

// Lista 10 - Coeficientes Binomiais //

$$\textcircled{1} \binom{8}{3} = \frac{8!}{3!(8-3)!} = \frac{8!}{3!5!} = \frac{8 \cdot 7 \cdot 6 \cdot \cancel{5!}}{3! \cdot \cancel{5!}} = \frac{336}{6} = 56$$

Letra B

$$\textcircled{2} \binom{200}{198} = \frac{200!}{198!(200-198)!} = \frac{200!}{198!2!} = \frac{200 \cdot 199 \cdot \cancel{198!}}{\cancel{198!} \cdot 2!} = \frac{39800}{2} = 19900$$

Letra A

\textcircled{5} Sabe-se que está somando na linha n . E pela propriedade, a soma completa da linha será 2^n .

$$\textcircled{6} a - \sum_{p=0}^{10} \binom{10}{p} = \binom{10}{0} + \binom{10}{1} + \dots + \binom{10}{10} \rightarrow \text{Linha 10}$$

$$\hookrightarrow 2^{10} = 1024$$

$$b - \sum_{p=0}^9 \binom{10}{p} = \binom{10}{0} + \binom{10}{1} + \dots + \binom{10}{9} \rightarrow \text{Linha 10}$$

$$\text{Linha 10} \binom{10}{10} = 2^{10} - 1 = 1024 - 1 = 1023$$

$$c - \sum_{p=2}^9 \binom{9}{p} = \binom{9}{2} + \binom{9}{3} + \dots + \binom{9}{9} \rightarrow \text{Linha 9}$$

$$\text{Linha 9} \binom{9}{0} - \binom{9}{1} = 2^9 - 1 - 9$$
$$512 - 10 = 502$$

$$\textcircled{7} \sum_{k=0}^m \binom{m}{k} = 512 \Rightarrow \binom{m}{0} + \binom{m}{1} + \dots + \binom{m}{m}$$

$$2^m = 512$$

$$512 = 2^9$$

$$2^m = 2^9$$

$$m = 9$$