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• Coeficiente Binominais e Triângulo de Pascal

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

2) $\frac{200!}{198!\,2!} = \frac{200.199.\cancel{198!}}{\cancel{198!}.2.1} = \frac{39.800}{2} = \boxed{19.900}$ (A)

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

$N-1 > 2$

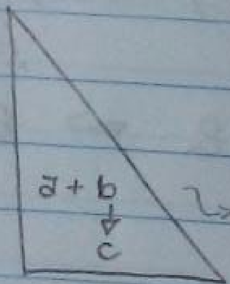
$N > 2+1$

$N > 3$

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

$\Downarrow$

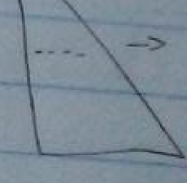
$\binom{21}{14}$



→ a soma de vizinhos de uma linha resulta no de baixo

Resposta: $\binom{21}{14}$

5) $\binom{N}{0} + \binom{N}{1} + \binom{N}{2} \dots \binom{N}{N} = \boxed{2^N}$



→ a soma da linha do triângulo resulta em uma potência de "2"

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

b - $\sum_{p=0}^{9} \binom{10}{p} = 2^{10} - 1 = \boxed{1023}$ //

c - $\sum_{p=2}^{9} \binom{9}{p} = 2^{9} - 1 - 9 = \boxed{502}$ //

d - $\sum_{p=4}^{10} \binom{p}{4} = \frac{11!}{5!6!} = \frac{11.10.9.8.7.\cancel{6}}{5.4.3.2.1.\cancel{6}} = \frac{55440}{120} = \boxed{462}$ //

e - $\sum_{p=5}^{10} \binom{p}{5} = \frac{11!}{6!5!}$ = complementar ao anterior = $\boxed{462}$ //

7) $\sum_{k=0}^{m} \binom{m}{k} = \binom{m}{0} + \binom{m}{1} + \binom{m}{2} \dots \binom{m}{m} = 2^m$

$2^m = 512 \Rightarrow 2^m = 2^9$ (E)