de um Número Natural

(Fotos nas páginas seguintes)

Exercícios 1 e 2:

D S T Q Q S S

Barça Básica 1 - 2º Bimestre

Exercícios

1-) Calcule

$$a-) 4! = 4 \cdot 3 \cdot 2 \cdot 1 = \boxed{24}_m$$

$$b-) 5! - 6! = 5! - 6 \cdot 5! \Rightarrow 5! \cdot (1 - 6) \Rightarrow 5! \cdot (-5) \Rightarrow 5 \cdot 4! \cdot (-5) \Rightarrow 5 \cdot 24 \cdot (-5) \Rightarrow 120 \cdot (-5) \Rightarrow \boxed{-600}_m$$

$$c-) \frac{9!}{6!} \Rightarrow \frac{9 \cdot 8 \cdot 7 \cdot 6!}{6!} \Rightarrow 9 \cdot 8 \cdot 7 = \boxed{504}_m$$

$$d-) \frac{98!}{100!} \Rightarrow \frac{98!}{100 \cdot 99 \cdot 98!} \Rightarrow \frac{1}{100 \cdot 99} \Rightarrow \boxed{\frac{1}{9900}}_m$$

2-) Efeito de $\frac{1}{n!} - \frac{n}{(n+1)!}$, determine:

$$\frac{1}{n!} - \frac{n}{(n+1) \cdot n!} \Rightarrow \frac{(n+1) - n}{(n+1) \cdot n!} \Rightarrow \frac{1}{(n+1) \cdot n!}$$

$$\therefore \frac{n! \cdot (n+1 - n)}{n! \cdot (n+1) \cdot n!} \Rightarrow \frac{n! \cdot 1}{n! \cdot (n+1) \cdot n!} \Rightarrow \frac{1}{(n+1) \cdot n!}$$

$$\therefore \frac{1}{n!} - \frac{n}{(n+1)!} = \boxed{\frac{1}{(n+1) \cdot n!}}_m$$

Exercícios 3 e 4:

3-) $\frac{(n!)^2 - (n-1)! \cdot n!}{(n-1)! \cdot n!}$, simplificando, obter-se:

$$\frac{(n!)^2 - (n-1)! \cdot n!}{(n-1)! \cdot n!} \Rightarrow \frac{(n!)^2}{(n-1)! \cdot n!} - \frac{(n-1)! \cdot n!}{(n-1)! \cdot n!}$$

$$\therefore \frac{(n!)^2}{(n-1)! \cdot n!} - \frac{1}{1} \Rightarrow \frac{n! \cdot \cancel{n!}}{(n-1)! \cdot \cancel{n!}} - \frac{1}{1} \Rightarrow \frac{n!}{(n-1)!} - \frac{1}{1} \therefore$$

$$\therefore \frac{n \cdot \cancel{(n-1)!}}{\cancel{(n-1)!}} - \frac{1}{1} \Rightarrow \frac{n}{1} - \frac{1}{1} \Rightarrow \boxed{n-1} \text{ m}$$

↳ Setor A

4-) $\frac{(n+2)! \cdot (n-2)!}{(n+1)! \cdot (n-1)!} = 4 \Rightarrow \frac{(n+2)!}{(n+1)!} \cdot \frac{(n-2)!}{(n-1)!} = 4 \therefore$

$$\therefore \frac{(n+2) \cdot \cancel{(n+1)!}}{\cancel{(n+1)!}} \cdot \frac{\cancel{(n-2)!}}{(n-1) \cdot \cancel{(n-2)!}} = 4 \therefore$$

$$\therefore \frac{(n+2) \cdot 1}{1 \cdot (n-1)} = 4 \Rightarrow \frac{(n+2)}{(n-1)} = 4 \therefore$$

$$\therefore n+2 = 4(n-1)$$

$$n+2 = 4n-4$$

$$2+4 = 4n-n$$

$$6 = 3n$$

$$\frac{6}{3} = n$$

$$\boxed{n=2} \rightarrow \text{Por}$$

↳ Setor A.

Exercícios 5 e 6:

$$5 \rightarrow \frac{(n+1)! - n!}{(n+1)!} = \frac{\pm}{n+1} \quad n=?$$

$$\frac{(n+1)! - n!}{(n+1)!} = \frac{\pm}{n+1} \Rightarrow \frac{1}{1} - \frac{n!}{(n+1)!} = \frac{\pm}{n+1} \therefore$$

$$\therefore 1 - \frac{n!}{(n+1) \cdot n!} = \frac{\pm}{n+1} \Rightarrow 1 - \frac{1}{n+1} = \frac{\pm}{n+1} \therefore$$

$$\therefore \frac{1}{1} = \frac{\pm}{n+1} + \frac{1}{n+1} \Rightarrow 1 = \frac{\pm + 1}{n+1} \Rightarrow \pm + 1 = 1(n+1)$$

$$\pm = n+1$$

$n=7$

$$6 \rightarrow (n-1)! \cdot [(n+1)! - n!] \text{ ?} = ?$$

$$(n-1)! \cdot [(n+1)! - n!] =$$

$$(n-1)! \cdot [(n+1) \cdot n \cdot (n-1)! - n \cdot (n-1)!] =$$

$$(n-1)! \cdot [(n-1)! \cdot [n \cdot (n+1) - n]] =$$

$$(n-1)! \cdot [(n-1)! \cdot [n \cdot (n+1 - 1)]] =$$

$$(n-1)! \cdot [(n-1)! \cdot [n \cdot n]] =$$

$$(n-1)! \cdot [(n-1) \cdot (n^2)] =$$

$$(n-1)! \cdot (n-1) \cdot (n \cdot n) =$$

$$[n \cdot (n-1)!] \cdot [n \cdot (n-1)!] =$$

$$(n! \cdot 1) \cdot (n!) = (n!)^2 \quad n \rightarrow \text{letra D}$$

Exercício 7:

D S T Q Q S S

$n = ?$

7-) $\frac{n! + (n-1)!}{(n+1)! - n!} = \frac{6}{25} \Rightarrow \frac{n(n-1)! + (n-1)!}{(n+1) \cdot n(n-1)! - n \cdot (n-1)!} = \frac{6}{25} \therefore$

$\therefore \frac{(n-1)! \cdot (n+1)}{(n+1) \cdot n - n} = \frac{6}{25} \therefore$

$\therefore \frac{(n+1)}{(n+1) \cdot n - n} = \frac{6}{25} \Rightarrow \frac{n+1}{n^2 + n - n} = \frac{6}{25} \therefore$

$\therefore \frac{n+1}{n^2} = \frac{6}{25} \Rightarrow 6n^2 = 25(n+1)$

$6n^2 = 25n + 25$

$6n^2 - 25n - 25 = 0$

$a \quad b \quad c$

$\Delta = (-25)^2 - 4 \cdot 6 \cdot (-25)$

$\Delta = 625 + 600$

$\Delta = 1225 \Rightarrow \sqrt{1225} = 35$

$\frac{25 \pm 35}{12} \Rightarrow n' = \frac{25+35}{12}$

$n' = \frac{60}{12} \Rightarrow n' = 5$

$n'' = \frac{25-35}{12}$

$n'' = -\frac{10}{12} \Rightarrow n'' = -\frac{5}{6}$

\downarrow

Não convém.

↳ Setra C.

Exercício 8:

8-) $21! - 221 \rightarrow$ Algoritmo dos Dezeros?

$$(21 \cdot 20 \cdot 19 \cdot 18 \cdot 17 \cdot 16 \cdot 15 \cdot 14 \cdot 13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot \underbrace{6!}_{6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}) - 221$$

$$(420 \cdot 342 \cdot 272 \cdot 210 \cdot 150 \cdot 110 \cdot 504 \cdot 720) - 221$$

$$51090942171709440000 - 221 = \therefore$$

$$\therefore = 510909421717084397 \boxed{7} 1$$

Dezera.

Algoritmo do Dezera = 7

Seta D