[illegible] Ferreira CP 1810964

TURMA 348

I- $\binom{8}{3} = \frac{8!}{3!(8-3)!} = \frac{8!}{3.2.1\,(5)!} = \frac{8.7.6.\cancel{5!}}{6.\cancel{5!}} = \frac{336}{6} = \boxed{56}$ (LETRA "B")

II- $\binom{200}{198} = \frac{200!}{198!\,(200-198)!} = \frac{200.199.\cancel{198!}}{\cancel{198!}\,.\,2!} = \frac{39\text{K}800}{2} = \boxed{19\text{K}900}$ (LETRA "A")

III- $\binom{N-1}{2} = \binom{N+1}{4}$

$N-1+2=4$ ou $N+1+4=2$

$N-1=4-2$ ou $N+1=2-4$

$N-1=2$ ou $N+1=-2$

$N=2+1$ ou $N=-2+1$

$\boxed{N=3}$ ou $\cancel{\boxed{N=-1}}$

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

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IV- $\binom{20}{13} + \binom{20}{14}$

$$\frac{280}{182} + \frac{260}{182} \overset{(\div 2)}{=} \frac{540}{182} \overset{(\div 13)}{=} \frac{270}{91} =$$

13 · 14	2
13 · 7	13
1 · 1	7
	182

$$\frac{20.76}{7} \cong \frac{21}{7}$$

(LETRA "C")

(ARREDONDADO)

V. $\binom{N}{0} + \binom{N}{1} + \binom{N}{2} + \dots + \binom{N}{N}$

2^N (Propriedade)

VI. a) $\displaystyle\sum_{p=0}^{10} \binom{10}{p} = \binom{10}{0} + \binom{10}{1} + \binom{10}{2} + \binom{10}{3} + \binom{10}{4} + \dots + \binom{10}{10}$

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

b) $\displaystyle\sum_{p=0}^{9} \binom{10}{p} = \binom{10}{0} + \binom{10}{1} + \binom{10}{2} + \binom{10}{3} + \binom{10}{4} + \dots + \binom{10}{9}$

Linha 10 - $\binom{10}{10}$

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

c) $\displaystyle\sum_{p=2}^{9} \binom{9}{p} = \binom{9}{2} + \binom{9}{3} + \binom{9}{4} + \dots + \binom{9}{9}$

$2^9 - \binom{9}{0} - \binom{9}{1}$

$\binom{9}{1} = \frac{9!}{1!\,8!} = \frac{9 \cdot 8!}{1\,8!} = \frac{9}{1} = 9$

$2^9 - 1 - 9$

$512 - 1 - 9 = \boxed{502}$

i) $\sum_{p=4}^{10} \binom{p}{4} = \binom{4}{4} + \binom{5}{4} + \binom{6}{4} + \binom{7}{4} + \binom{8}{4} + \binom{9}{4} + \binom{10}{4}$

$\binom{10}{4} = \binom{11}{5} = \frac{11!}{5!} = \frac{11!}{5!(11-5)} = \frac{11!}{5!\,.\,6!} = \frac{11.10.9.8.7.\cancel{6!}}{720\,.\,\cancel{6!}} = \frac{55k440}{120}$

$\boxed{462}$

&) $\sum_{p=5}^{10} \binom{p}{5} = \binom{5}{5} + \binom{6}{5} + \binom{7}{5} + \binom{8}{5} + \binom{9}{5} + \binom{10}{5}$ =

$\binom{10}{5} = \binom{11}{6} = \frac{11!}{6!(11-6)!} = \frac{11!}{6!\,5!} = \frac{11.10.9.8.7.6.\cancel{5!}}{720\;\;\cancel{5!}} = \frac{332k640}{720} = \boxed{462}$

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VII - SENTENÇA: $\sum_{K=0}^{m} \binom{m}{K} = 512$

$\sum_{K=0}^{9} \binom{9}{0}$

$$\begin{array}{r|l} 512 & 2 \\ 256 & 2 \\ 128 & 2 \\ 64 & 2 \\ 32 & 2 \\ 16 & 2 \\ 8 & 2 \\ 4 & 2 \\ 2 & 2 \\ 1 & 1 \end{array} \Bigg\} 2^9$$

$\sum_{K=0}^{9} \binom{9}{K} = \binom{9}{0} + \binom{9}{1} + \binom{9}{2} + \binom{9}{3} + \binom{9}{4} + \binom{9}{5} + \dots + \binom{9}{9}$

$2^9 = \boxed{512}$