35. Hausübung

7) Insgesamt: 5 aus 20 $= \binom{20}{5} = 15504$

Alle 4 Asse + 1 der restlichen 16 Karten = 16 Möglichkeiten

$$\frac{16}{15504} = 0{,}001 = \underline{\underline{0{,}1\,\%}}$$

8) gSmZ: $n = 4^{12} = 16\,777\,216$

6 richtig,	6 zufällig	:	$4^6 = 4096$
7 "	5 "	:	$4^5 = 1024$
8 "	4 "	:	$4^4 = 256$
9 "	3 "	:	$4^3 = 64$
10 "	2 "	:	$4^2 = 16$
11 "	1 "	:	$4^1 = 4$
12 "	0 "	:	$4^0 = 1$

$\Big\}$ + $g = 5461$

$$P(\text{Test bestanden}) = \frac{5461}{16\,777\,216} = 0{,}0003 = \underline{\underline{0{,}03\,\%}}$$

9) Permutation: $5! = \underline{\underline{120}}$

27b) $A=(1|2|3)$, $B=(-4|-6|7)$, $C=(0|-2|9)$, $r=12$

$$\overrightarrow{BC} = \begin{pmatrix}4\\4\\2\end{pmatrix} \parallel \begin{pmatrix}2\\2\\1\end{pmatrix}$$

$$\left|\begin{pmatrix}2\\2\\1\end{pmatrix}\right| = \sqrt{9} = 3$$

$$\vec{a} = 12 \cdot \frac{\begin{pmatrix}2\\2\\1\end{pmatrix}}{3} = \begin{pmatrix}8\\8\\4\end{pmatrix}$$

$$A + \vec{a} = \begin{pmatrix}9\\10\\7\end{pmatrix} \qquad A - \vec{a} = \begin{pmatrix}-7\\-6\\-1\end{pmatrix}$$

$$\underline{\underline{P=(9|10|7),\ Q=(-7|-6|-1)}}$$

28c) $A=(-2|-1|5)$, $B=(4|5|11)$, $n=3$

$$\frac{1}{3}\overrightarrow{AB} = \frac{1}{3}\begin{pmatrix}6\\6\\6\end{pmatrix} = \begin{pmatrix}2\\2\\2\end{pmatrix} = \vec{a}$$

$$A + \vec{a} = \begin{pmatrix}0\\1\\7\end{pmatrix} \qquad A + 2\vec{a} = \begin{pmatrix}2\\3\\9\end{pmatrix}$$

$$\underline{\underline{T_1=(0|1|7),\ T_2=(2|3|9)}}$$

29 a) $A=(2|-1|3)$, $B=(6|3|1)$, $C=(4|4|2)$

$$S=\frac{A+B+C}{3}=\begin{pmatrix}4\\2\\2\end{pmatrix} \qquad \underline{S=(4|2|2)}$$

+ 30 b) $A=(-1|3|-4)$, $C=(-2|0|2)$, $S=(-1|2|4)$

$$S=\frac{A+B+C}{3} \quad |\cdot 3$$

$$3S=A+B+C \quad |-A-C$$

$$B=3S-A-C=\begin{pmatrix}-3\\6\\12\end{pmatrix}-\begin{pmatrix}-1\\3\\-4\end{pmatrix}-\begin{pmatrix}-2\\0\\2\end{pmatrix}=\begin{pmatrix}0\\3\\14\end{pmatrix}$$

$\underline{B=(0|3|14)}$