Tarefa Basica - Fatorial

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1) a) $4! = 4.3.2.1 \rightarrow 24$,,

b) $5! - 6! = 5! - 6.5!$

*Fator comum $(5!)$

$5!(1-6) \rightarrow 5.24(-5) = -600$,,

c) $\frac{9!}{6!} = \frac{9.8.7.\cancel{6!}...}{\cancel{6!}} = 504$,,

d) $\frac{98!}{100!} = \frac{\cancel{98!}}{100.99.\cancel{98!}} = \frac{1}{9.900}$,,

2) $\frac{1}{x!} - \frac{x}{(x+1)!} = ?$

$$\to \frac{\frac{(x+1)!}{x!} - x}{(x+1)!}$$

$$\to \frac{\frac{(x+1)\cdot \cancel{x!}}{\cancel{x!}} - x}{(x+1)!}$$

$$\to \frac{\cancel{x} + 1 - \cancel{x}}{(x+1)!} = \frac{+1}{(x+1)}$$ //

Alternativa A)

data

3) $\dfrac{(n!)^2 - (n-1)!\, n!}{(n-1)!\, n!}$

$\to \dfrac{\cancel{n!}\,(n! - (n-1)!)}{(n-1)!\,\cancel{n!}}$

$\to \dfrac{n! - (n-1)!}{(n-1)!}$

$\to \dfrac{n.(n-1)! - (n-1)!}{(n-1)!}$

$\to \dfrac{\cancel{(n-1)!}\,(n-1)}{\cancel{(n-1)!}} = n-1$ //

Alternativa A)

data . .

4) $\dfrac{(n+2)!\,(n-2)!}{(n+1)!\,(n-1)!} = 4$

$\rightarrow \dfrac{(n+2).\cancel{(n+1)!}\,.\,\cancel{(n-2)!}}{\cancel{(n+1)!}\,(n-1).\cancel{(n-2)!}} = 4$

$\rightarrow \dfrac{(n+2)}{(n-1)} = 4$

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

$4n-4-n=2$

$3n=2+4 \rightarrow n=\dfrac{6}{3}$

$n=2$ //

Alternativa a) PAR

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

$n = ?$

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

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

$\dfrac{\cancel{n!}\,(n+\cancel{1}-\cancel{1})}{(n+1).\cancel{n!}} = \dfrac{7}{n+1}$

$\dfrac{n}{n+1} = \dfrac{7}{n+1}$

$n = 7$ //

Alternativa D)

6) $n \in \mathbb{N}$, $n \geq 1$

→ $(n-1)!\,[(n+1)! - n!] = ???$

→ $(n-1)!\,[(n+1)\,n! - n!]$

→ $(n-1)!\,[n!\,(n+1)\,n! - n!]$

→ $(n-1)!\,[n!\,(n+1-1)]$

→ $(n.(n-1)!).\,n!$

→ $n!\,.\,n! = (n!)^2$ //

Alternatwa D)

data

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

$\rightarrow n = ?$

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

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

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

$\rightarrow n + 1 = 6$

$\rightarrow n = 6 - 1$

Alternativa

$\rightarrow n = 5$ //

C)

8) algarismo das dezenas

$= 21! - 221$

- descobrir quantidade de 0 no fim do 21!

nº par . nº terminados com 5 = mul 10

Ex:

$2 . 5 = 10.$ →

$6 . 5 = 30$ → $(3 . 10)$

Resolução:

21 : 5, 15

21 : 10, 20

Terminou com 4 zeros

Então:

$\dots 0000$

$221 -$

779

C A

C D U

R: 7 dezenas

Alternativa D)