b) Wir dividieren das Polynom $f(x) = x^4 - 31x^2 + 42x + 72$ durch den Linearfaktor $(x+2)$. Identisch mit der Berechnung des Funktionswertes -2.

	1	0	-31	42	72
-2		-2	4	54	-192
	1	-2	-27	96	-120

$f(-2) = -120$

$$\frac{x^4 - 31x^2 + 42x + 72}{x+2} = x^3 - 2x^2 - 27x + 96 = \frac{-120}{x+2}$$

$$x^4 - 31x^2 + 42x + 72 = (x+2)(x^3 - 2x^2 - 27x + 96) = -120$$

$$(x^4 - 31x^2 + 42x + 72) : (x+2) = x^3 - 2x^2 - 27x + 96$$

$$\begin{array}{l}
-(x^4 + 2x^3) \\
\hline
\quad -2x^3 - 31x^2 \\
\quad -(-2x^3 - 4x^2) \\
\hline
\qquad -27x^2 + 42x \\
\qquad -(-27x^2 - 54x) \\
\hline
\qquad\qquad 96x + 72 \\
\qquad\qquad -(96x + 192) \\
\hline
\qquad\qquad\quad -120
\end{array}$$

e)

$$(x^3 - 3x^2 + 4) : (x^2 - 5x + 6) = x + 2$$

$$\begin{array}{l}
-(x^3 - 5x^2 + 6x) \\
\hline
\quad 2x^2 - 6x + 4 \\
\quad -(2x^2 - 10x + 12) \\
\hline
\qquad 4x - 8
\end{array}$$

Also gilt: $\dfrac{x^3 - 3x^2 + 4}{x^2 - 5x + 6} = x + 2 \; \dfrac{4x - 8}{x^2 - 5x + 6}$