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Lista Coeficientes Binomiais - Triângulo de Pascal/Tartaglia

Tarefa Básica

1) $\binom{8}{3} = \frac{8!}{3!(8-3)!} = \frac{8!}{3!5!} = \frac{8.7.6.\cancel{5!}}{3.2.1.\cancel{5!}} = \frac{336}{6} = 56$ B)

2) $\binom{200}{198} = \frac{200!}{198!(200-198)!} = \frac{200!}{198!\,2!} = \frac{200.199.\cancel{198}}{\cancel{198}!\,2!} = \frac{39.800}{2} = 19.900$ A)

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

$4(n-1) = 2(n+1)$

$4n - 4 = 2n + 2$

$2n = 6$

$n = \frac{6}{2} = 3$

$n <= 3 \rightarrow \{1,2,3\}$ C)

No exercício 4 fiquei confusa pois na teoria de aula foi mostrado de um jeito, mas no gabarito a resposta não condizia com o resultado.

4) $\binom{20}{13} + \binom{20}{14} = \frac{21}{14} = \frac{21}{7}$

5) $\binom{n}{0} + \binom{n}{1} + \binom{n}{2} + \dots + \binom{n}{n} =$

soma na linha $n \to 2^n$

6) a) $\sum_{p=0}^{10} \binom{10}{p} = 2^{10} = 1024$

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

linha 10 $- \binom{10}{10}$

$2^{10} - 1$

$1024 - 1 = 1023$

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

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

$512 - 10 = 502$

d) $\sum_{p=4}^{10} \binom{p}{4} = \binom{4}{4} + \binom{5}{4} + \dots + \binom{10}{4} = \frac{11}{5}$

$\binom{11}{5} = \frac{11!}{5!(11-5)!} = \frac{11!}{5!\,6!} = \frac{11.10.9.8.7.\cancel{6!}}{5.4.3.2.1\cancel{6!}} =$

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

7) $\sum_{k=0}^{n} \binom{n}{k} = 512 \rightarrow 2^9 = 512$

$n = 9$

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

soma na linha 9 $\rightarrow 2^9 = 512$ E)

6) a) $\sum_{p=5}^{10} \binom{p}{5} = \binom{5}{5} + \binom{6}{5} + \binom{7}{5} + \dots + \binom{10}{5} = \binom{11}{6}$

$\binom{11}{6} = \frac{11!}{6!(11-6)!} = \frac{11!}{6!\,5!} = \frac{11.10.9.8.7.\cancel{6!}}{\cancel{6!}\,5.4.3.2.1} = \frac{55440}{120} = 462$