Beatriz Bastos Borges Nº03 CT11350.

Tarefa Básica

1. $\binom{8}{3} = \frac{8!}{3!5!} \to \frac{8.7.6.\cancel{5!}}{3.2.1.\cancel{5!}} \to \frac{336}{6} \to \boxed{56}$

$\boxed{\text{Alternativa B}}$

2. $\binom{200}{198} \to \frac{200!}{198!2!} \to \frac{200.199.\cancel{198!}}{\cancel{198!}2.1} \to \frac{\cancel{200}.199}{\cancel{2}} \to \boxed{19900}$

$\boxed{\text{Alternativa A}}$

3. $\binom{n-1}{2} = \binom{n+2}{4}$

I $\frac{(n-1)!}{2!(n-3)!} = \frac{(n+1)!}{4!(n-3)!} \to \frac{(n-1)!\,4!\,\cancel{(n-3)}!}{2!\,\cancel{(n-3)}!} = (n+1)n!$

$\frac{(n-1)!\,4.3.\cancel{2!}}{\cancel{2!}} = (n+1).n.(n-1)! \to 12 = \frac{(n^2+n)\cancel{(n-1)}!}{\cancel{(n-1)}!}$

$n^2+n-12=0$ $S = 3+(-4) = (-1)$

$P = 3.(-4) = (-12)$

II $n<K \to n-1<2 \to n<3 \to \{1,2,3\}$

$\boxed{V=\{1,2,3\}}$

............/............/............

4. $\binom{20}{13}+\binom{20}{14}$

De acordo com uma das propriedades dos coeficientes binominais, quando ocorre soma de dois consecutivos do triângulo, a resposta estará em baixo

$$\binom{20}{13}+\binom{20}{14}=\boxed{\underbrace{\binom{21}{14}\rightarrow\binom{21}{7}}_{\text{complementares}}}$$ $\boxed{\text{Alternativa C}}$

$14+7=21$

5. $\underbrace{\binom{n}{0}+\binom{n}{1}+\binom{n}{2}+\dots\binom{n}{n}}_{\text{Soma de linha}}=\boxed{2^n}$

↳ o resultado será igual a 2 elevado ao numerador

6. a) $\sum_{p=0}^{10}\binom{10}{p}\rightarrow\binom{10}{0}+\binom{10}{1}+\dots\binom{10}{10}$ → soma da linha 10

$2^{10}=\boxed{1024}$

b) $\sum_{p=0}^{9}\binom{10}{p}\rightarrow\binom{10}{0}+\binom{10}{1}+\dots\binom{10}{9}$ → Soma da linha 10 $-\binom{10}{10}$

$2^{10}-\binom{10}{10}=1024-1=\boxed{1023}$

c) $\sum_{p=2}^{9} \binom{9}{p} \rightarrow \binom{9}{2} + \binom{9}{3} + \dots \binom{9}{9} \rightarrow$ soma da linha $9 - \binom{9}{0} - \binom{9}{1}$

$2^9 - \binom{9}{0} - \binom{9}{1} \rightarrow 512 - 1 - 9 = \boxed{502}$

d) $\sum_{p=4}^{10} \binom{p}{4} \rightarrow \binom{4}{4} + \binom{5}{4} + \dots \binom{10}{4} \rightarrow$ Soma na coluna

$\binom{11}{5} \rightarrow \frac{11!}{5!6!} \rightarrow \frac{11.10.9.8.7.\cancel{6!}}{5.4.3.2.1.\cancel{6!}} \rightarrow \frac{55440}{120} = \boxed{462}$

e) $\sum_{p=5}^{10} \binom{p}{5} \rightarrow \binom{5}{5} + \binom{6}{5} + \dots \binom{10}{5} \rightarrow$ Soma na coluna

$\underbrace{\binom{11}{6} = \binom{11}{5}}_{\text{complementares}} \rightarrow \boxed{462}$

$6+5=11$

7. $\sum_{k=0}^{m} \binom{m}{k} = 512$

$\binom{m}{0} + \binom{m}{1} + \dots \binom{m}{m} \rightarrow$ soma da linha m

$2^m = 512 \rightarrow \cancel{2}^m = \cancel{2}^9 \rightarrow \boxed{m = 9}$

$\boxed{\text{Alternativa E}}$