Tarefa básica-

1- $\binom{8}{3} = \frac{8!}{3!(8-3)!} = \frac{8.7.6.5}{3.2.1.5} = 56$ (B)

2- $\binom{200}{198} = \frac{200!}{198!(200-198)!} = \frac{200.199.198}{198.2.1} = 19900$ (A)

3- $\binom{n-1}{2} = \binom{n+1}{4}$ $\quad \frac{n-1=n+1}{2}$ $\quad n-1+n+1=2+4$

$2n=6$

$n=3$

$n=\{2,3\}$

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

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

linha n

6- a) $\sum_{p=0}^{10} \binom{10}{p} = \binom{10}{0} + \binom{10}{1} + \binom{10}{2} + \dots + \binom{10}{10} = 2^{10} = 1024$

b) $\sum_{p=0}^{9} \binom{10}{p} = \binom{10}{0} + \binom{10}{1} + \binom{10}{2} + \binom{10}{3} + \dots + \binom{10}{9} = 2^{10} - 1 = 1023$

c) $\sum_{p=2}^{9} \binom{9}{p} = \binom{9}{2} + \binom{9}{3} + \binom{9}{4} + \dots + \binom{9}{8} = 2^9 - 10 = 502$

d) $\sum_{p=4}^{10} \binom{4}{4} + \binom{5}{4} + \binom{6}{4} + \dots + \binom{10}{4} = \binom{11}{5} \Rightarrow \frac{11}{5!(11-5)!} =$

$$\frac{11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot \cancel{6}}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 \cdot \cancel{6}} = \frac{55440}{120} = 462$$

e) $\sum_{p=5}^{10} \binom{p}{5} \rightarrow \binom{5}{5} + \binom{6}{5} + \binom{7}{5} + \ldots + \binom{10}{5} = \binom{11}{6}$

$\binom{11}{6} \rightarrow \frac{11}{6!(11-6)!} = \frac{11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot \cancel{5}}{6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 \cdot \cancel{5}} = \frac{332640}{720} = 462$

7- $\sum_{k=0}^{m} \binom{m}{k}$ $2^5 = 32$ x $2^6 = 64$ x

$2^7 = 128$ x $2^8 = 256$ x $2^9 = 512$ (e)