NOME: João Victor
TURMA: CT11348
PRONTUÁRIO: 1990527

Tarefa Básica.

1.

$$\binom{8}{3} = \frac{8!}{3!\,5!} = \frac{8.7.6.5!}{3.2.1\,5!} = \frac{336}{6} = \underline{\underline{56}}$$ (B)

2.

$$\binom{200}{198} = \frac{200!}{198!\,2!} = \frac{200.199.198!}{198!\,2} = \frac{39800}{2}$$

$$= \underline{\underline{19900}}$$ (A)

3.

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

$$\frac{(N-1)!}{2!(N-1-2)!} = 0$$

$$\frac{(N-1).(N-2).(N-3)!}{2\ (N-3)!} = 0$$

$$N^2 - 2N - N + 2 = 0$$

$$N^2 - 3N + 2 = 0$$

$$1 + 2 = 3$$
$$1 \cdot 2 = 2$$

$$\frac{(N-1)!}{2!(N-3)!} = \frac{(N+1).N(N-1)!}{4!(N-3)!}$$

$$1 = \frac{N^2+N}{24}$$

$$2N^2 + 2N = 24$$

$$N^2 + N - 12 = 0$$

$$3 + (-4) = -1$$
$$3 \cdot (-4) = -12$$

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

Lo -4 NÃO CONVÉM

__/__/__

S T Q Q S S D

4-

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

Soma de dois consecutivos

$\binom{K}{N} + \binom{K}{N+1} = \binom{K+1}{N+1}$

$\binom{20}{13} + \binom{20}{14} = \binom{20+1}{13+1} = \binom{21}{14}$ (C)

$\binom{21}{14} = \binom{21}{7}$ → complementares

$14 + 7 = 21$

5-

$\binom{N}{0} + \binom{N}{1} + \binom{N}{2} + \cdots \binom{N}{N} = 2^N$

6-

A) $\sum_{P=0}^{10} \binom{10}{P} = \binom{10}{0} + \binom{10}{1} + \binom{10}{2} + \binom{10}{3} + \binom{10}{4} + \binom{10}{5}$

$+ \binom{10}{6} + \binom{10}{7} + \binom{10}{8} + \binom{10}{9} + \binom{10}{10} = 2^{10}$

$2^{10} = 1024$

S T Q Q S S D

__/__/__

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

$+ \binom{10}{5} + \binom{10}{6} + \binom{10}{7} + \binom{10}{8} + \binom{10}{9} = 2^{10} - 1$

$\binom{10}{10} = 1$ $\qquad 2^{10} - 1 = \underline{1023}$

C) $\sum_{p=2}^{9} \binom{9}{p} = \binom{9}{2} + \binom{9}{3} + \binom{9}{4} + \binom{9}{5} + \binom{9}{6}$

$+ \binom{9}{7} + \binom{9}{8} + \binom{9}{9} = 2^9 - 1 - 9 = 512 - 10 = \underline{502}$

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

$1 + 5 + 15 + 35 + 70 + 126 + 210$

$= \underline{462}$

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

$1 + 6 + 21 + 56 + 126 + 252 = \underline{462}$

$\sum_{k=0}^{7-m} \binom{m}{k} = \binom{m}{0} + \binom{m}{1} \cdots \binom{m}{m} = 2^m = 512$

$2^m = 512 \qquad 2^9 = 512 \qquad \underline{m = 9}$ (E)