$$\sum_{p=1}^{8} \binom{9}{p} = \binom{9}{1} + \binom{9}{2} + \binom{9}{3} + \binom{9}{4} \dots \binom{9}{8}$$

P DE 1 A 9 LINHA 9 $-\binom{9}{0} - \binom{9}{9}$

$2^9 - 1 - 1$

$512 - 2 = 510$

TAREFA BÁSICA COEFICIENTES BINOMIAIS

1) $\binom{8}{3} = \frac{8.7.6}{3.2.1} = \frac{336}{6} = 56$

ALTERNATIVA (B)

2) $\binom{200}{198} = \frac{200.199.198!}{198!(200-198)!} = \frac{200.199}{2!} = \frac{39.800}{2}$

$\downarrow$

19900

ALTERNATIVA (A)

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

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

$2N=4$ $\quad$ $2N=2$ $\quad$ $V=\{1,2\}$

$N=\frac{4}{2}=2$ $\quad$ $N=\frac{2}{2}=1$

④ $\binom{20}{13} + \binom{20}{14} = \binom{21}{14}$

2 CONSECUTIVOS DA LINHA 20 ENTÃO N+1 E MANTEM O MAIOR VALOR DE K

⑤ $\binom{N}{0} + \binom{N}{1} + \binom{N}{2} + \dots + \binom{N}{N}$

SEGUNDO A REGRA ISSO É UMA SOMA DA LINHA "N" LOGO A RESPOSTA SERÁ 2 ELEVADO AO VALOR DE "N" ENTÃO O RESULTADO É: 2^N

⑥ ⓐ $\sum_{p=0}^{10} \binom{10}{p} = \binom{10}{0} + \binom{10}{1} + \dots + \binom{10}{10} = 2^{10}$

$2^{10} = 1024$

Ⓑ $\sum_{p=0}^{9} \binom{10}{p} = \binom{10}{0} + \binom{10}{1} + \dots \binom{10}{9} = 2^{10} - \binom{10}{10}$

$2^{10} - 1 = 1024 - 1 = 1023$

(C) $\sum_{p=2}^{9}\binom{9}{p}$ $\binom{9}{2}+\binom{9}{3}+\dots+\binom{9}{9}=2^9-\binom{9}{0}-\binom{9}{1}$

$2^9-1-9=512-10=502$

(D) $\sum_{p=4}^{10}\binom{p}{4}=\binom{4}{4}+\binom{5}{4}+\binom{6}{4}+\binom{7}{4}+\binom{8}{4}+\binom{9}{4}+\binom{10}{4}=\binom{11}{5}$

$\binom{11}{5}=\frac{11!}{5!(11-5)!}=\frac{11!}{5!.6!}=\frac{11.10.9.8.7.6!}{5!.6!}=\frac{11.10.9.8.7}{5!}$

$\frac{55.440}{120}=462$

(E) $\sum_{p=5}^{10}\binom{p}{5}=\binom{5}{5}+\binom{6}{5}+\dots\binom{10}{5}=\binom{11}{6}$

COMPLEMENTAR A ANTERIOR

$\binom{11}{6}=\frac{11!}{6!(11-6)!}=\frac{11!}{6!.5!}=\frac{55440}{120}=462$

(7) $\sum_{k=0}^{m}\binom{m}{k}=512$ $\binom{m}{0}+\dots+\binom{m}{k=m}=2^m$

$m=9$

$\binom{9}{0}+\binom{9}{1}+\dots\binom{9}{9}=2^9=512$

ALTERNATIVA (E)

512	2
256	2
128	2
64	2
32	2
16	2
8	2
4	2
2	2
1	

2^9