Sabrina Medeiros de Lima CT II 317

Fatorial de um número natural

1- a) $4! = 4.3.2.1 = 24$

b) $5! - 6! = 5! - 6.5! = -5.5! = -5.120 = -600$

c) $\frac{9!}{6!} = \frac{9.8.7.6!}{6!} = 9.8.7 = 504$

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

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

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

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

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

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

$\frac{n+2}{n-1} = 4$ $n+2 = 4(n-1)$ $n+2 = 4n-4$ $n-4n = -4-2$ $-3n = -6$ $n = -2$ → Para R. A

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

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

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

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

R. D

6- $(n-1)!\,[(n+1)!-n!]$

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

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

$(n-1)!(n.n) = (n-1)! = n.n!$

$(n-1)!\,n = n! = (n-1)!.n.n!$

$n!.n! = (n!)^2$ R. D

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

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

$\dfrac{n+1}{n.n} = \dfrac{6}{25}$ $25(n+1) = 6n^2$

$25(n+1) = -6n^2 = 0$

$\dfrac{n+1}{n^2} = \dfrac{6}{25}$ $25n+25-6n^2 = 0$

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

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

$6n+5n-30n-25 = 0$

$n(6n+5)-5(6n+5) = 0$

$(6n+5).(n-5) = 0$ R. C