Coefficienti binomiali

verifica le seguenti identità dichiarando le condizioni di esistenza		
1	$\binom{5}{2} = \binom{5}{3}$	Vale
2	$\binom{6}{4} = \frac{3}{7}\binom{7}{3}$	Vale
3	$\binom{12}{7} + \binom{12}{8} = \binom{13}{8}$	Vale
4	$\binom{12}{7} + \binom{12}{8} = \binom{12}{5} + \binom{12}{3}$	Non vale
5	$\binom{9}{2}\binom{7}{5} = \binom{4}{2}\binom{9}{5}$	Vale
6	$3!\binom{7}{3} = 4!\binom{7}{4}$	Non vale
7	$\binom{11}{9} + \binom{11}{10} = \binom{12}{2}$	Vale
8	$7\binom{12}{7} = 12\binom{11}{6}$	Vale
9	$\binom{10}{5} - \binom{10}{4} = -\frac{3}{5}\binom{10}{6}$	Non vale
10	$\binom{7}{6} = \frac{7!}{5(4!)^2}\binom{4}{3}$	Vale
11	$\frac{3}{4}\binom{4}{3} = \frac{5}{6}\binom{6}{5}$	Non vale
12	$\binom{7}{2}\binom{5}{1} = 5\left[1 + \binom{6}{3}\right]$	Vale
13	$\frac{5}{8}\binom{8}{5} + \binom{4}{1} = \frac{2}{3}\binom{4}{2} + \binom{7}{4}$	Vale
14	$\binom{6}{5} - \binom{5}{4} = (24 - 4!)!$	Vale
15	$\binom{8}{4} + \binom{6}{4} = \frac{10}{7}\binom{7}{3} + \binom{7}{4}$	Vale
16	$\binom{7}{4} + 3! = \frac{4}{3}\binom{6}{4} + \binom{6}{3} + 0!$	Vale
17	$\binom{n}{5} = \binom{4}{n}$	Non vale
18	$\binom{n}{8} = \binom{n-1}{7} + \binom{n-1}{8}$	Vale se $n \geq 9$
19	$\binom{4}{n} = \binom{4}{4-n}$	Vale se $n \leq 4$
20	$\binom{7}{n} = \binom{7}{n+8}$	Non vale

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21	$\binom{2n-1}{n}+\binom{2n-1}{n-1}=2\binom{2n}{n}$	Non vale
22	$\frac{n}{3}\binom{n-1}{11}=4\left[\binom{n+1}{13}-\binom{n}{13}\right]$	Vale se $n \geq 13$
23	$\binom{n}{2}\binom{n-2}{1}=\frac{n!}{2(n-3)!}$	Vale se $n \geq 3$
24	$\binom{4}{n}-\binom{4}{n-1}=\frac{2-n}{2}\binom{4}{n}$	Vale solo se $n = 3$
25	$\binom{4}{4-n}=\frac{5-n}{n}\binom{4}{n-1}$	Vale se $1 \leq n \leq 4$
26	$\binom{n}{3}\binom{n-3}{n-5}=10\binom{n}{n-5}$	Vale se $n \geq 5$
27	$n\binom{2n-2}{n}=2(n-1)\binom{2n-3}{n-1}$	Vale se $n \geq 2$
28	$2\left[\binom{5}{n}-\binom{6}{n}\right]=n\binom{6}{n}$	Vale solo se $n = 0$
29	$\frac{5!}{n}\left[\binom{n+1}{5}-\binom{n}{4}\right]=n^4-10\,n^3+35\,n^2-50\,n+24$	Vale se $n \geq 4$
30	$\binom{n-1}{k}=\binom{n-1}{k-1}$	Vale se $n = 2k \geq 2$
31	$\binom{n+1}{k+1}:\binom{n-1}{k-1}=\frac{n+1}{k}$	Vale solo se $n = k+1 \geq 2$
32	$n\binom{n-1}{k-1}+k\binom{n}{k+1}=k\binom{n+1}{k+1}$	Vale se $n \geq k+1 \geq 2$
33	$\binom{n}{k+1}-\binom{n+1}{k+1}=3\binom{n}{k}$	Non vale
34	$n\binom{n-1}{k}=(n-3k)\binom{n}{k}$	Vale solo se $k = 0$
35	$\binom{n+1}{k+1}+\binom{n-1}{k-1}=\frac{k+n}{n}\binom{n}{k}+\binom{n}{k+1}$	Vale se $n \geq k+1 \geq 2$
36	$\binom{n+1}{k+1}=\frac{n(k+1)}{k(n+1)}\binom{n-1}{k-1}$	Vale solo se $n = k \geq 1$
37	$\binom{n+1}{k+1}=\frac{n(n+1)}{k(k+1)}\binom{n-1}{k-1}$	Vale se $n \geq k \geq 1$
38	$\binom{n}{k}-\binom{n}{k-1}=\frac{n-2k+1}{k}\binom{n}{k-1}$	Vale se $n \geq k \geq 1$
39	$\binom{n}{k+1}=\frac{n-2k-1}{k+1}\binom{n}{k}+\frac{n}{k}\binom{n-1}{k-1}$	Vale se $n \geq k+1 \geq 2$
40	$\binom{n}{h}:\binom{n}{k}=\binom{n-k}{h}:\binom{n-h}{k}$	Vale se $n \geq h+k$