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Tarefa Básica - Fatorial

01.

$$a) 4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24 //$$

$$b) 5! - 6! = 5! - 6 \cdot 5! = 5! (1 - 6) = 5! \cdot (-5) = 120 \cdot (-5) = -600 //$$

$$c) \frac{9!}{6!} = \frac{9 \cdot 8 \cdot 7 \cdot 6!}{6!} = 504 //$$

$$d) \frac{98!}{100!} = \frac{98!}{100 \cdot 99 \cdot 98!} = \frac{1}{9900} //$$

02. $\frac{1 - n}{n! (n+1)!} = \frac{n+1 - n \cdot n!}{n! \cdot (n+1)!} = \frac{1}{(n+1)!} \quad | \text{Letra A}$

03. $\frac{(n!)^2 - (n-1)! \cdot n!}{(n-1)! \cdot n!} = \frac{n! \cdot n! - (n-1)! \cdot n!}{(n-1)! \cdot n!} = \frac{n \cdot (n-1)!}{(n-1)!} - 1 = n - 1 \quad | \text{Letra A}$

04. $\frac{(n+2)! (n-2)!}{(n+1)! (n-1)!} = 4$

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

$$\frac{n+2}{n-1} = 4 \Rightarrow n+2 = 4n-4$$

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

$$3n = 6$$

$$| n = 2 \quad | \text{Letra A} //$$

05. $\frac{(n+1)! - n!}{(n+1)!} = \frac{7}{n+1}$

$\frac{(n+1)! - n!}{(n+1)!} = \frac{7}{n+1}$

$1 - \frac{n!}{(n+1)!} = \frac{7}{n+1}$

$1 - \frac{1}{n+1} = \frac{7}{n+1}$

$\frac{n+1-1}{n+1} = \frac{7}{n+1}$

$n = 7 \Rightarrow n = 7$ Letra D

06. $\frac{(n-1)! [(n+1)! - n!]}{(n-1)! [(n+1) \cdot n! - n!]}$

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

$\frac{n \cdot (n-1)! \cdot (n!)}{n! \cdot n!} = \frac{(n!)^2}{(n!)^2}$ Letra D

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

07. $\frac{n! + (n-1)!}{(n+1)! - n!} = \frac{6}{25}$

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

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

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

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

$\Delta = 625 + 600$

$\Delta = 1225$

Letra C

$n_1 = 5$

$\frac{(n-1)! [n+1]}{n! [(n+1)-1]} = \frac{6}{25}$

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

$n = \frac{25 \pm \sqrt{\Delta}}{2 \cdot 6} = \frac{25 \pm 35}{12}$

$n_2 = \frac{-10}{12} = -\frac{5}{6}$

no. corr. m.

S	T	Q	Q	S	S	D
L/M	M/T	M/W	J/T	V/F	S/S	D/S

08. $21! - 221$

$$21! = 1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot 10 \cdot 11 \cdot 12 \cdot 13 \cdot 14 \cdot 15 \cdot 16 \cdot 17 \cdot 18 \cdot 19 \cdot 20 \cdot 21 = x$$

$$21! = x \cdot 10 \cdot (2 \cdot 5) \cdot 10$$

$$(2 \cdot 10)$$

$$x > 0, x \in \mathbb{Z}^* \quad 21! = x \cdot 1000$$

$$x \cdot 1000 = x000$$

$$12 \cdot 1000 = 12000$$

$$\begin{array}{r} 12000 \\ - 221 \\ \hline 11779 \end{array}$$

Então o algoritmo das dezenas de $21! - 221$

é 77

Letra D,

→ não importa o valor, se for multiplicado por 1000 e subtraído por 221, os últimos três dígitos serão 779.

BAERLOCHER

