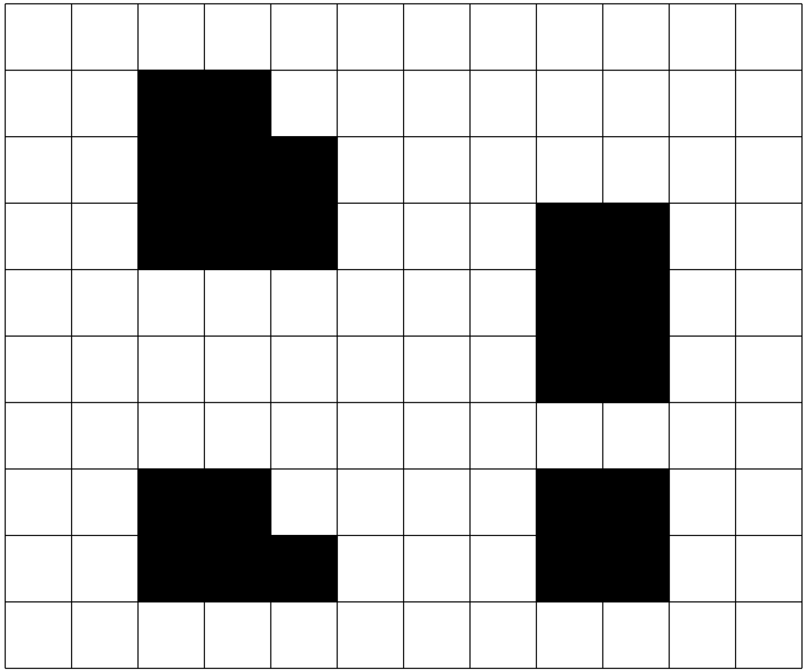
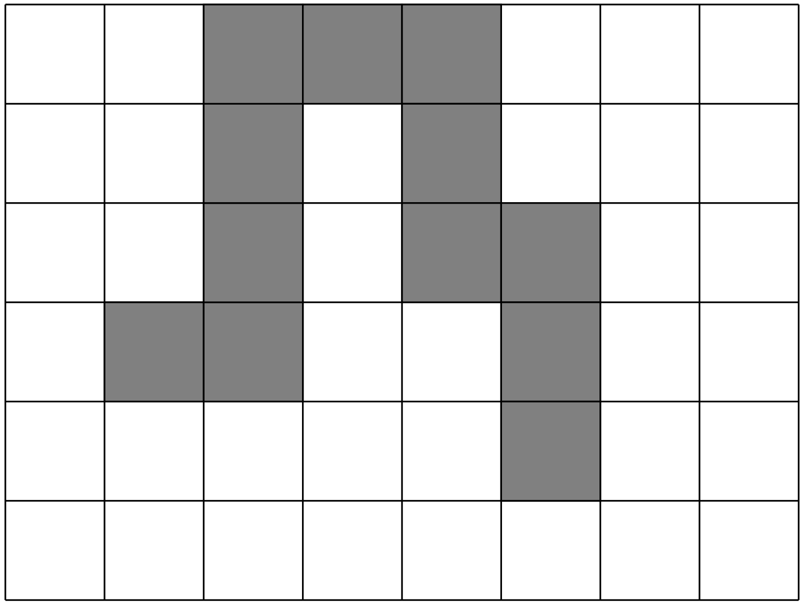
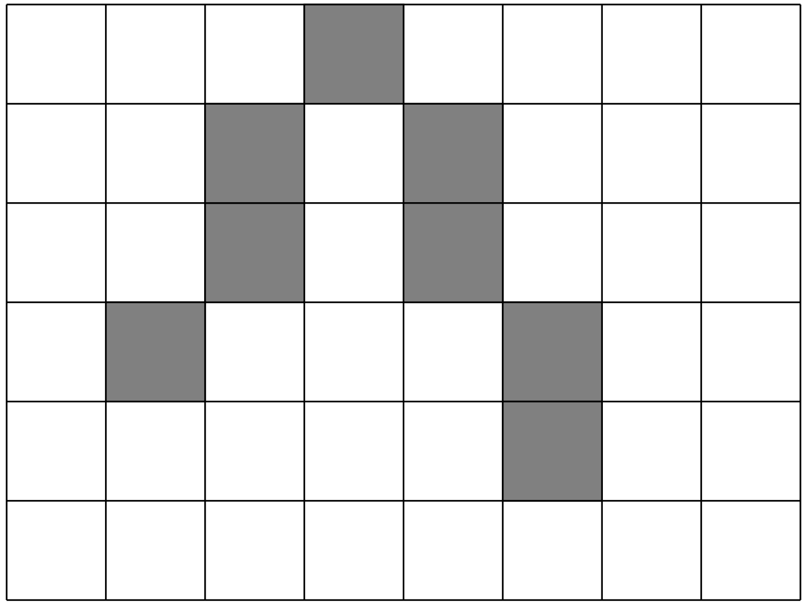


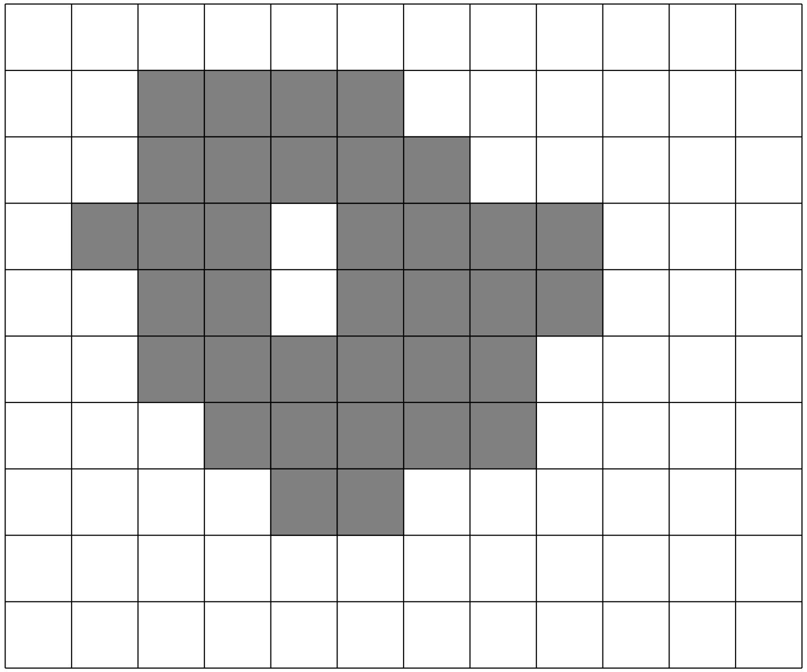
		1	1								
		1	1	1							
		1	1	1				3	3		
								3	3		
								3	3		
		4	4					2	2		
		4	4	4				2	2		

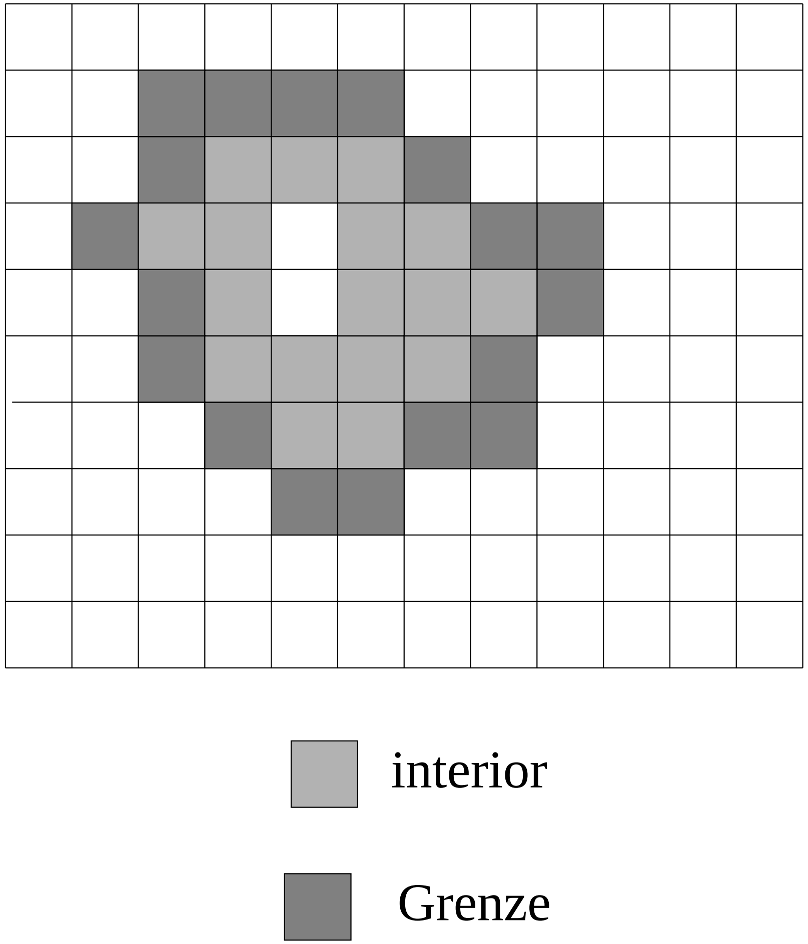


4 connected



8 connected




interior
Grenze

Recursive Connected Components Algorithm

```
initialize all pixels as unlabeld
L := 0;
for alle Zeilen
  for alle Spalten
    if pixel is 1 ∧ pixel is unlabeled then
      L++;
      labelIt( pixel, L)
    fi
  endfor
endfor
```

labelIt(pixel, L)

```
label pixel as L
for qixel is neigbor of pixel
  if qixel is 1 ∧ qixel is unlabeled then
    labelIt( qixel, L)
  fi
endfor
```

Sequential Connected Components

```
initialize empty equivalence table

for alle Zeilen (von oben nach unten)
  for alle Spalten (von links nach rechts)
    if pixel is 1 then
      if either upper or left neighbors has label then
        copy the label
      else if both neighbors have same label then
        copy the label
      else if both neighbors have different label then
        copy the upper neighbors label
        copy enter the labels in the equivalence table
      else
        assign new label to this pixel
        enter this label in the equivalence table
      fi
    fi
  endfor
endfor
```

Find the lowest label for each equivalent set in the equivalence table

Scan the picture and replace each label by the lowest lable in its equivalent set

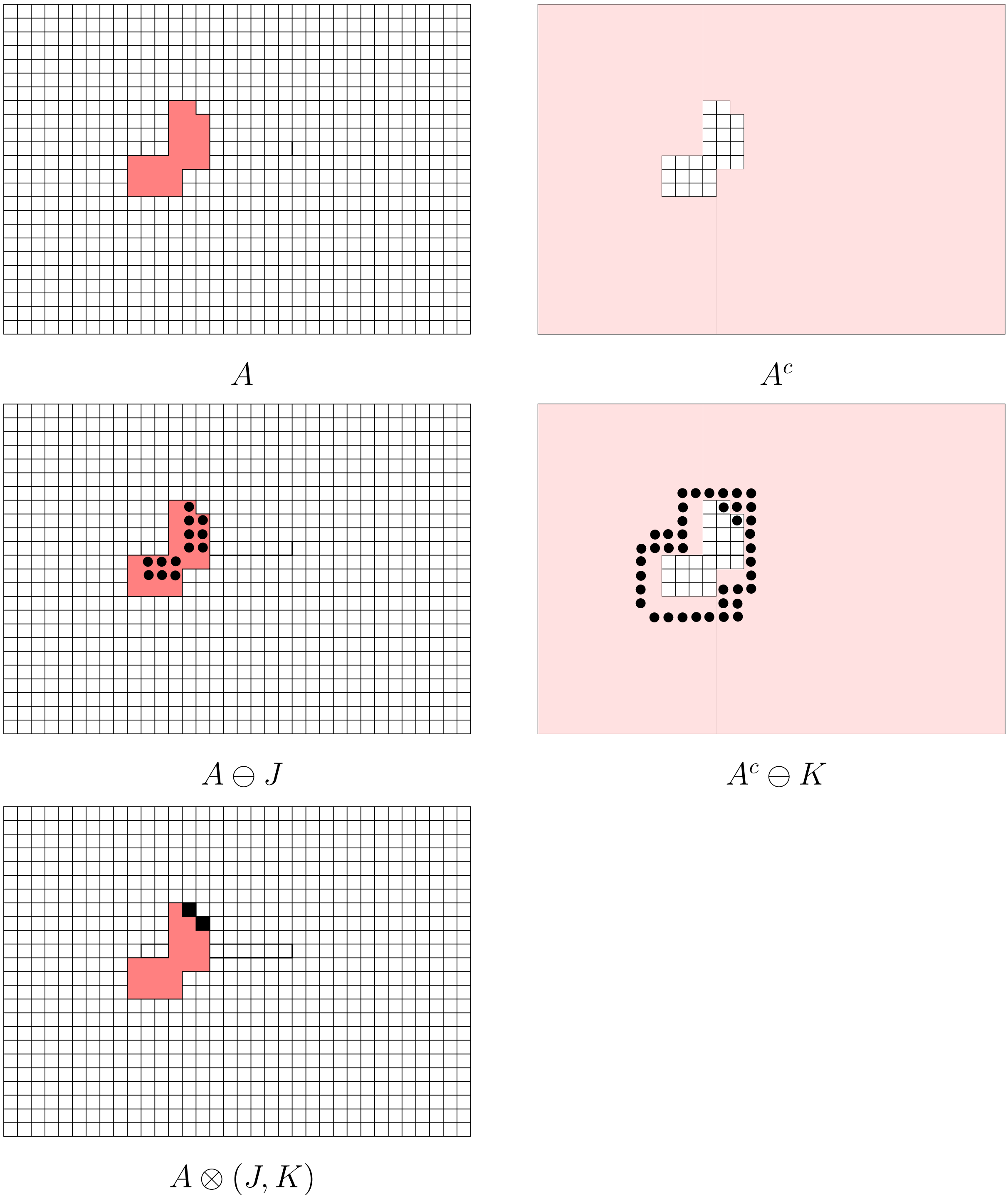
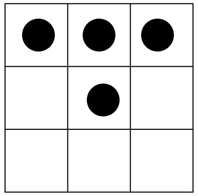
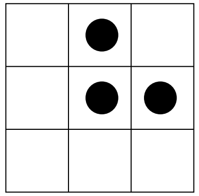
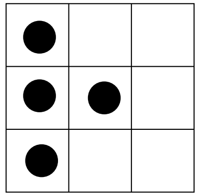
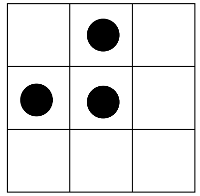
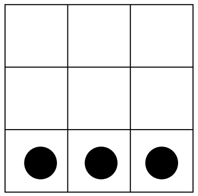
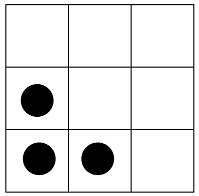


Abbildung 1: Beispiel fuer hit-and-miss: upper-right-hand corner


J1

J2

J3

J4

K1

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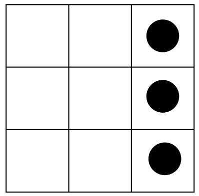
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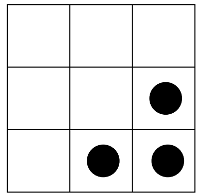
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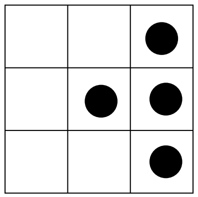
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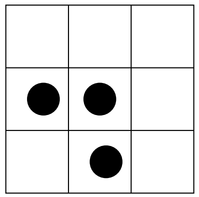
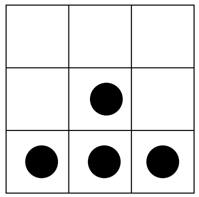
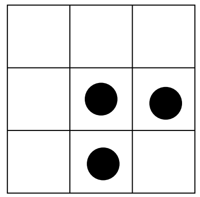

J6

J7

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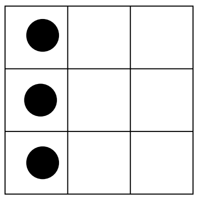
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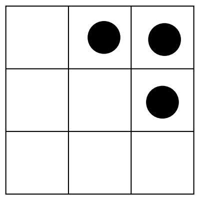
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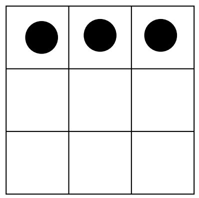
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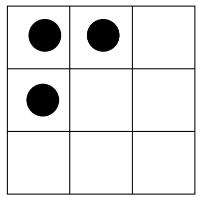
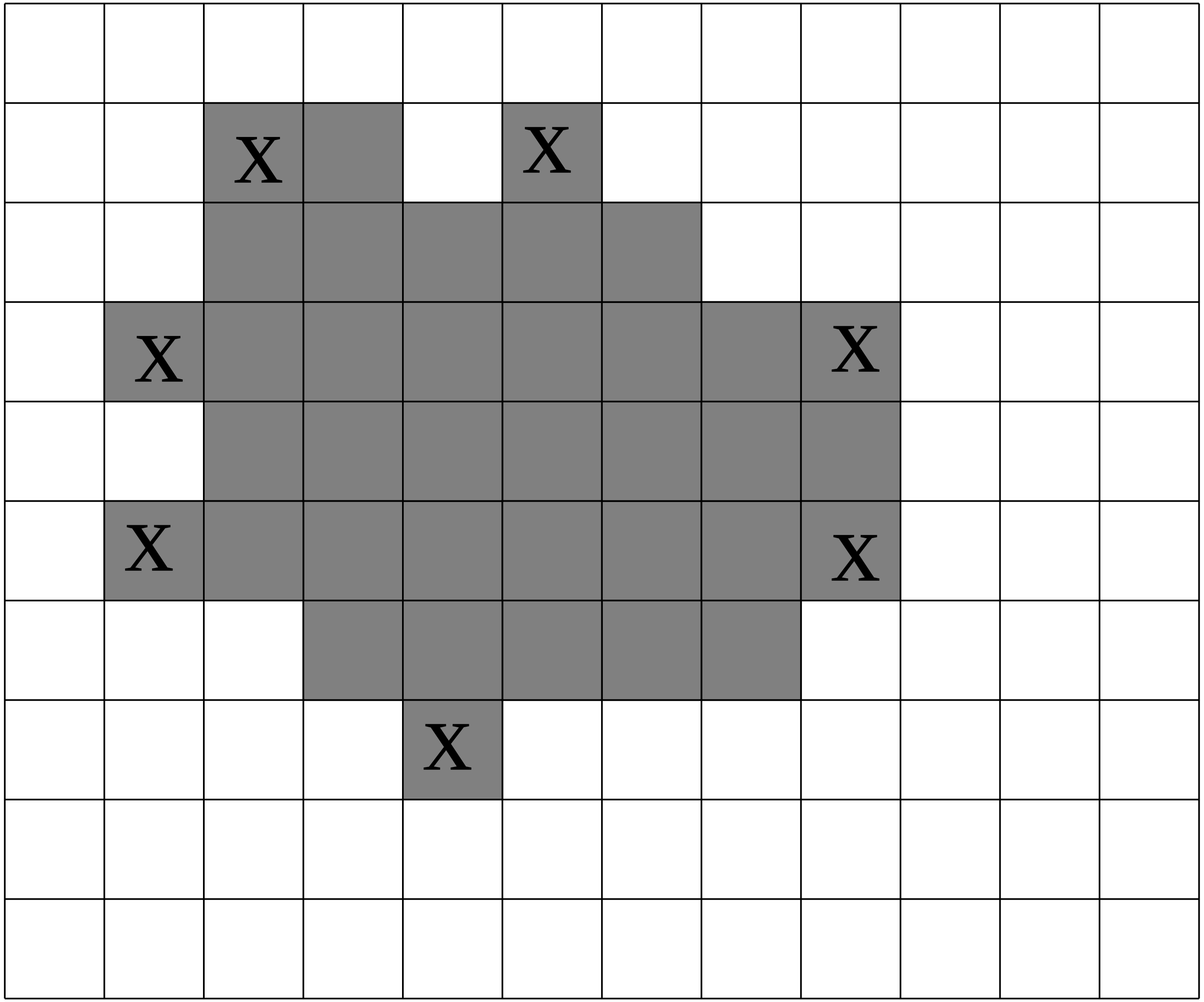
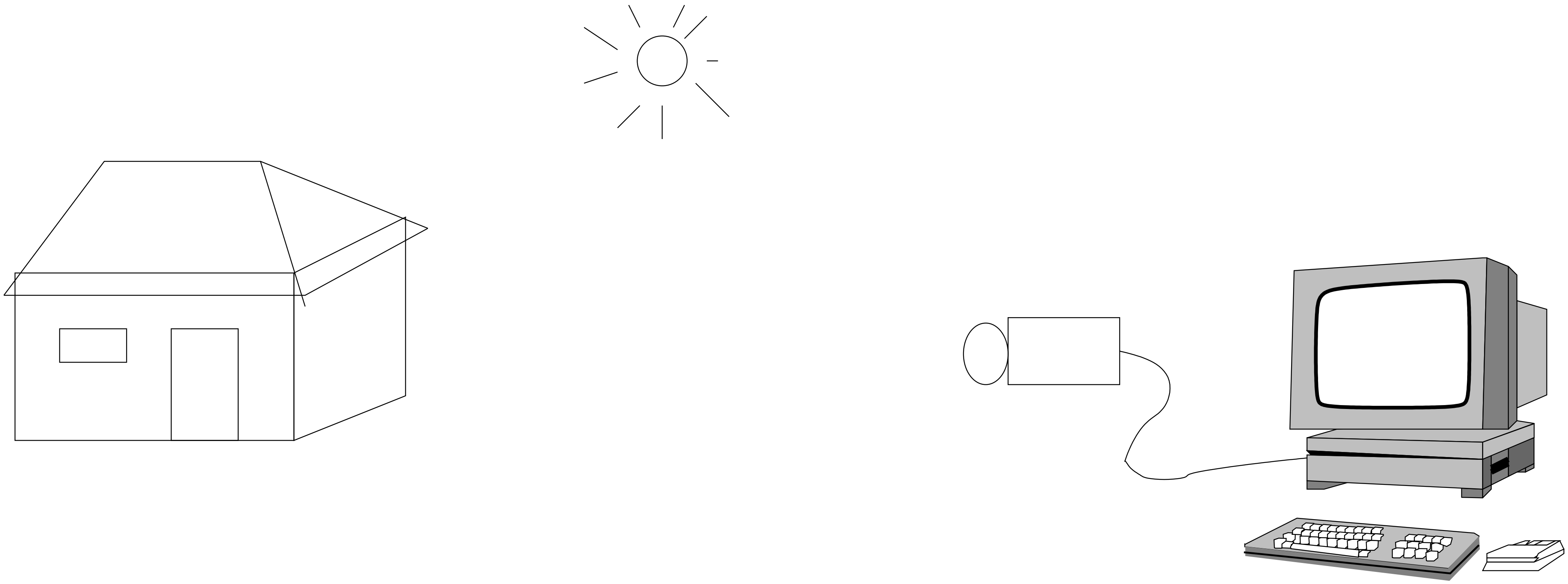
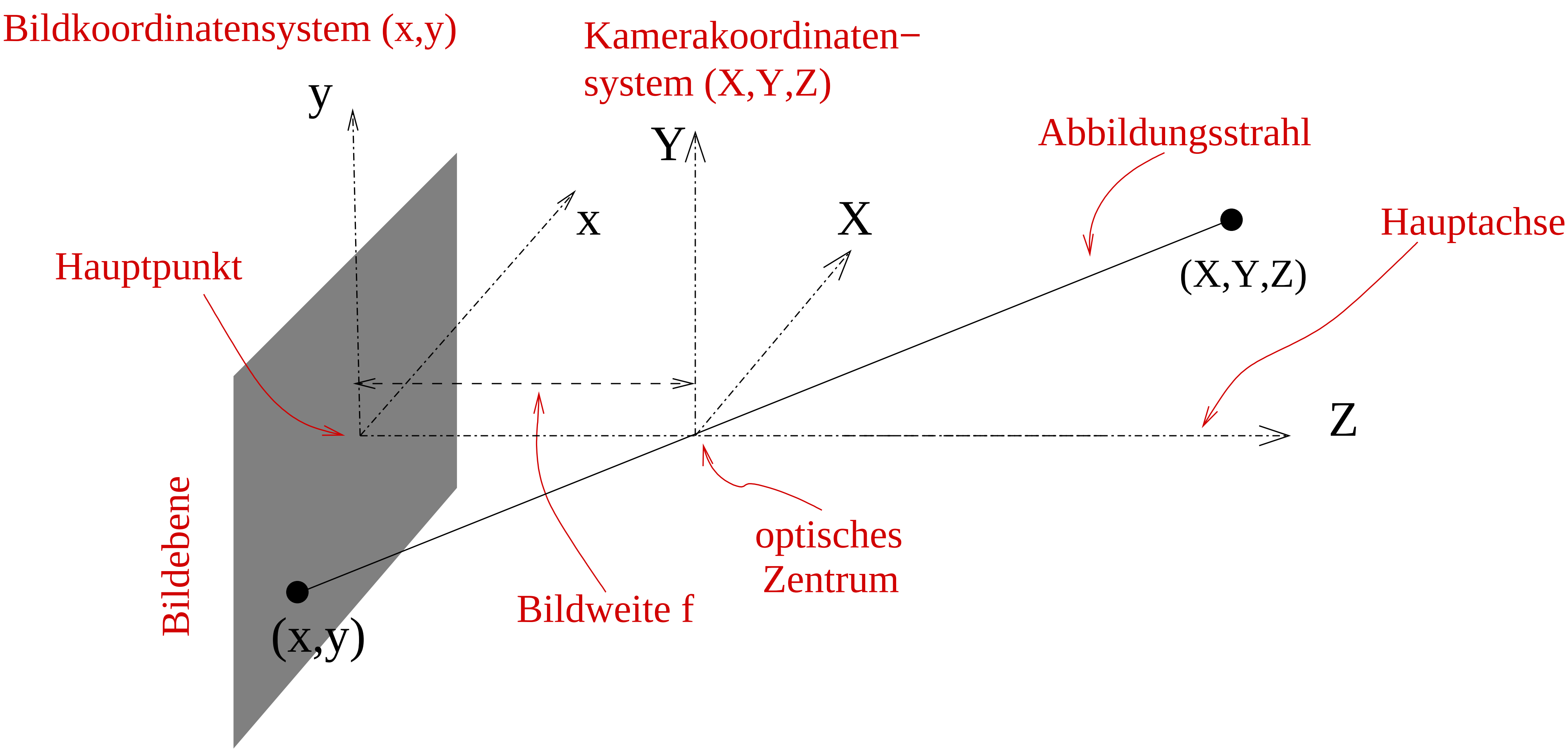
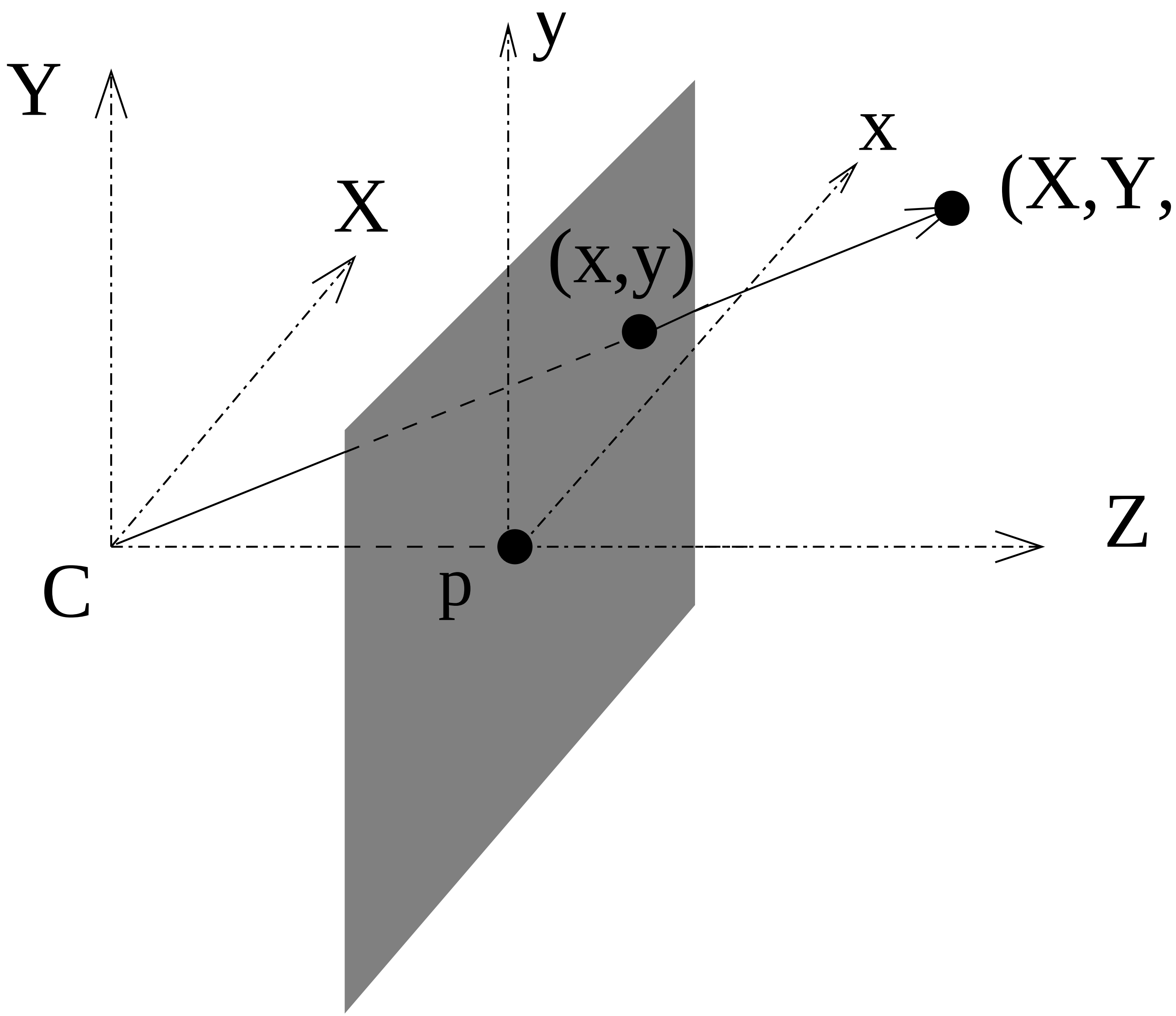

K8

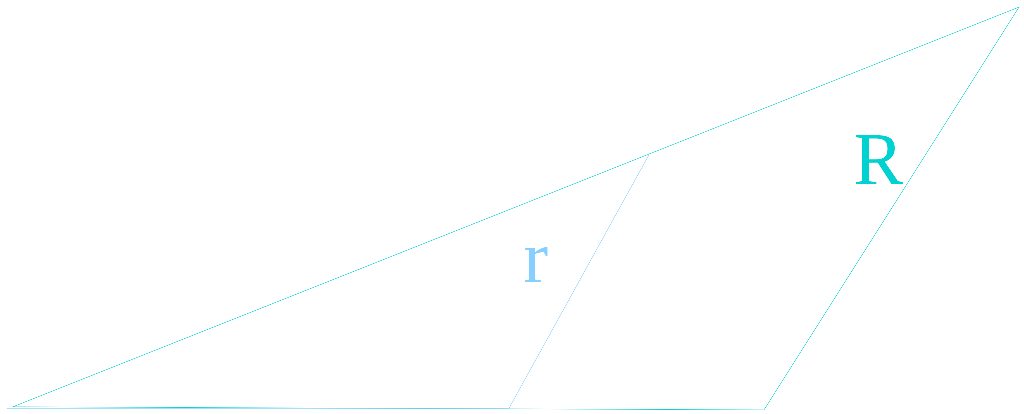

X
X
X
X
X
X
X

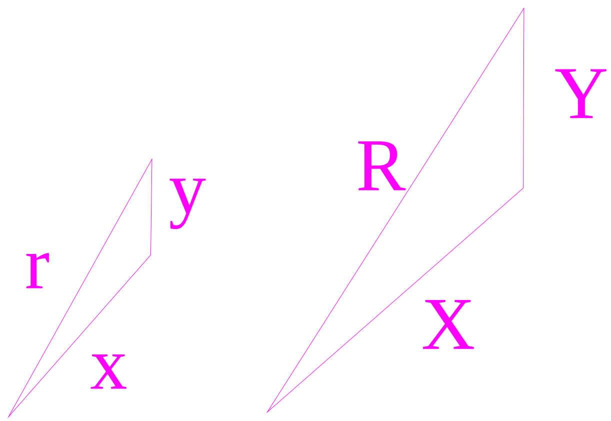


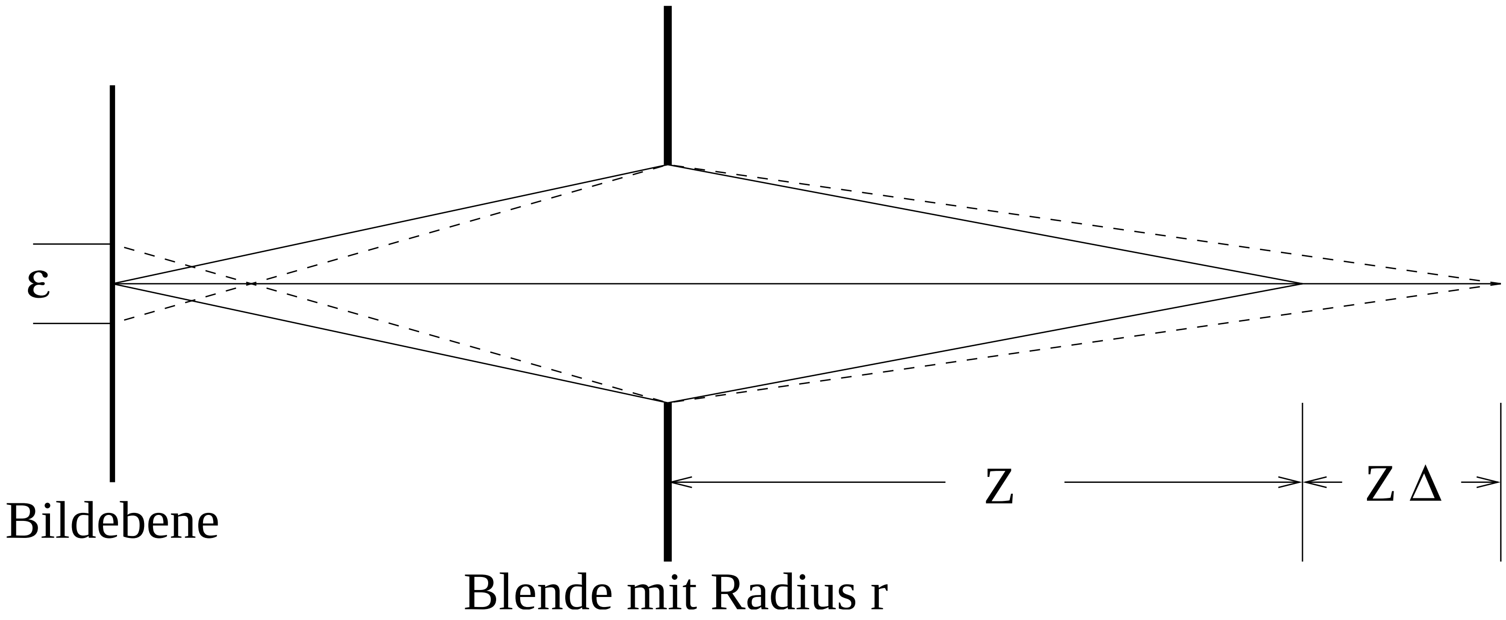

Bildkoordinatensystem (x,y)
Kamerakoordinaten−
system (X,Y,Z)
y
Y
x
X
Abbildungsstrahl
Hauptachse
Hauptpunkt
(X,Y,Z)
Z
Bildebene
optisches
Zentrum
Bildweite f
(x,y)



y
Y
x
X
(X,Y,
(x,y)
Z
C
p


R
r


r
y
x
R
Y
X


ε
Bildebene
Z
Z Δ
Blende mit Radius r