(1) Berechne:

a) $\binom{0}{0}=1$ b) $\binom{1}{0}=1$ c) $\binom{1}{1}=1$ d) $\binom{2}{0}=1$

e) $\binom{4}{2}=6$ f) $\binom{5}{2}=10$ g) $\binom{6}{1}=6$ h $\binom{6}{6}=1$

(2) Ergänze:

$\binom{0}{0}=1$

$\binom{1}{0}=1$ $\binom{1}{1}=1$

$\binom{2}{0}=1$ $\binom{2}{1}=2$ $\binom{2}{2}=1$

$\binom{3}{0}=1$ $\binom{3}{1}=3$ $\binom{3}{2}=3$ $\binom{3}{3}=1$

(3) Berechne die Elemente der 20. Zeile des Pascal'schen Dreiecks.

$\binom{20}{0}=1$ $\binom{20}{1}=20$ $\binom{20}{2}=190$ $\binom{20}{3}=1140$

$\binom{20}{4}=4845$ $\binom{20}{5}=15504$ $\binom{20}{6}=38760$ $\binom{20}{7}=77520$

$\binom{20}{8}=125970$ $\binom{20}{9}=167960$ $\binom{20}{10}=184756$ $\binom{20}{11}=\binom{20}{9}$

(4) Zeige, dass gilt:

a)
$$\binom{8}{2} = \binom{8}{6}$$
$$\frac{8!}{2!\cdot 6!} = \frac{8!}{6!\cdot 2!}$$

b)
$$\binom{n}{k} = \binom{n}{n-k}$$
$$\frac{n!}{k!\cdot(n-k)!} = \frac{n!}{(n-k)!\cdot k!}$$