Tarefa Básica - Fatorial 29/06/2021

01) a) $4! = 4.3.2.1 = 24$

b) $5! - 6! = 5.4! - 6.5! = 120 - 720 = -600$

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

d) $\frac{98!}{100!} = \frac{98!}{100.99.98!} = \frac{1}{100.99} = \frac{1}{9.900}$

02) $\frac{1}{n!} - \frac{n}{(n+1)!} = \frac{1}{n!} - \frac{n}{(n+1).n!} = \frac{n+1-n}{(n+1).n!} = \frac{1}{n+1.n!} = \frac{1}{(n+1)!}$ (A)

03) $\frac{(n!)^2 - (n-1)!n!}{(n-1)!.n!} = \frac{(n!).(n!) - (n-1)!n!}{(n-1)!.n!} = \frac{n![n! - (n-1)!]}{n!(n-1)} =$

$n\frac{(n-1)! - (n-1)!}{(n-1)!} = \frac{n-1.\cancel{(n-1)!}}{\cancel{(n-1)!}} = n-1$ (A)

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

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

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

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

$n+2 = 4.(n-1)$
$n+2 = 4n-4$
$n+2-4n = -4$
$n-4n = -4-2$
$-3n = -6$
$n = \frac{-6}{-3} = 2$ ← PAR (A)

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

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

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

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

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

$n = 7$ (D)

06) $n \in N$, $n \geq 1$, então $(n-1)! [(n+1)! - n!] = ?$

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

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

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

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

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

$25.(n+1) = 6.n^2$

$25^{x1}n + 25^{x1} - 6n^{2} = 0$

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

$\Delta = -b^2 - 4.a.c$

$\Delta = -(-25)^2 - 4.6.(-25)$

$\Delta = 625 + 600$

$\Delta = 1225$

$\Delta = 35$

$x = \frac{-b \pm \sqrt{\Delta}}{2.a}$

$x' = \frac{-(-25)+35}{12} = \frac{60}{12} = 5$ //

$x'' = \frac{25-35}{12} = \frac{-10^{:2}}{12^{:2}} = -\frac{5}{6}$ //