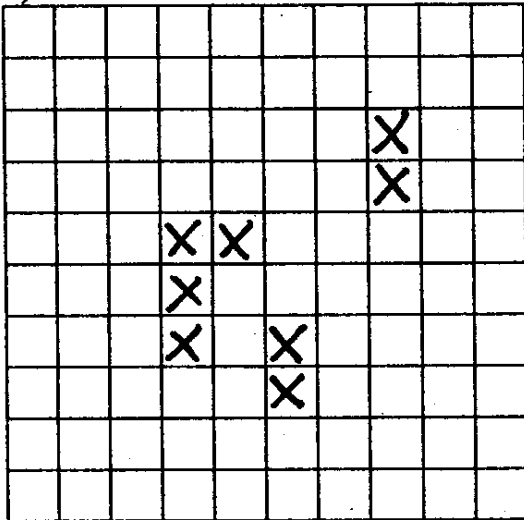


Bildanalyse und Bildverstehen
Lösungen zu Übungsblatt 3

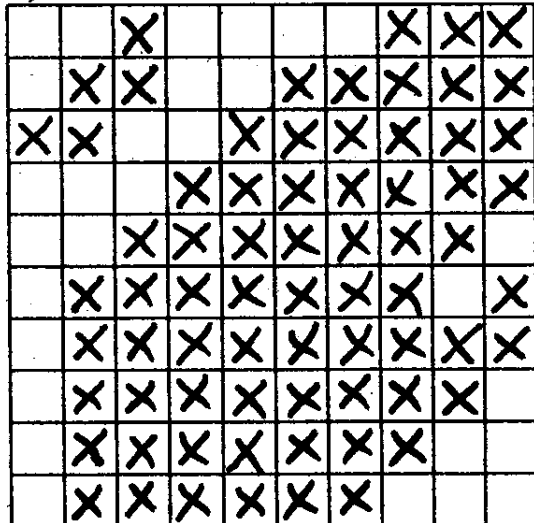
Aufgabe 1

Es ist $O_B = D_{-B} E_B$ (zuerst ist also die Erosion auszuführen), $S_B = E_{-B} D_B$.

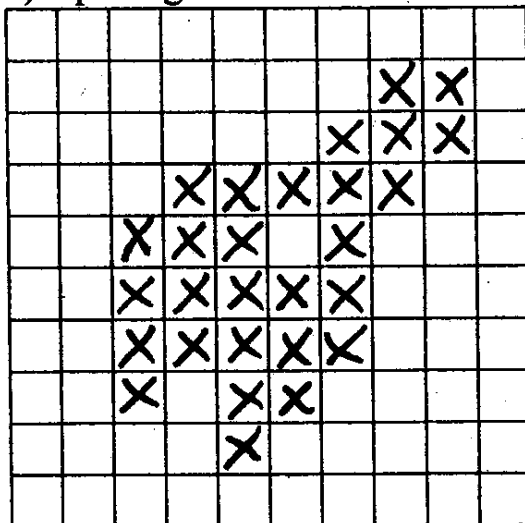
a) Erosion



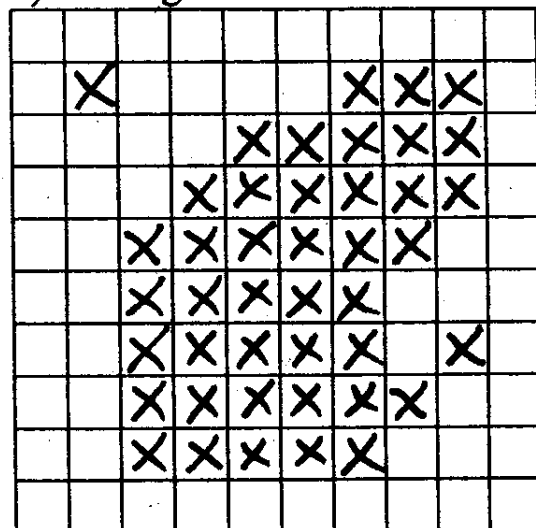
b) Dilatation



c) Opening



d) Closing



Aufgabe 2

$$D_B(f)(x) = \max \{ f(x+b) + B(b) \mid b \in D(B) \}$$

$$E_B(f)(x) = \min \{ f(x+b) - B(b) \mid b \in D(B) \}$$

$$C(f)(x) = M - f(x)$$

$$\begin{aligned}
\mathbf{CD}_B \mathbf{C}(f)(x) &= M - \max \{ \mathbf{C}f(x+b) + \mathbf{B}(b) \mid b \in D(\mathbf{B}) \} \\
&= M - \max \{ (M - f(x+b)) + \mathbf{B}(b) \mid b \in D(\mathbf{B}) \} \\
&= M - \max \{ M - (f(x+b)) - \mathbf{B}(b) \mid b \in D(\mathbf{B}) \} \\
&= M - [M - \min \{ f(x+b) - \mathbf{B}(b) \mid b \in D(\mathbf{B}) \}] \\
&= \min \{ f(x+b) - \mathbf{B}(b) \mid b \in D(\mathbf{B}) \} \\
&= \mathbf{E}_B(f)(x)
\end{aligned}$$

Aufgabe 3

Lösungsbild:

