Bundes-
Blindeninstitut
Wien

LeMa
Lehr- und Lernmaterialien

Tastbare Versionen ausgewählter Grafiken aus dem Schulbuch

Angewandte Mathematik HAK 5

Grafiken: Tomáš Baťha

LEMA - Lehr- und Lernmaterialien
Hergestellt von der Abteilung für Inklusion und Lehrmittel am Bundes-Blindeninstitut Wien,
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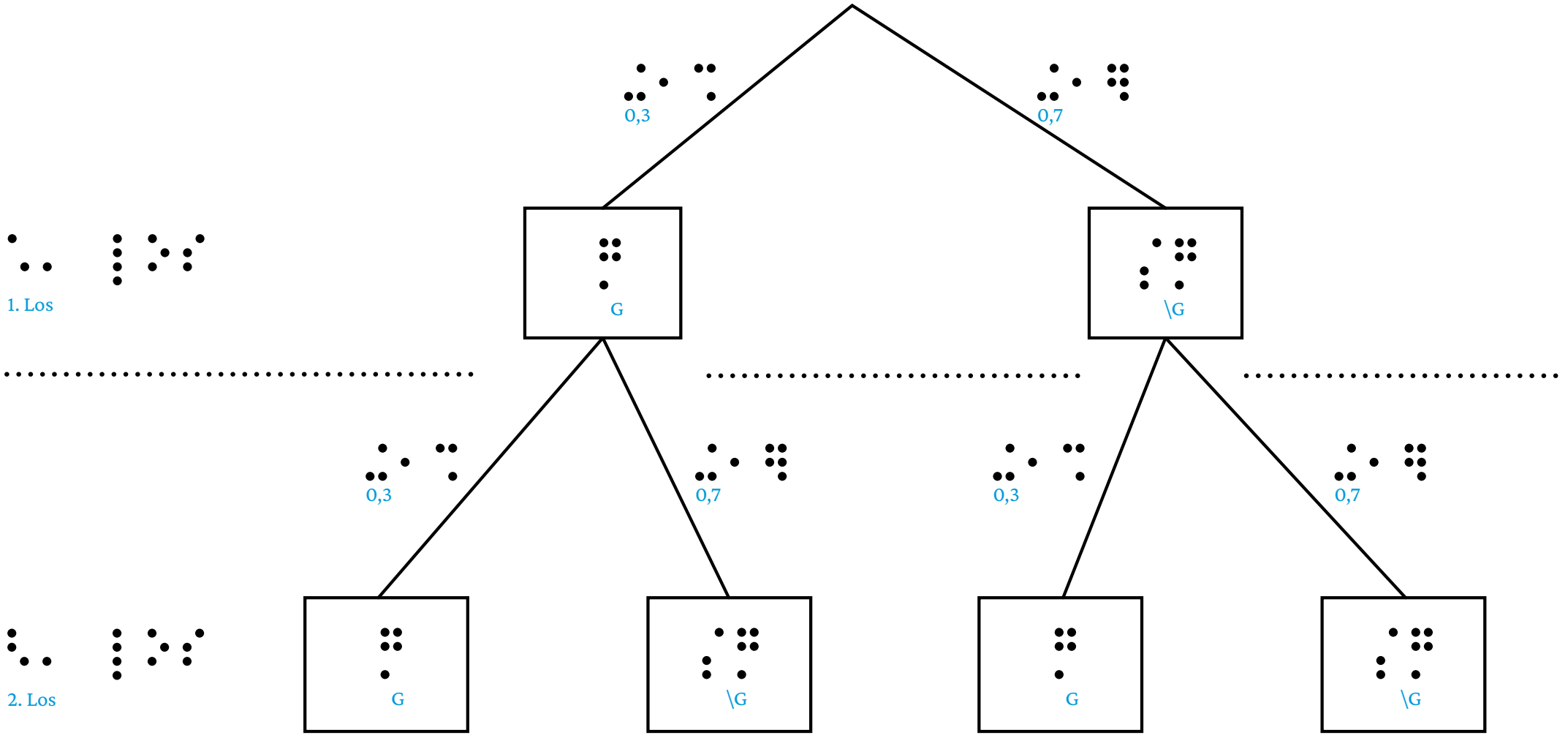
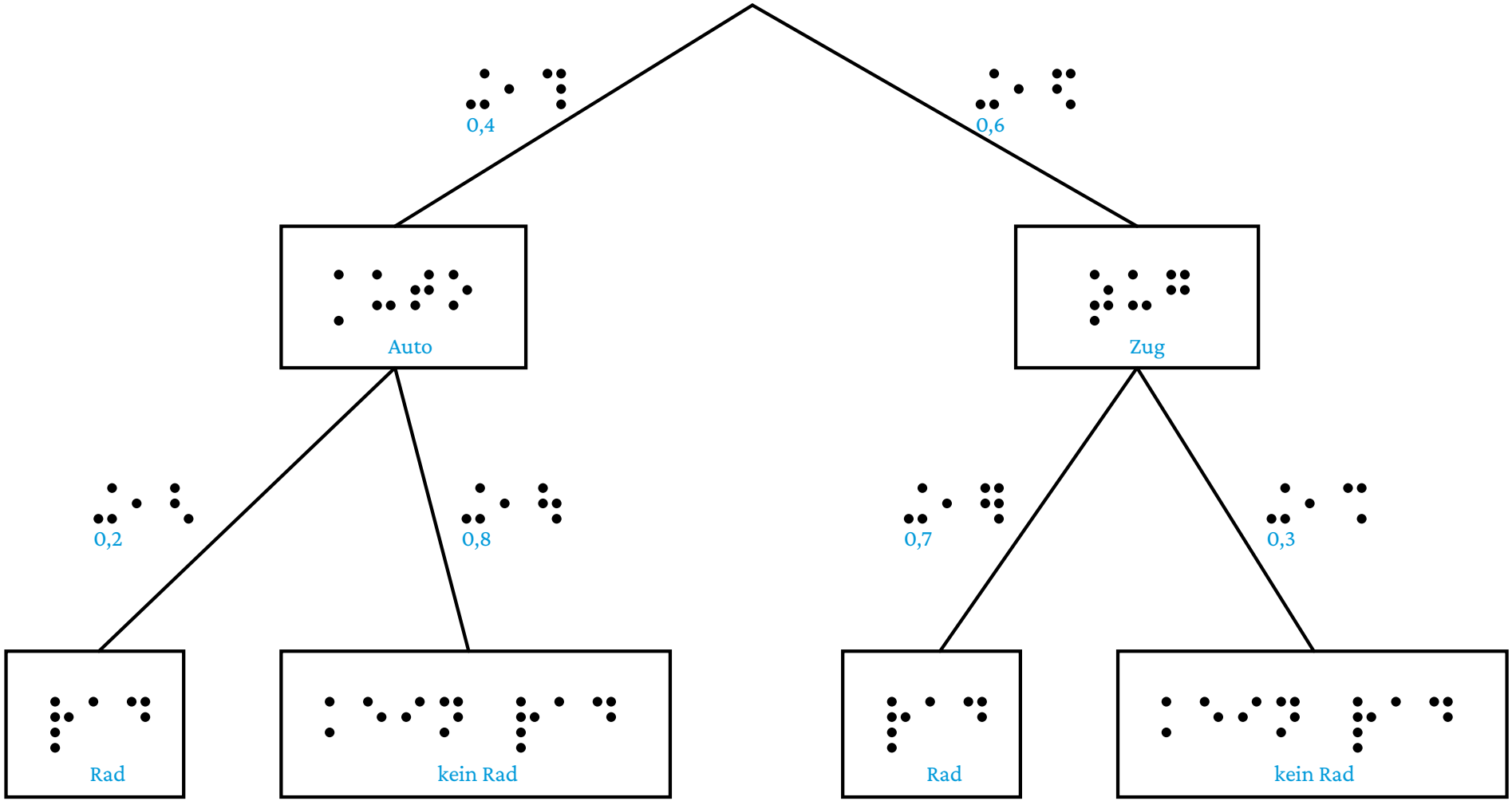
Angewandte Mathematik HAK Band 5

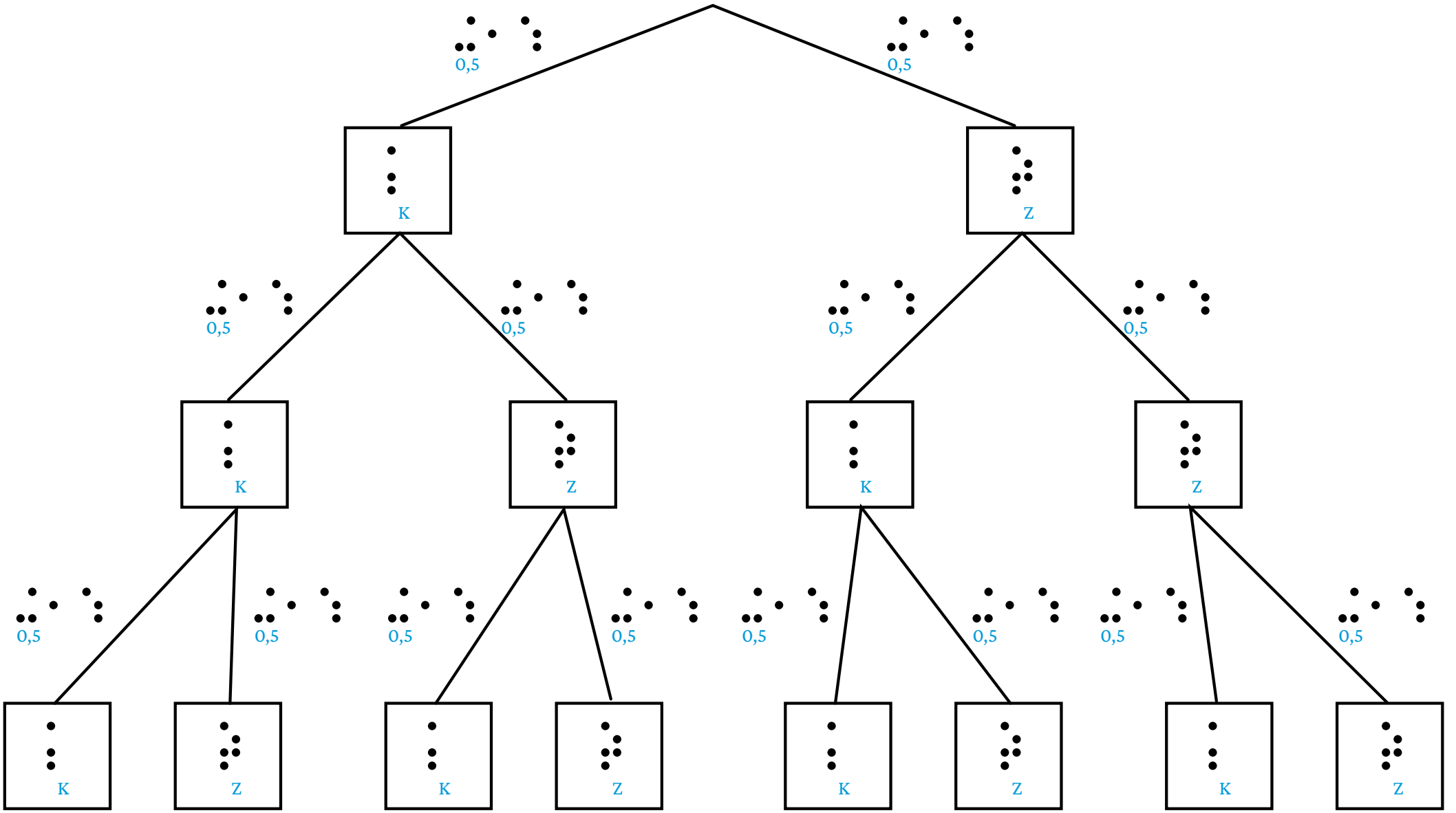
1.

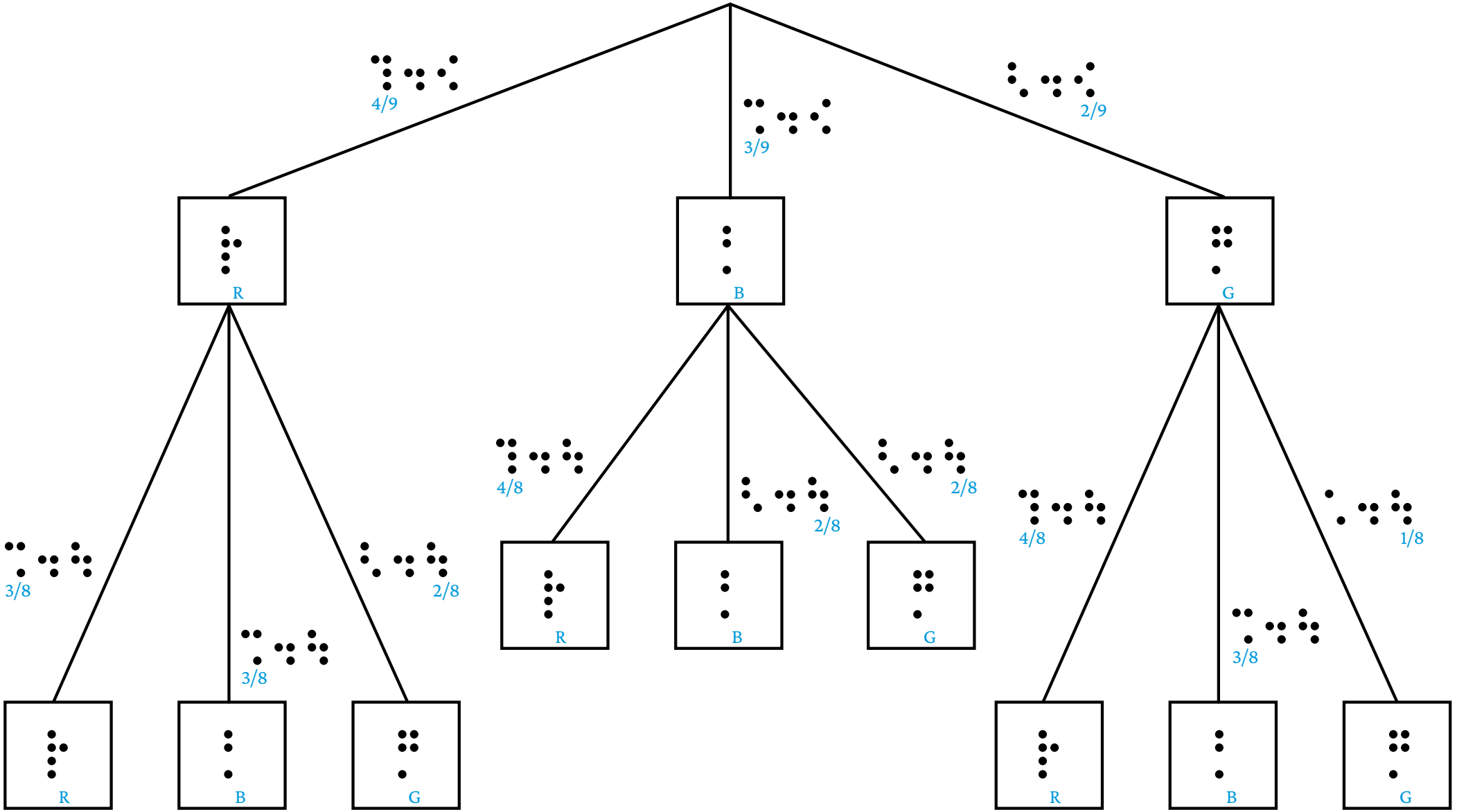
Wahrscheinlichkeitsrechnung

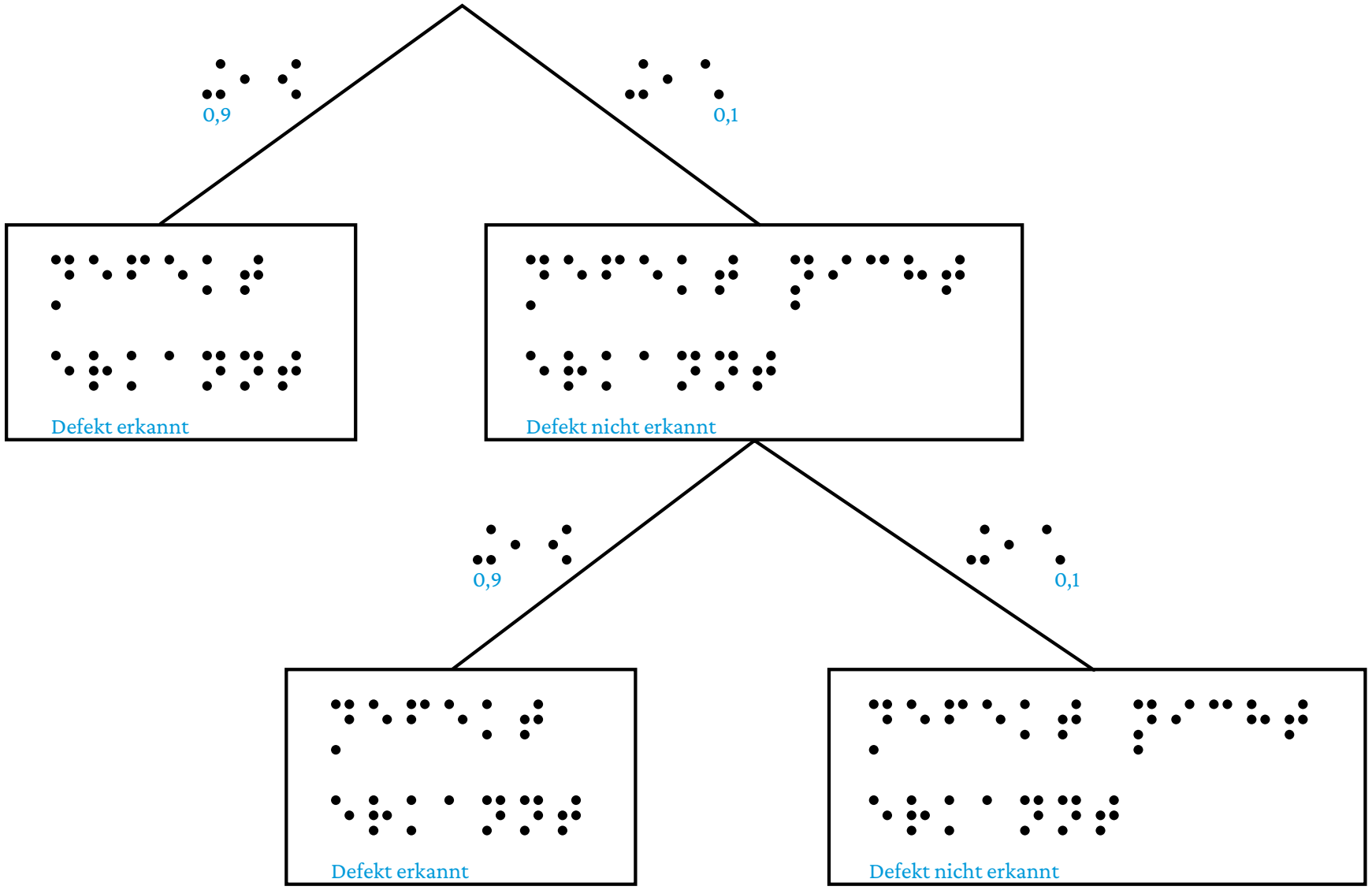


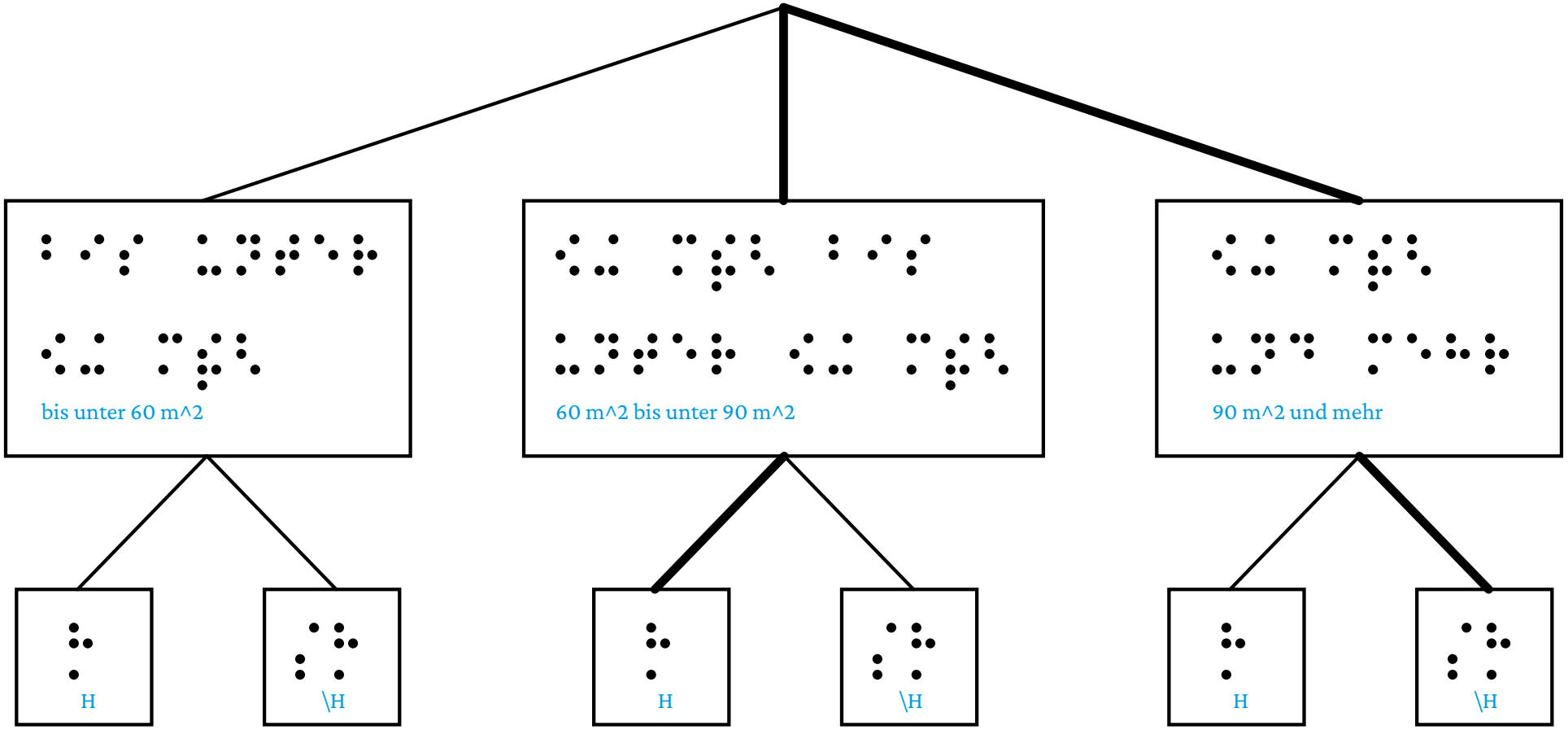
G ... Gewinnlos

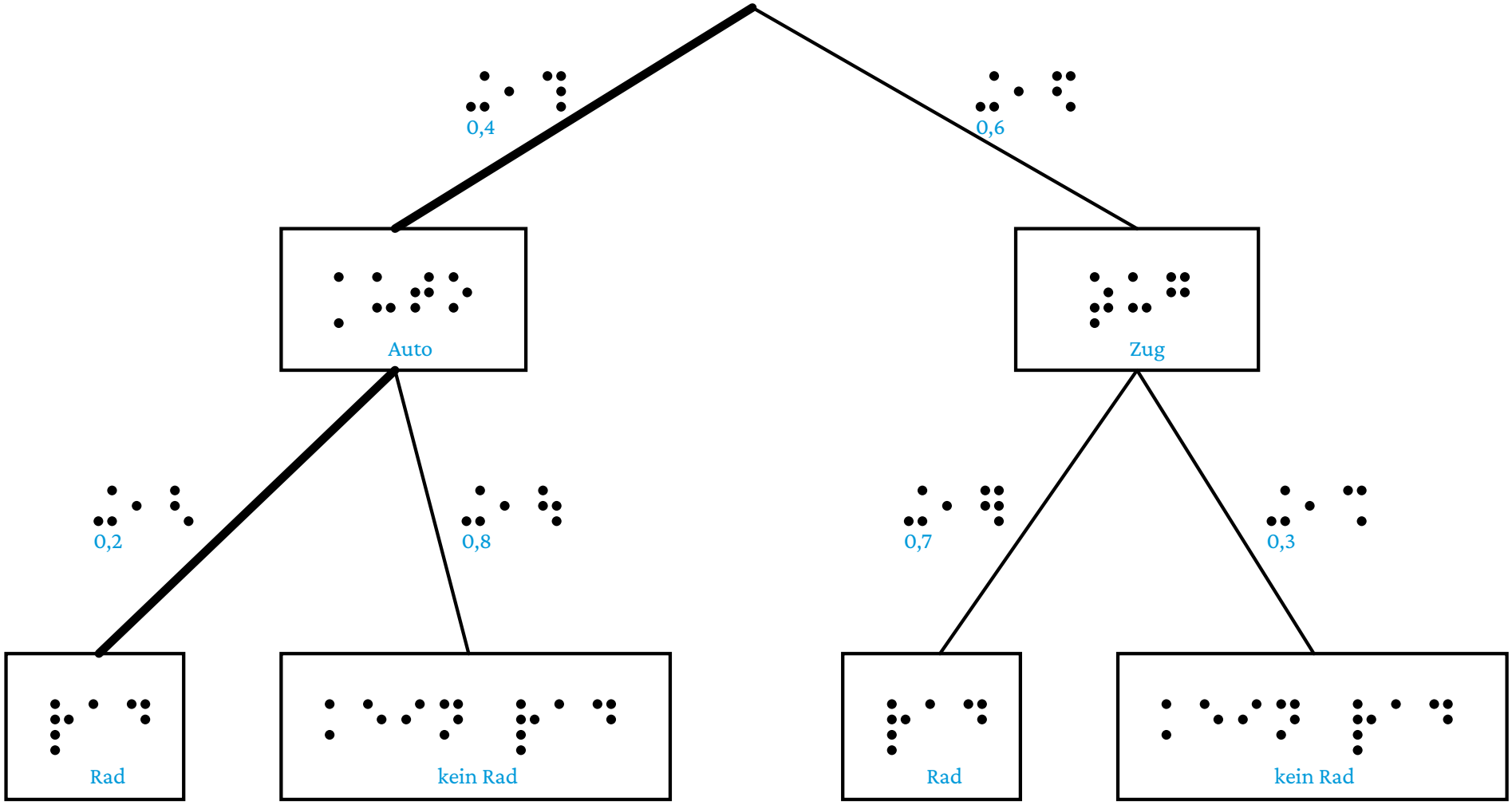

0,4
0,6
Auto
Zug
0,2
0,8
0,7
0,3
Rad
kein Rad
Rad
kein Rad

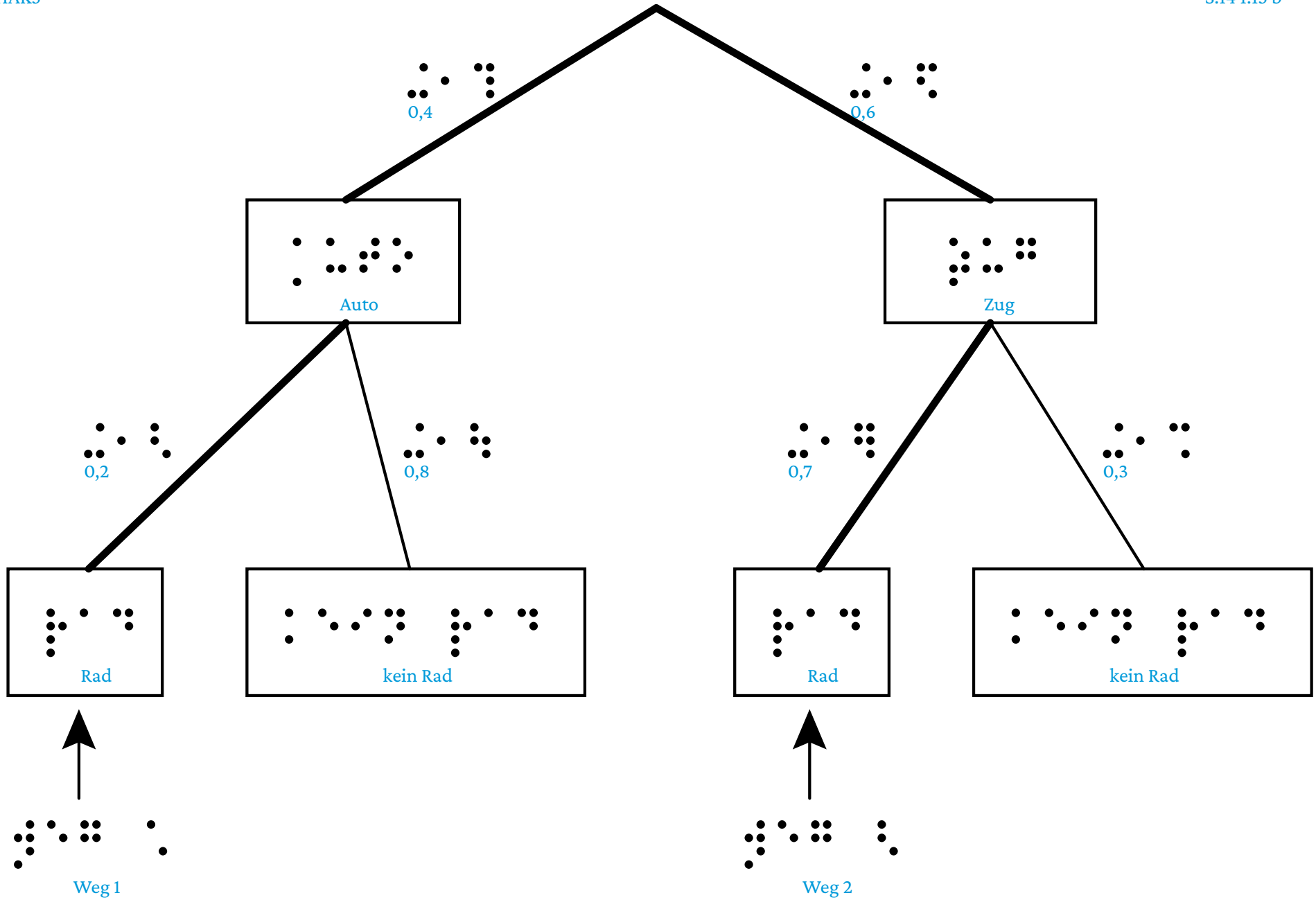

0,5
0,5
K
Z
0,5
0,5
0,5
0,5
K
Z
K
Z
0,5
0,5
0,5
0,5
0,5
0,5
0,5
0,5
K
Z
K
Z
K
Z
K
Z

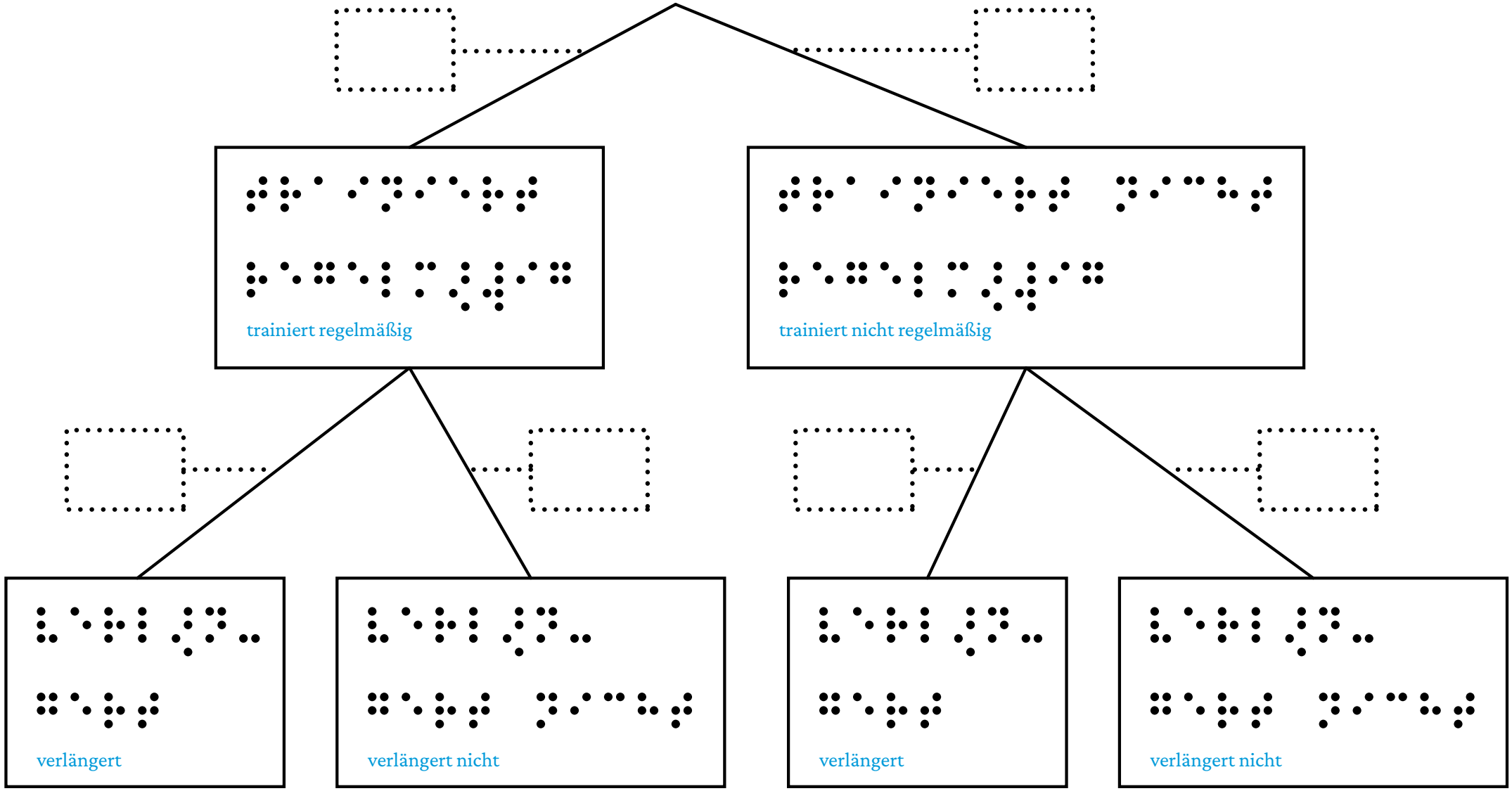

4/9
3/9
2/9
R
B
G
4/8
2/8
2/8
R
B
G
4/8
1/8
3/8
3/8
2/8
R
B
G
R
B
G


0,9
0,1
Defekt erkannt
Defekt nicht erkannt
0,9
0,1
Defekt erkannt
Defekt nicht erkannt

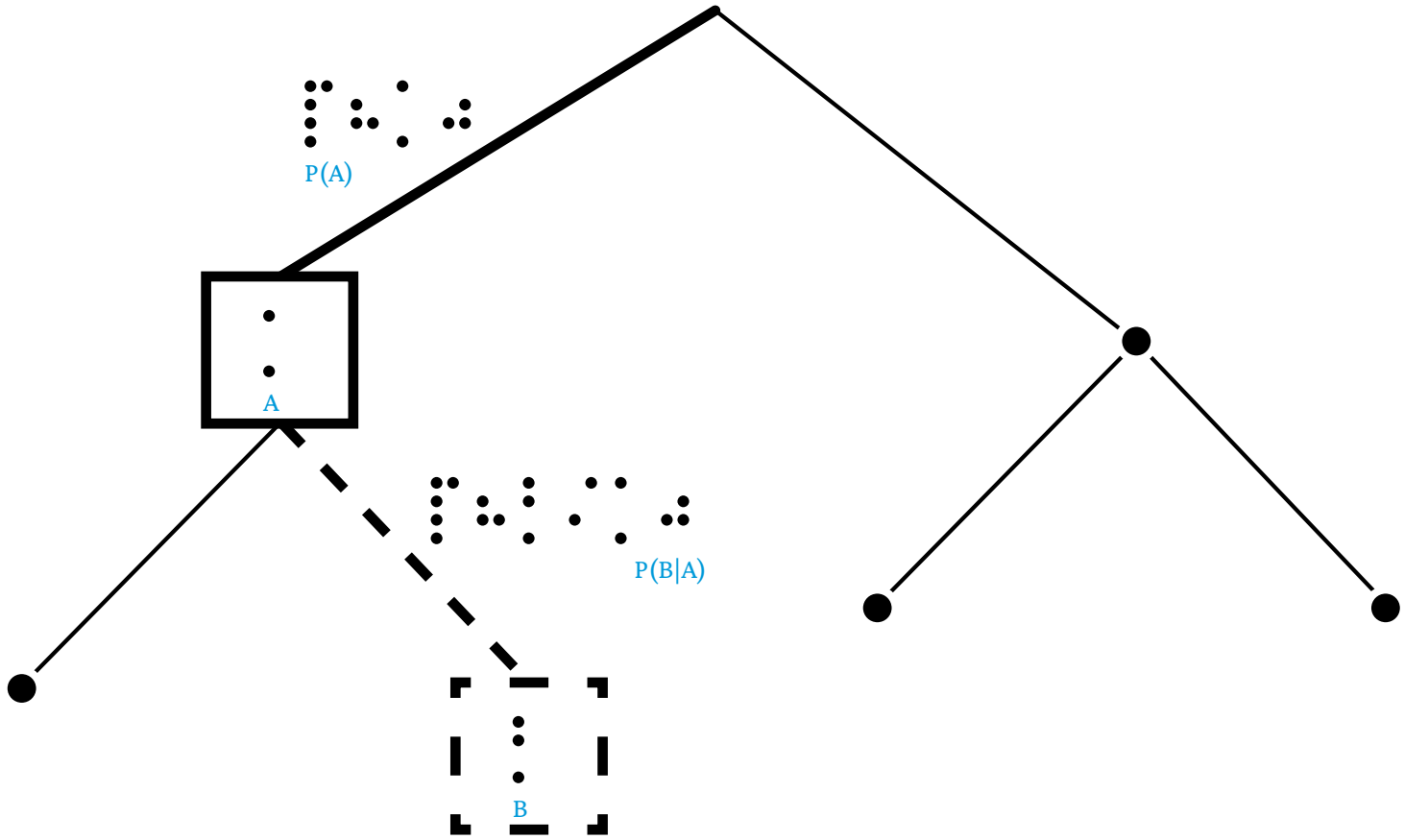

bis unter 60 m^2
60 m^2 bis unter 90 m^2
90 m^2 und mehr
H
\H
H
\H
H
\H


0,4
0,6
Auto
Zug
0,2
0,8
0,7
0,3
Rad
kein Rad
Rad
kein Rad

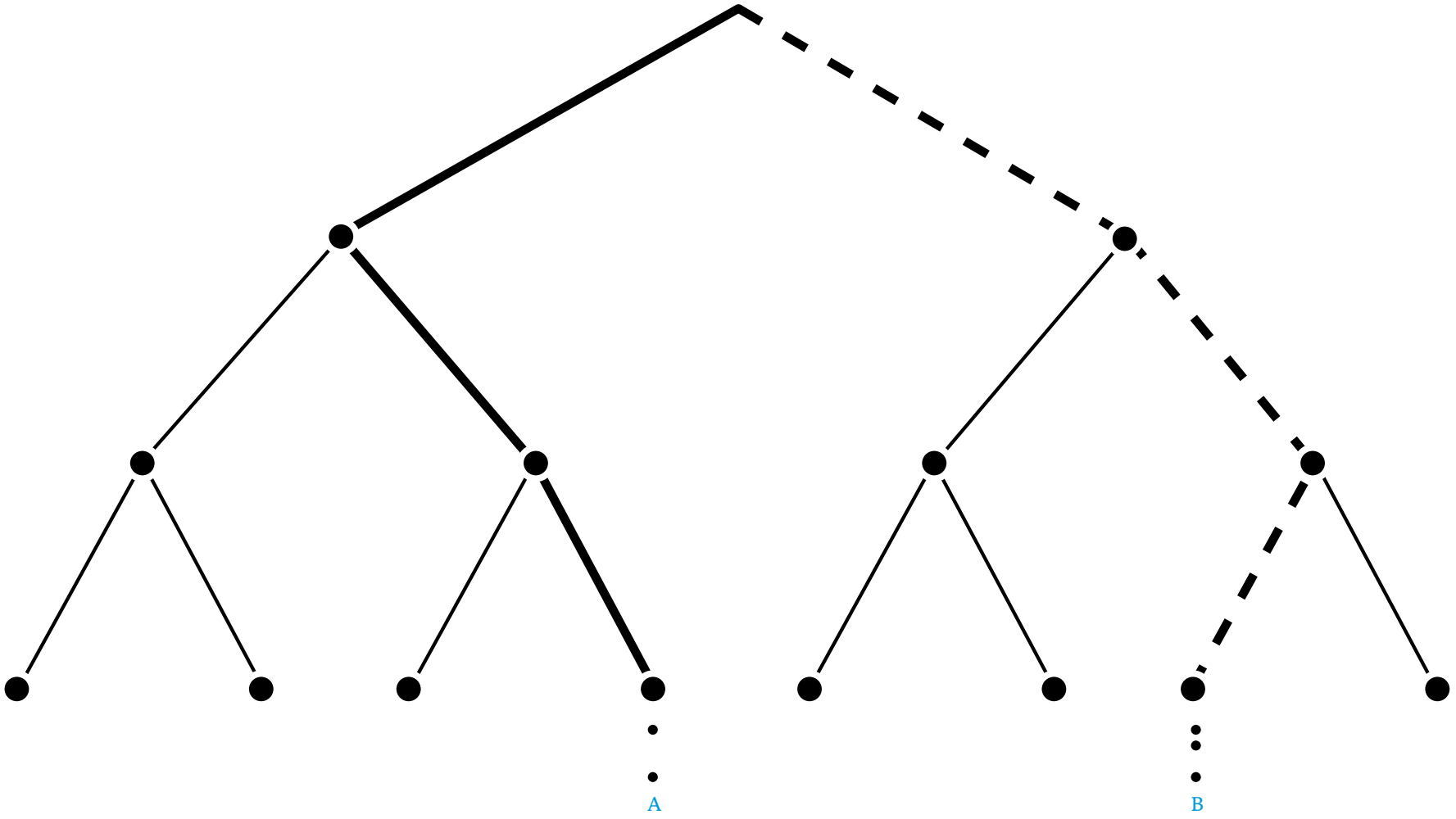

0,4
0,6
Auto
Zug
0,2
0,8
0,7
0,3
Rad
kein Rad
Rad
kein Rad
Weg 1
Weg 2

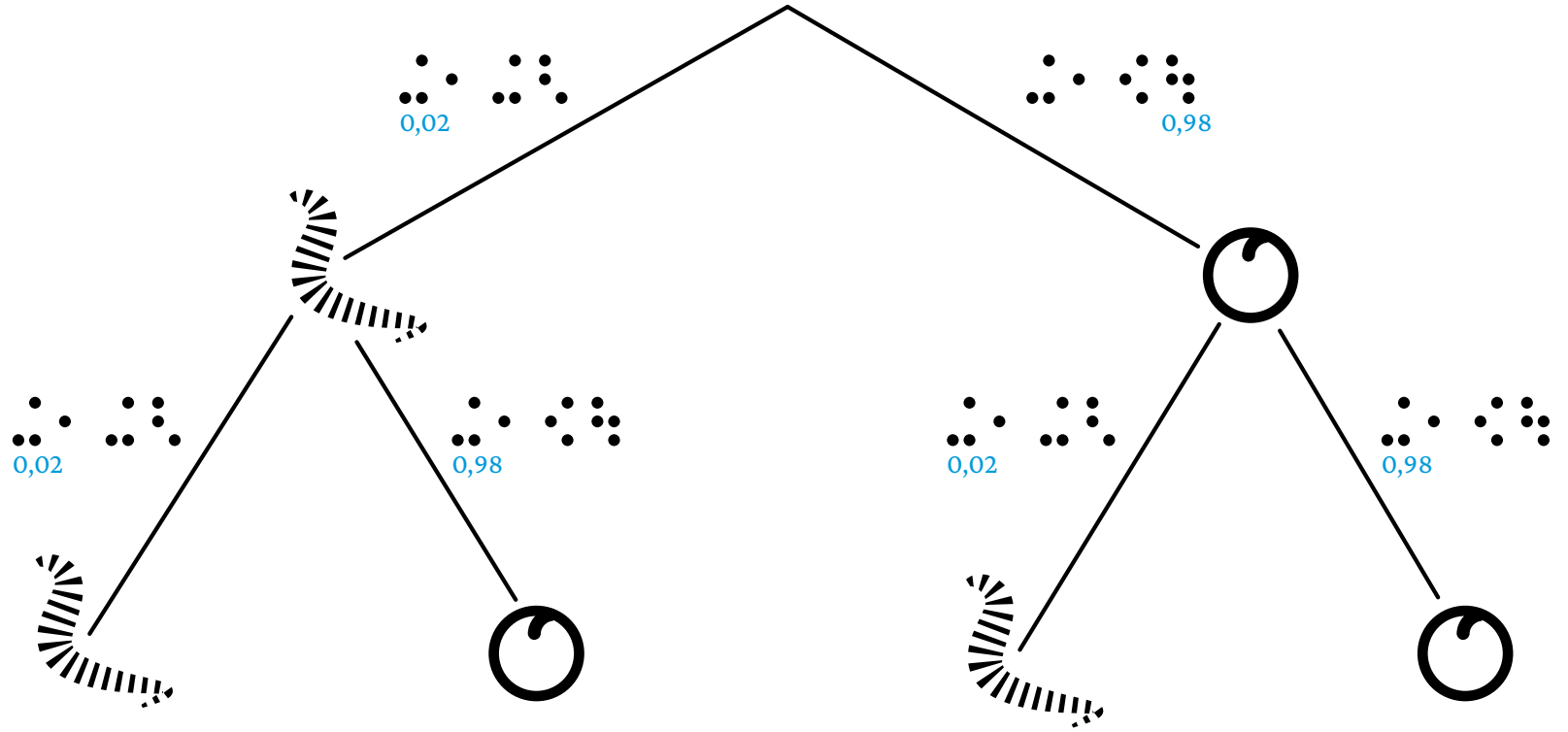

trainiert regelmäßig
trainiert nicht regelmäßig
verlängert
verlängert nicht
verlängert
verlängert nicht

Veranschaulichung



Veranschaulichung



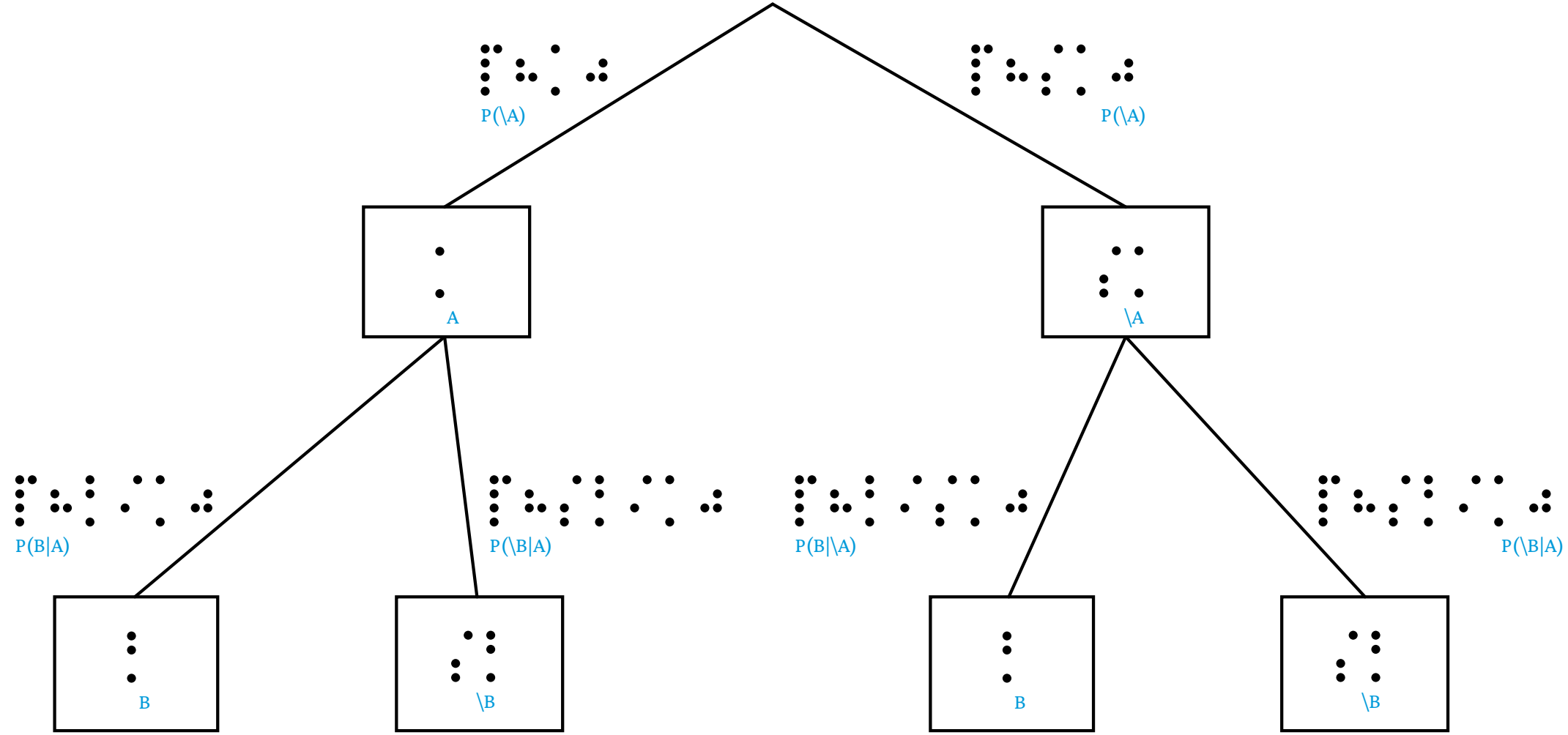


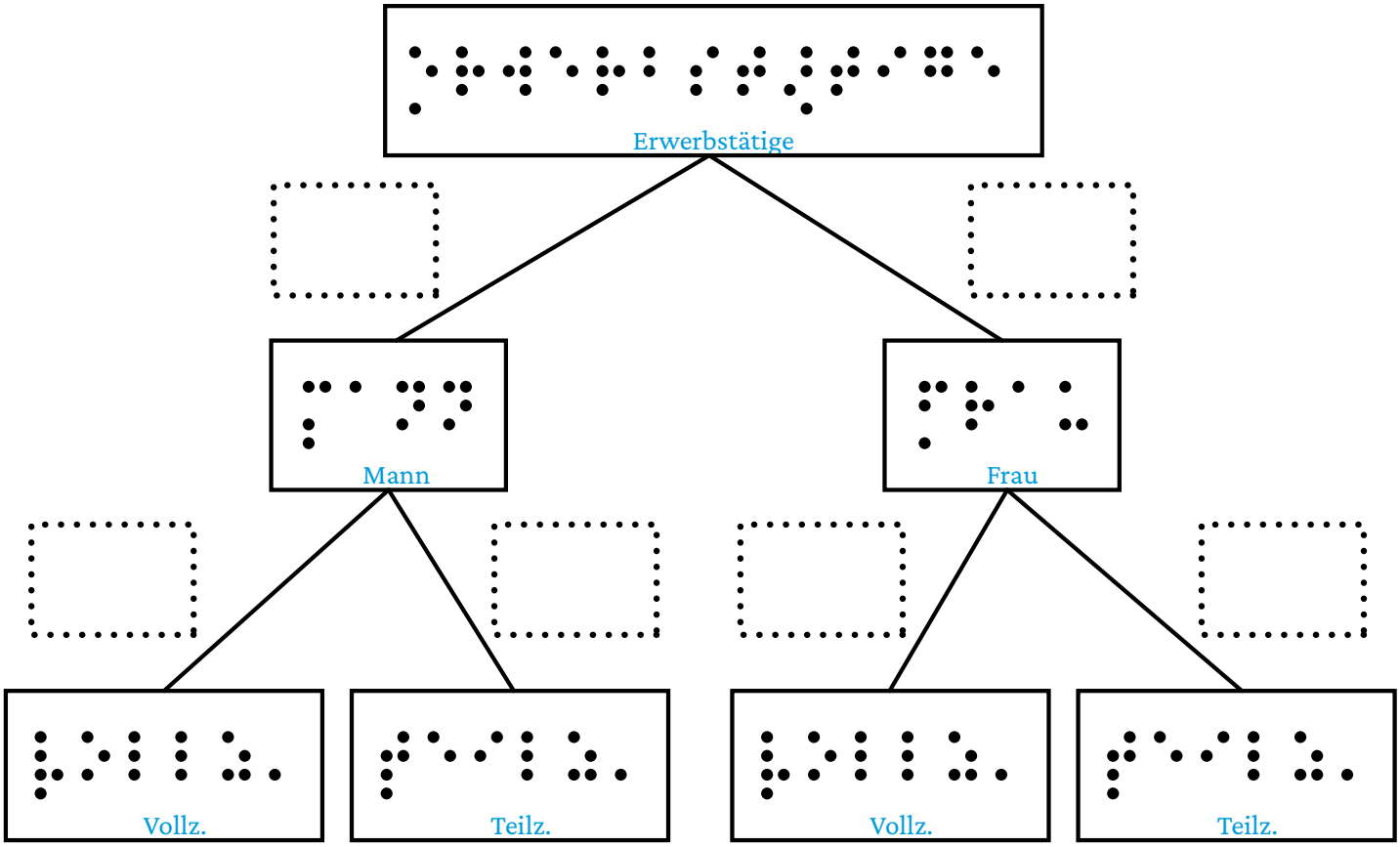
2 befallen

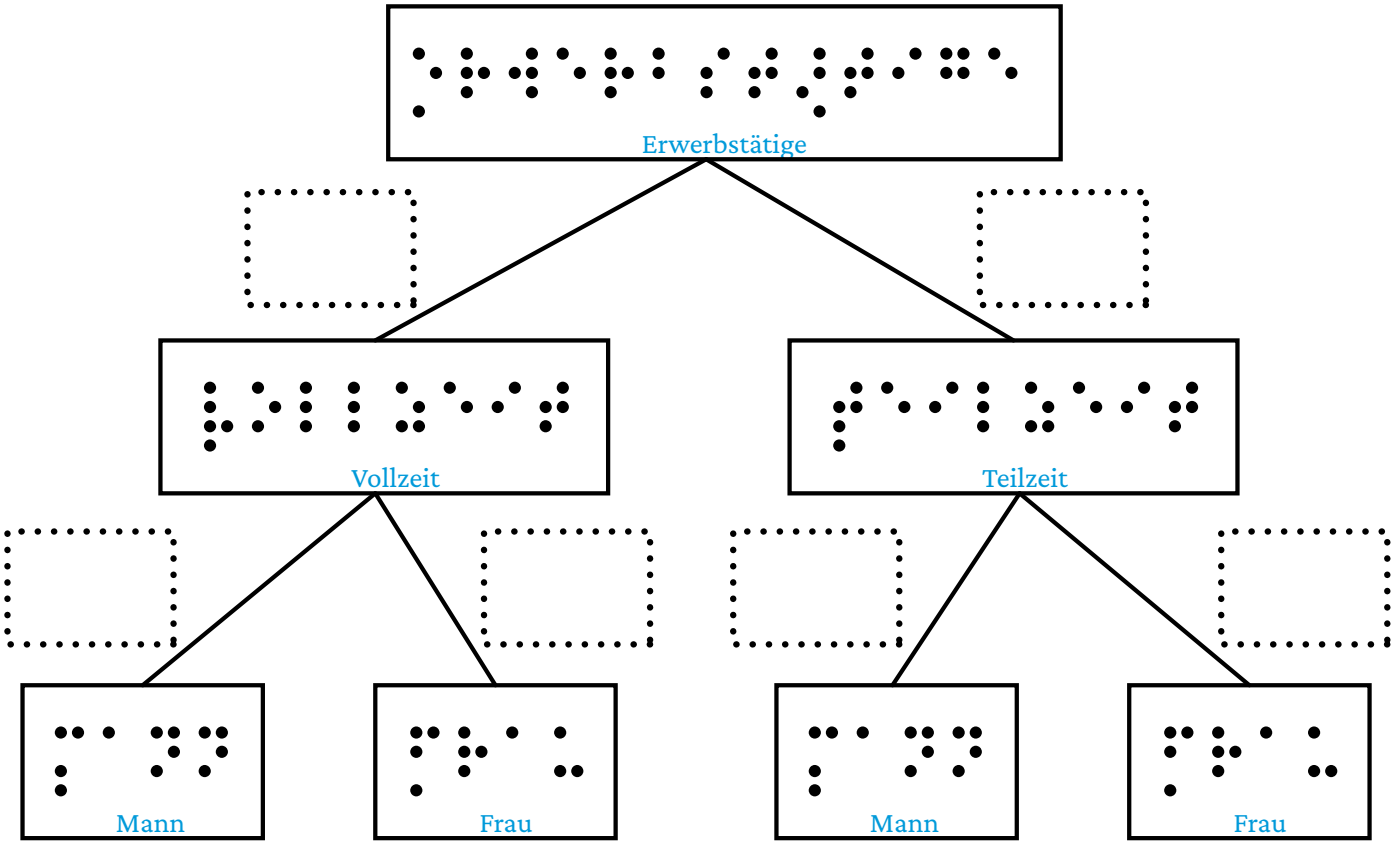
1 befallen

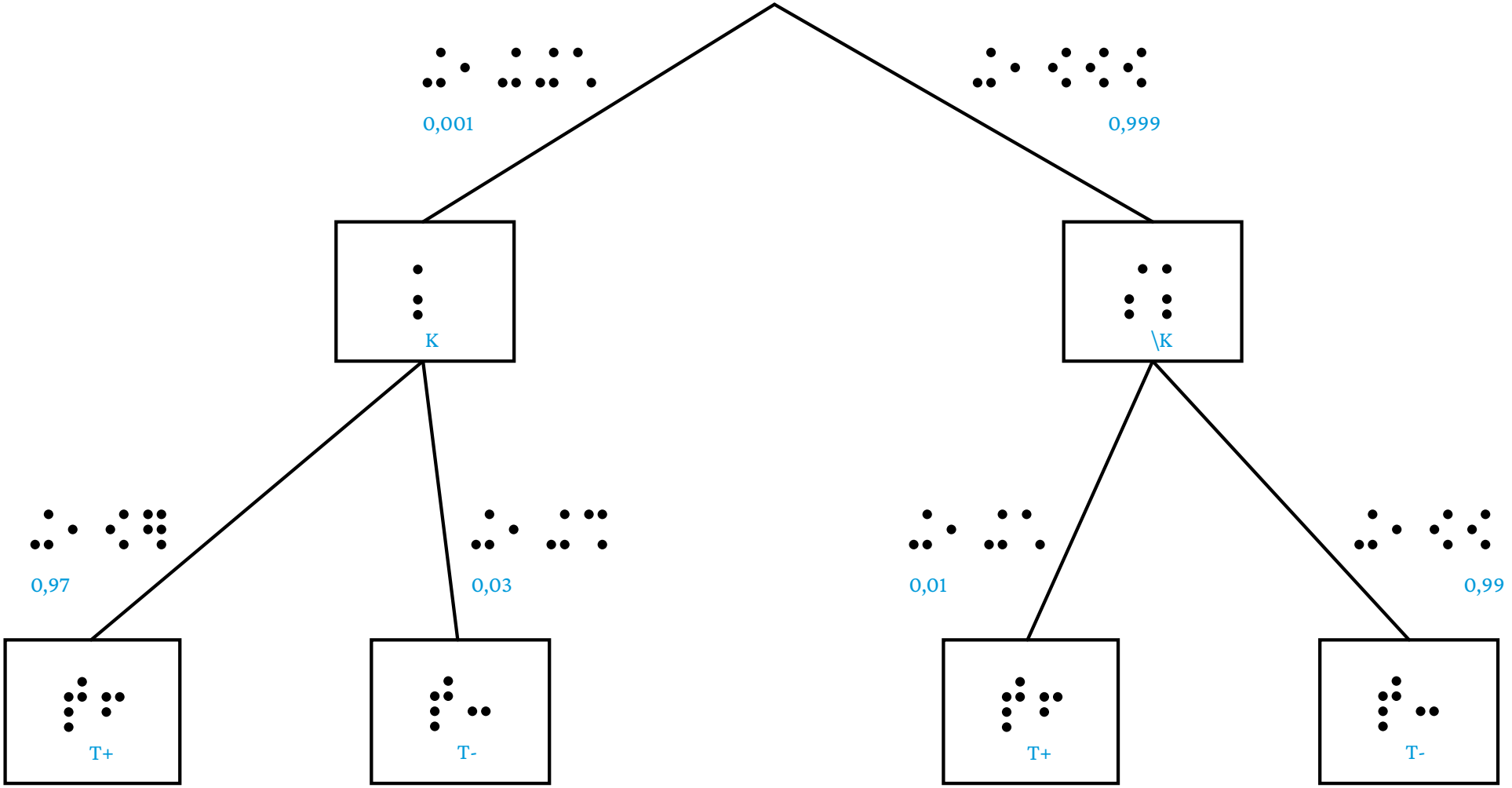
1 befallen

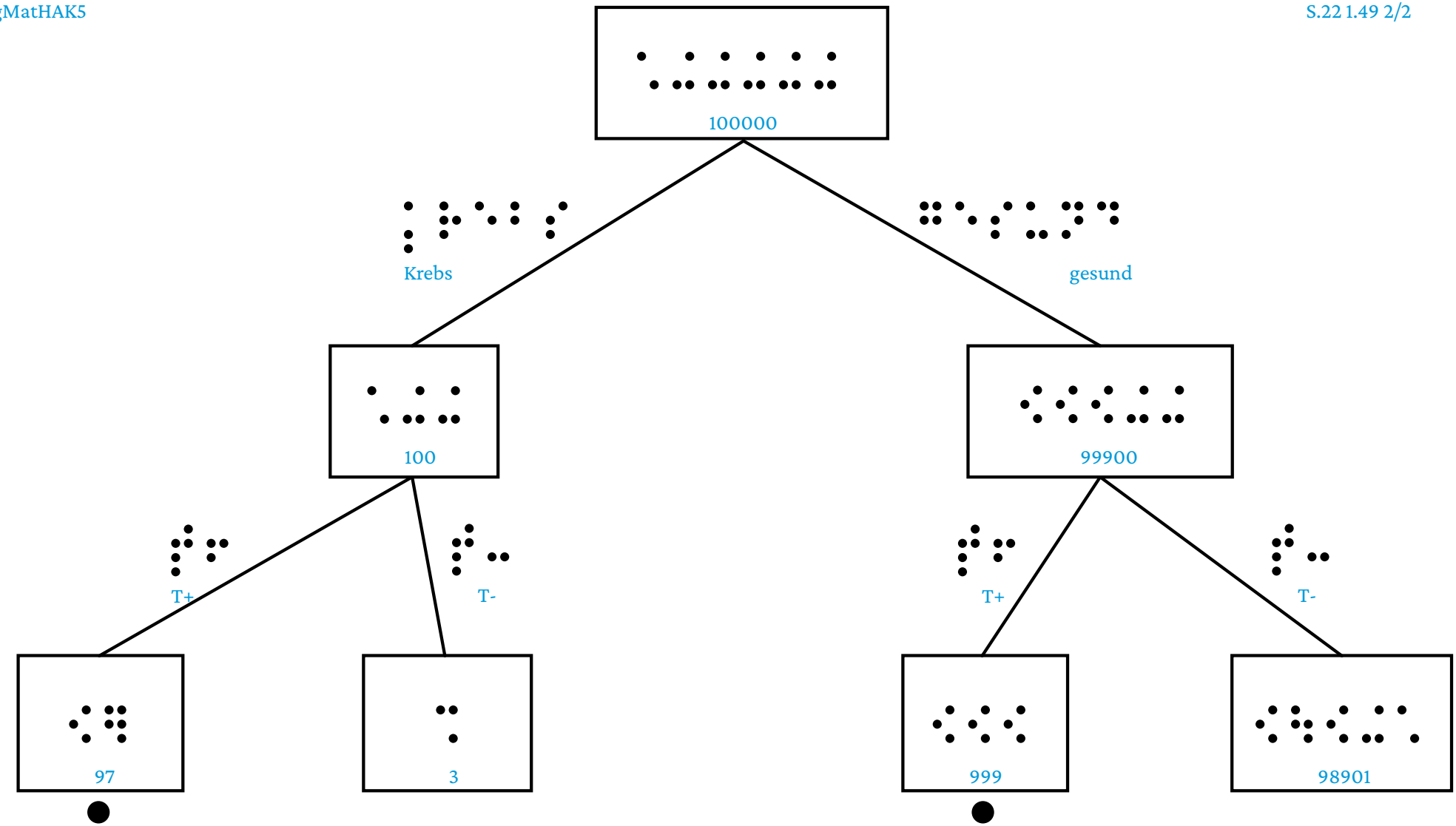
0 befallen


P(\A)
P(\A)
A
\A
P(B|A)
P(\B|A)
P(B|\A)
P(\B|A)
B
\B
B
\B

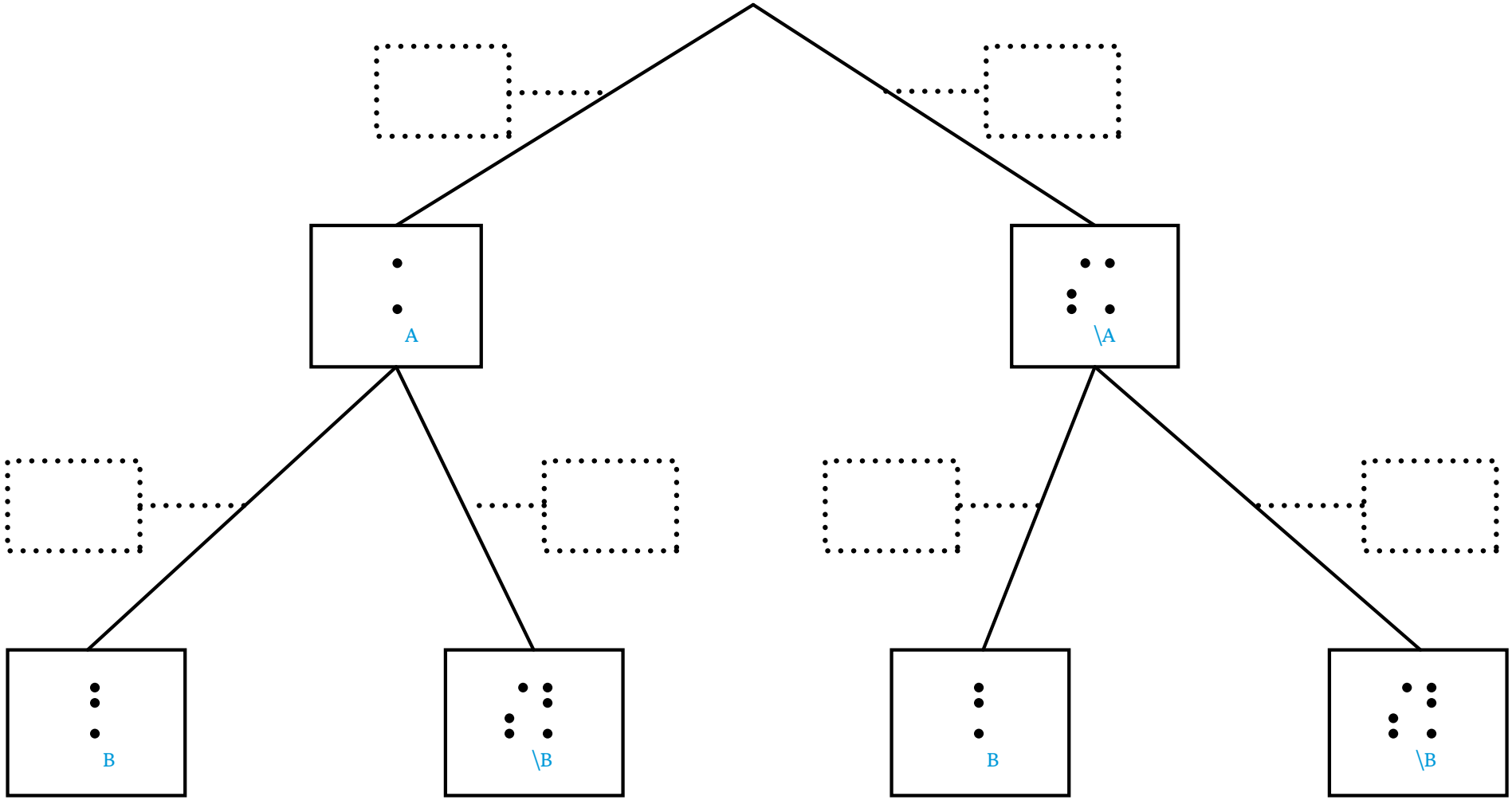

Erwerbstätige
Mann
Frau
Vollz.
Teilz.
Vollz.
Teilz.

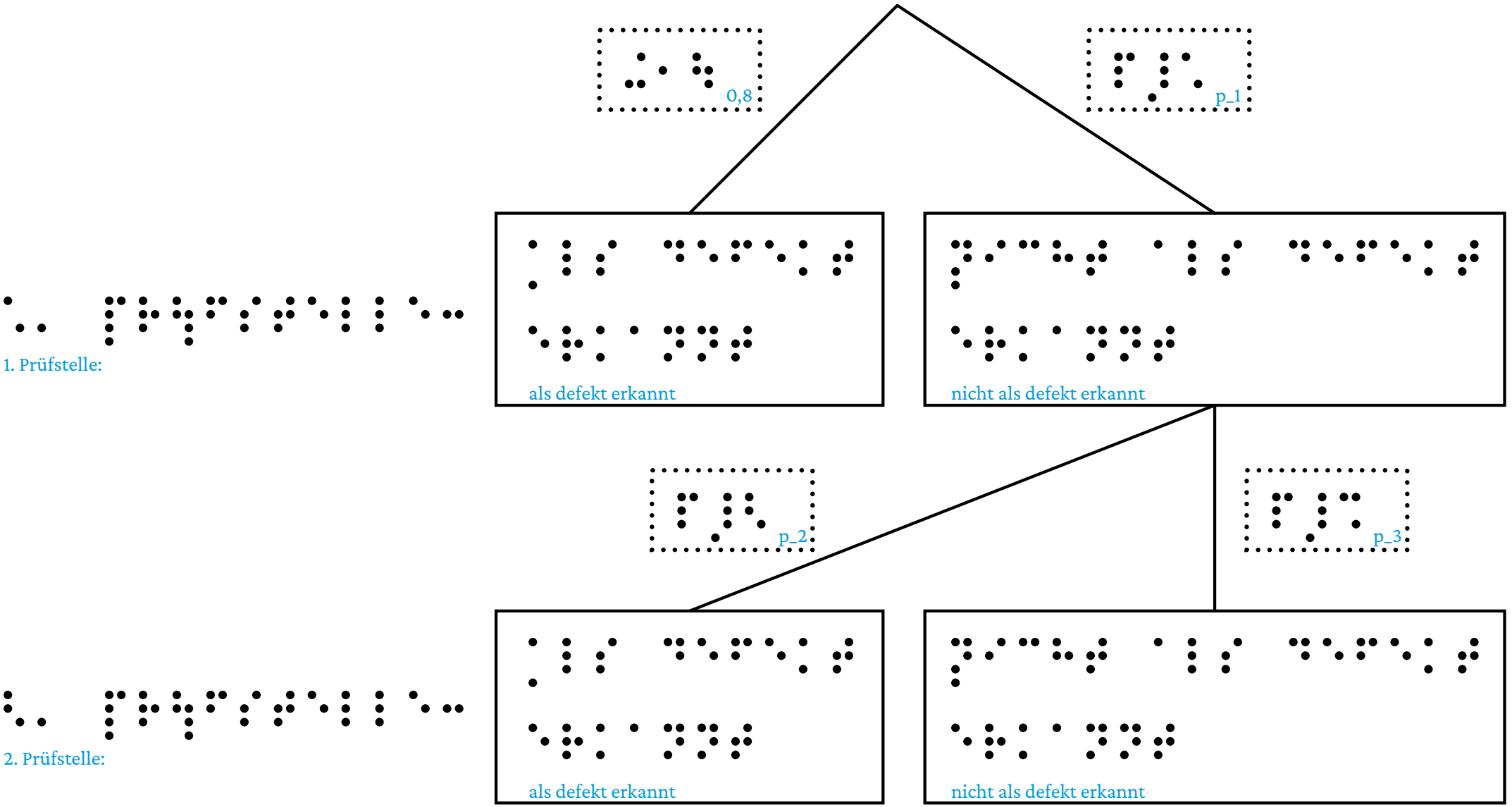

Erwerbstätige
Vollzeit
Teilzeit
Mann
Frau
Mann
Frau


0,001
0,999
K
\K
0,97
0,03
0,01
0,99
T+
T-
T+
T-



=insgesamt 1096 positive Testergebnisse

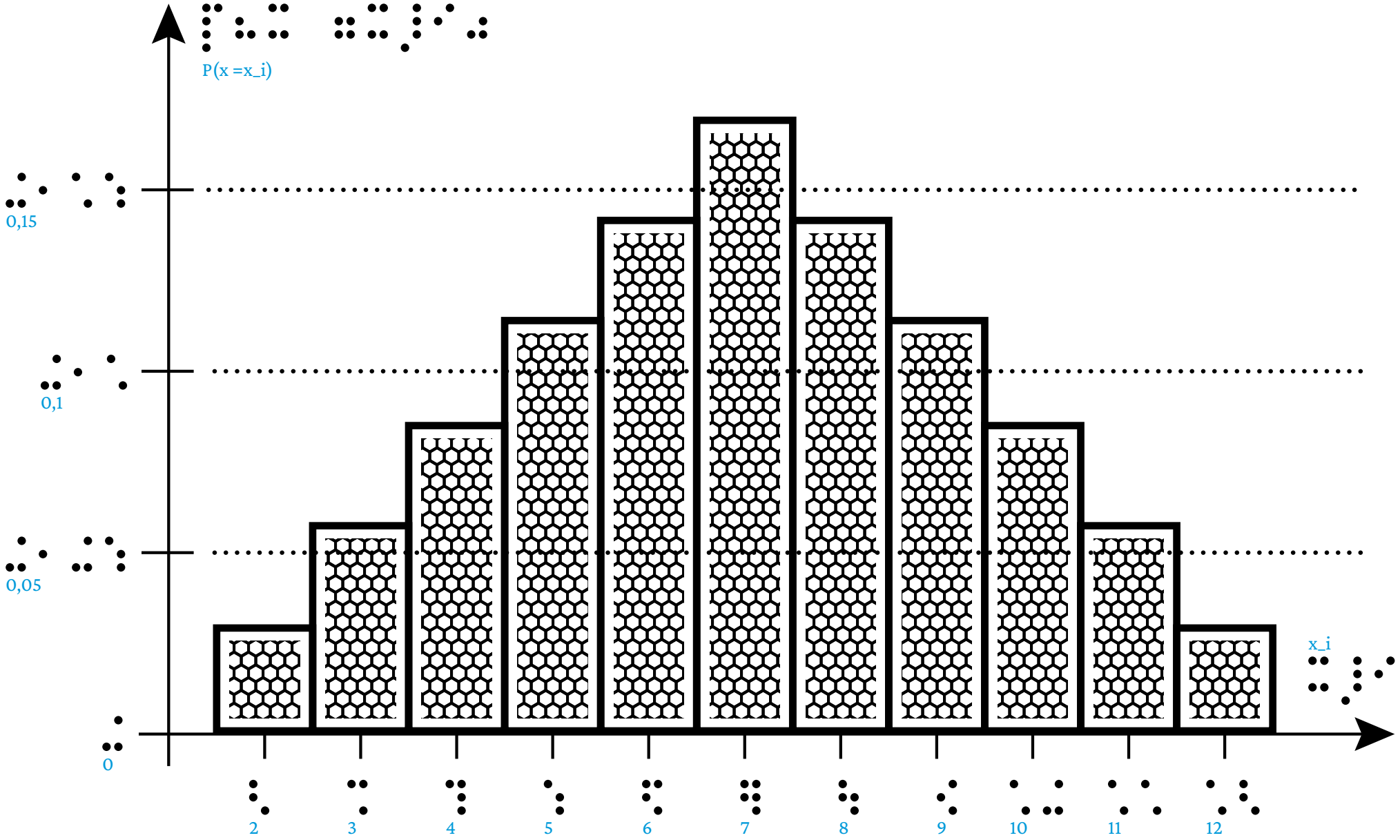

A
\A
B
\B
B
\B

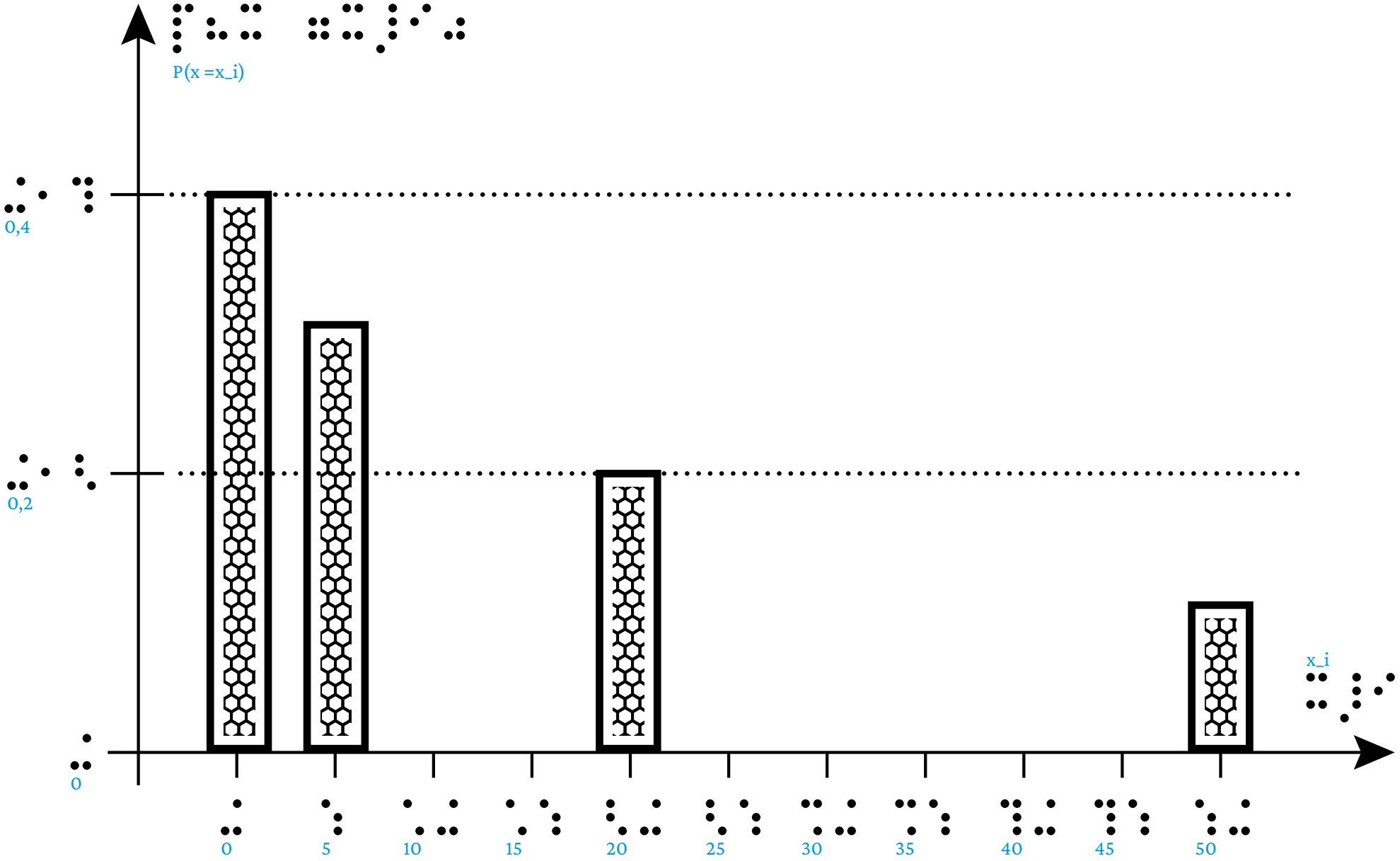

0,8
p_1
1. Prüfstelle:
als defekt erkannt
nicht als defekt erkannt
p_2
p_3
2. Prüfstelle:
als defekt erkannt
nicht als defekt erkannt

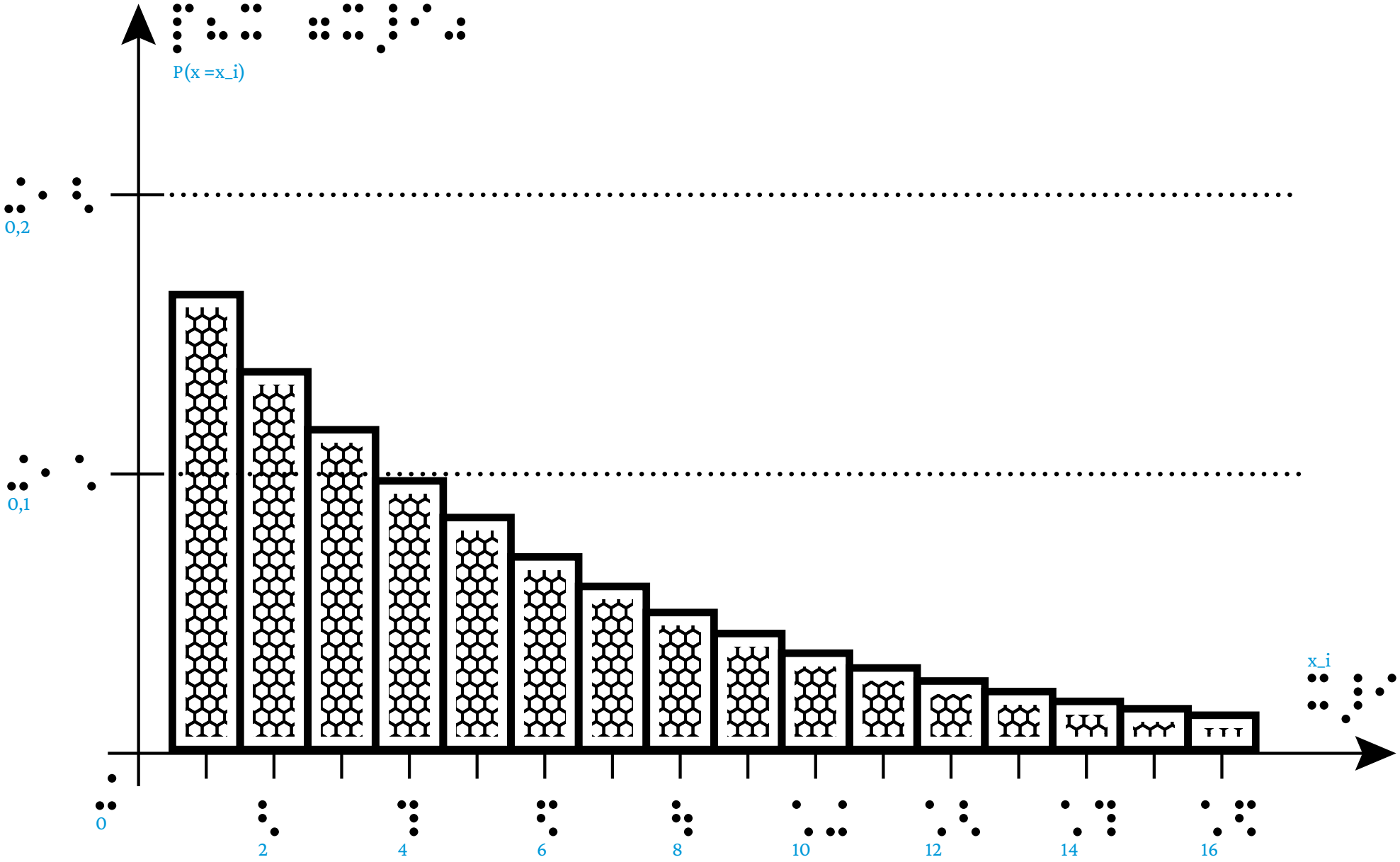
Angewandte Mathematik HAK Band 5

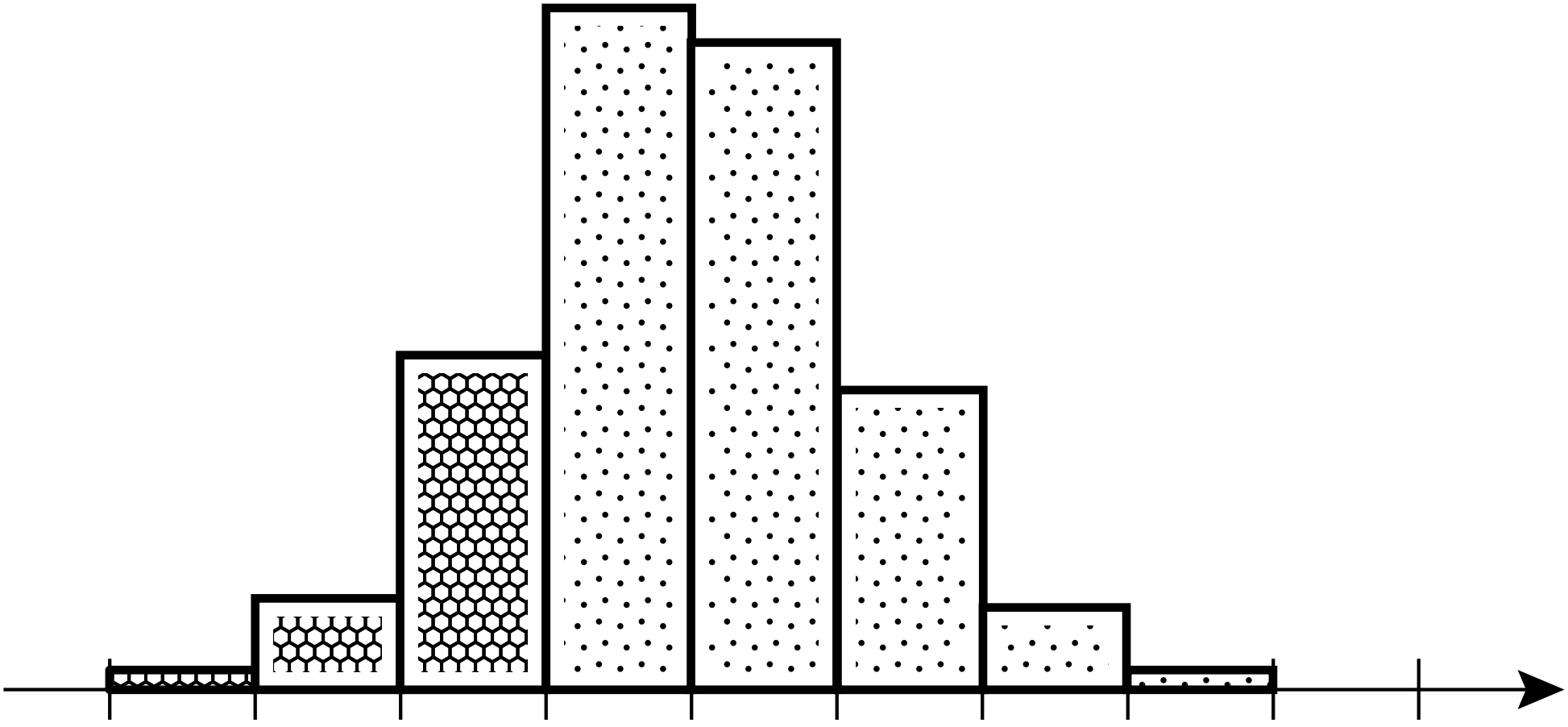
2.

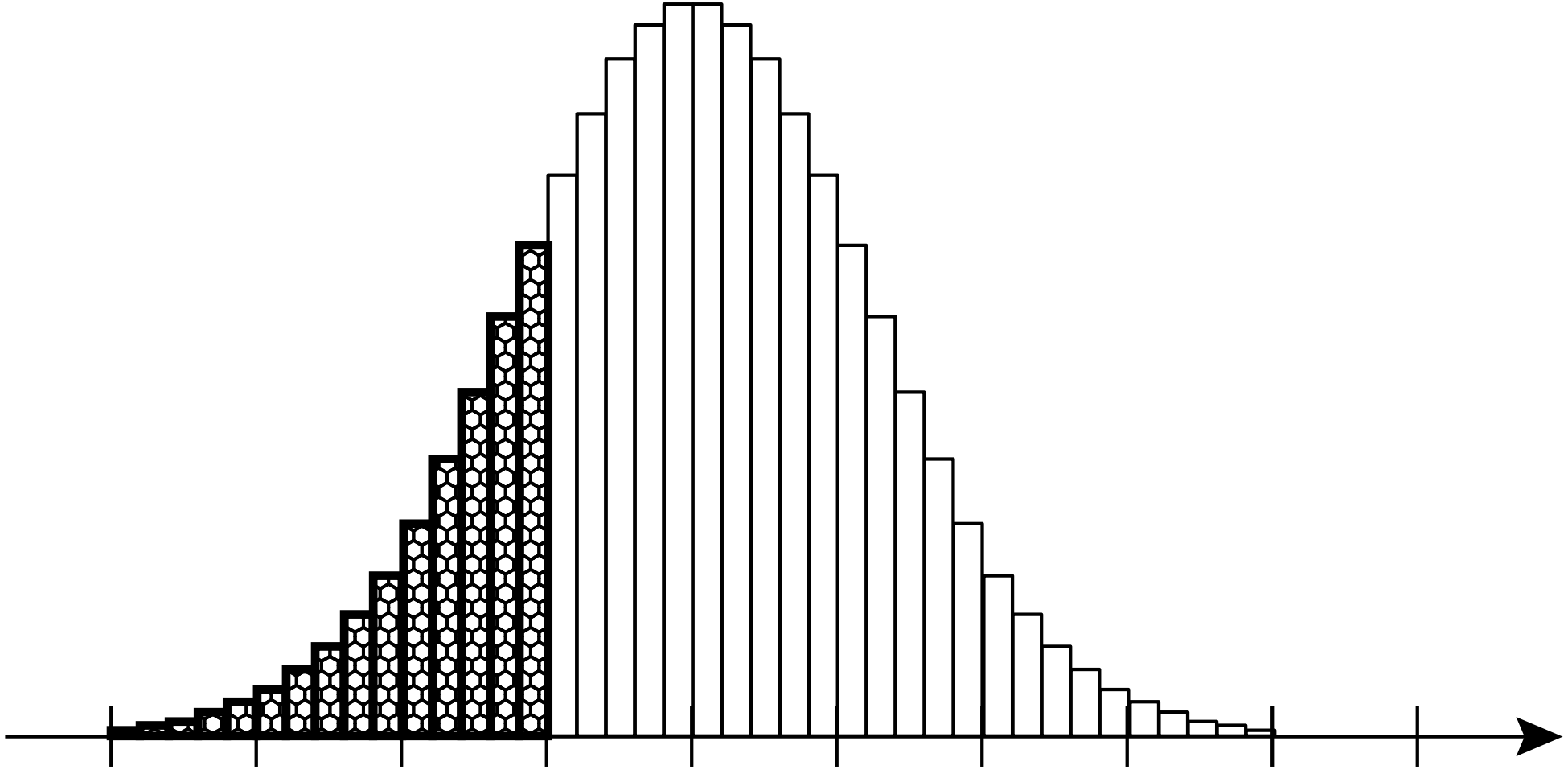
Wahrscheinlichkeitsverteilungen


P(x =x_i)
0,15
0,1
0,05
0
x_i
2
3
4
5
6
7
8
9
10
11
12

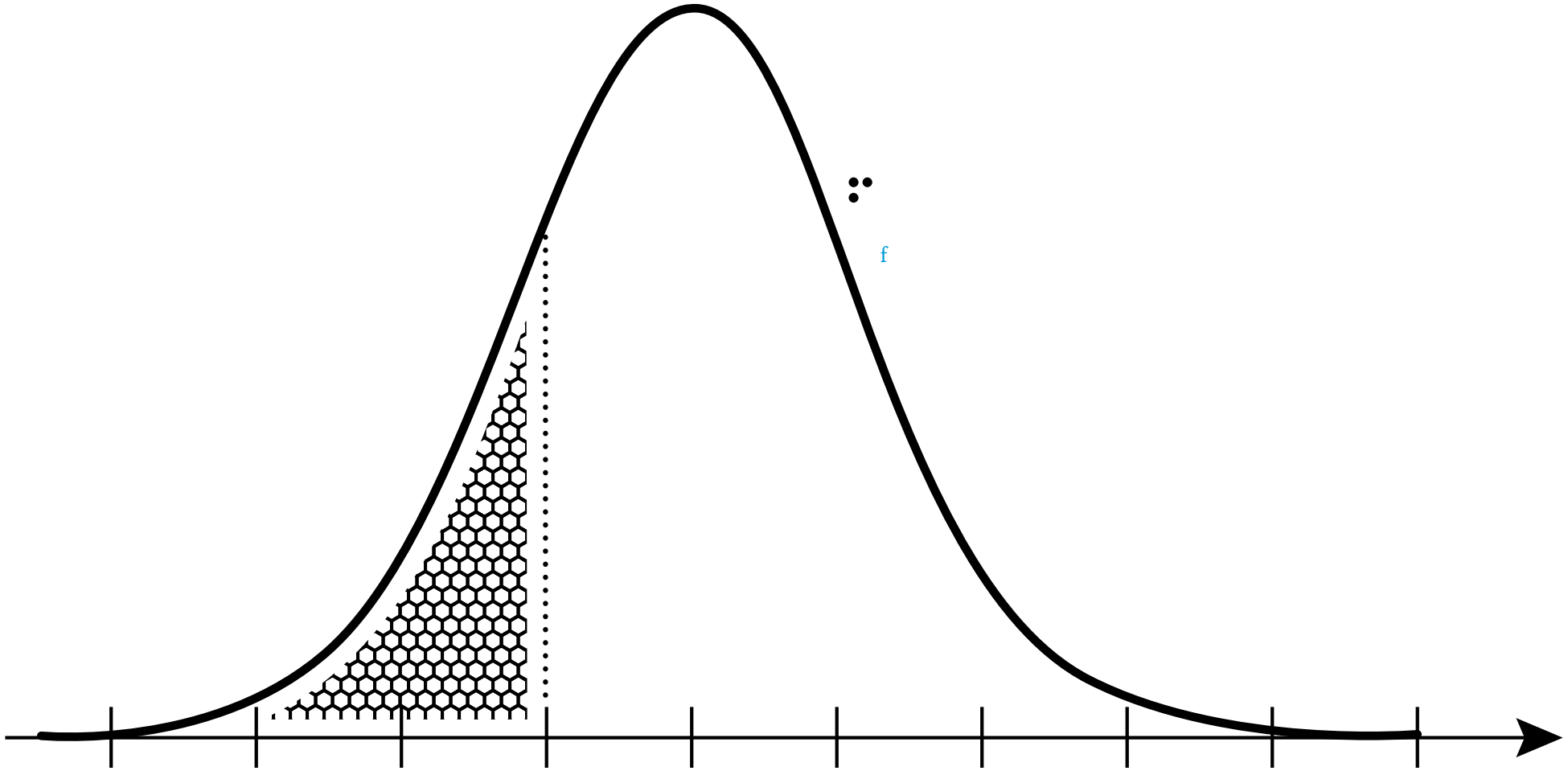

P(x =x_i)
0,4
0,2
0
x_i
0
5
10
15
20
25
30
35
40
45
50


P(x =x_i)
0,2
0,1
0
2
4
6
8
10
12
14
16
x_i

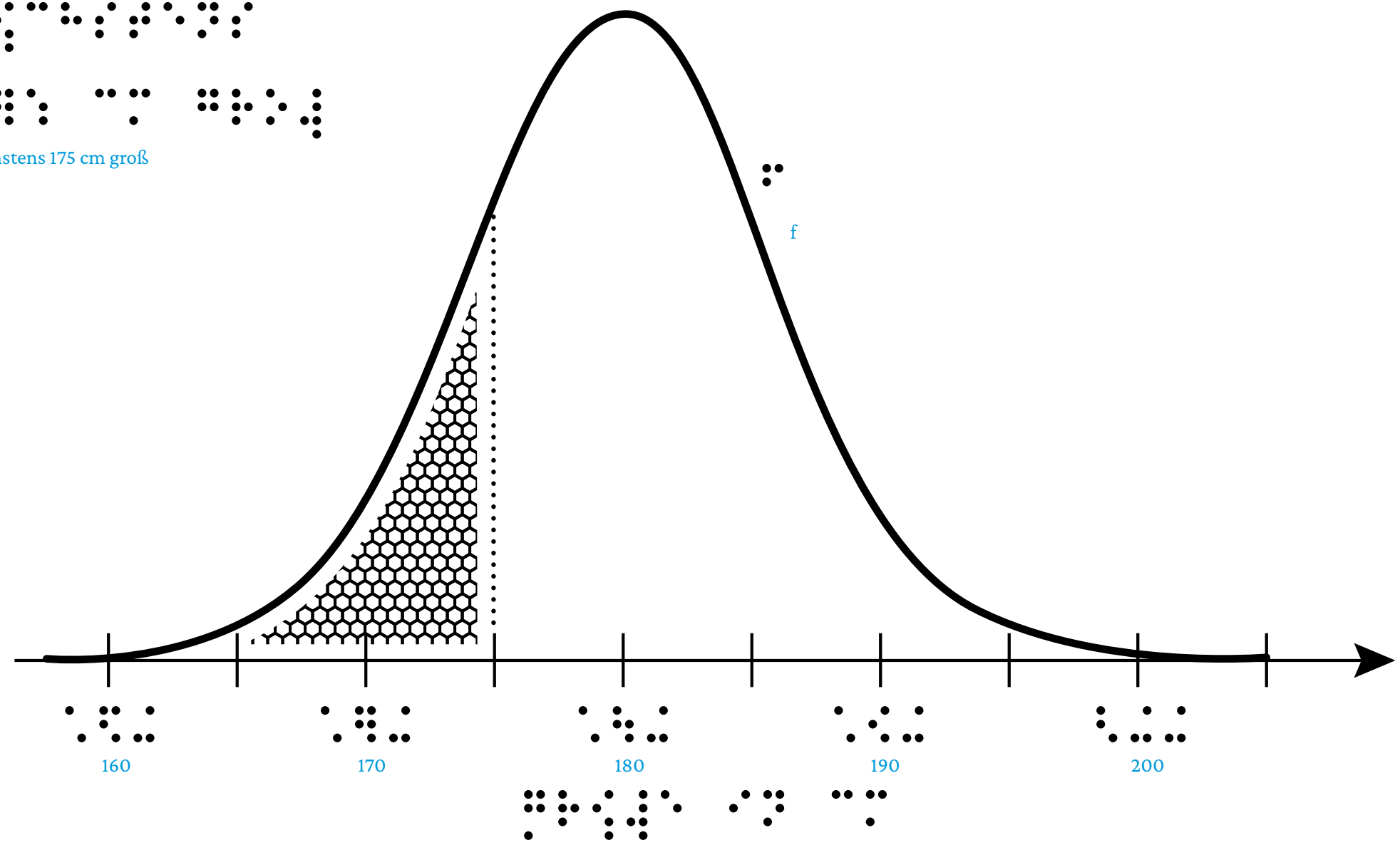

160
170
180
190
200
Größe in cm



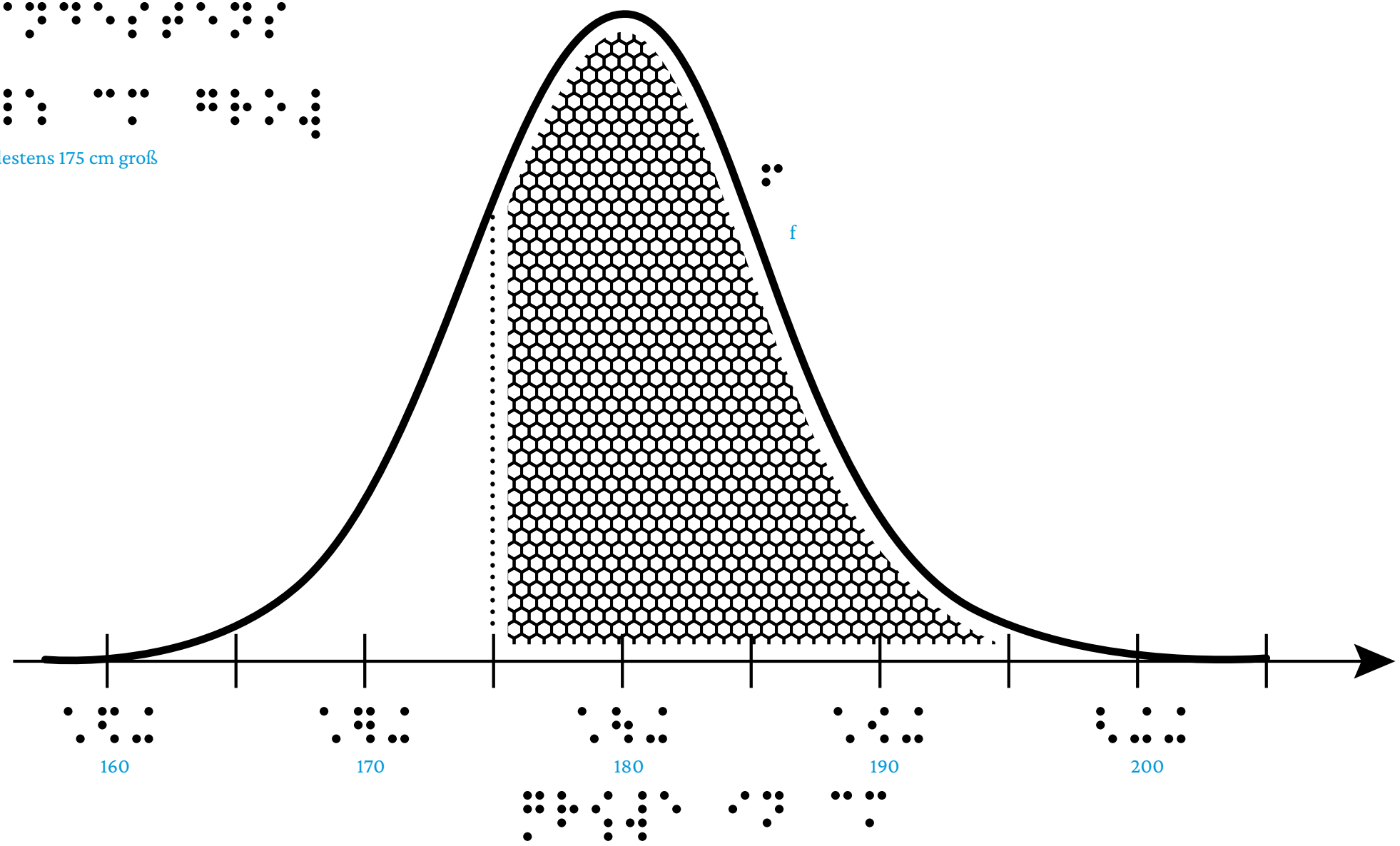
Größe in cm


f
160
170
180
190
200
Größe in cm

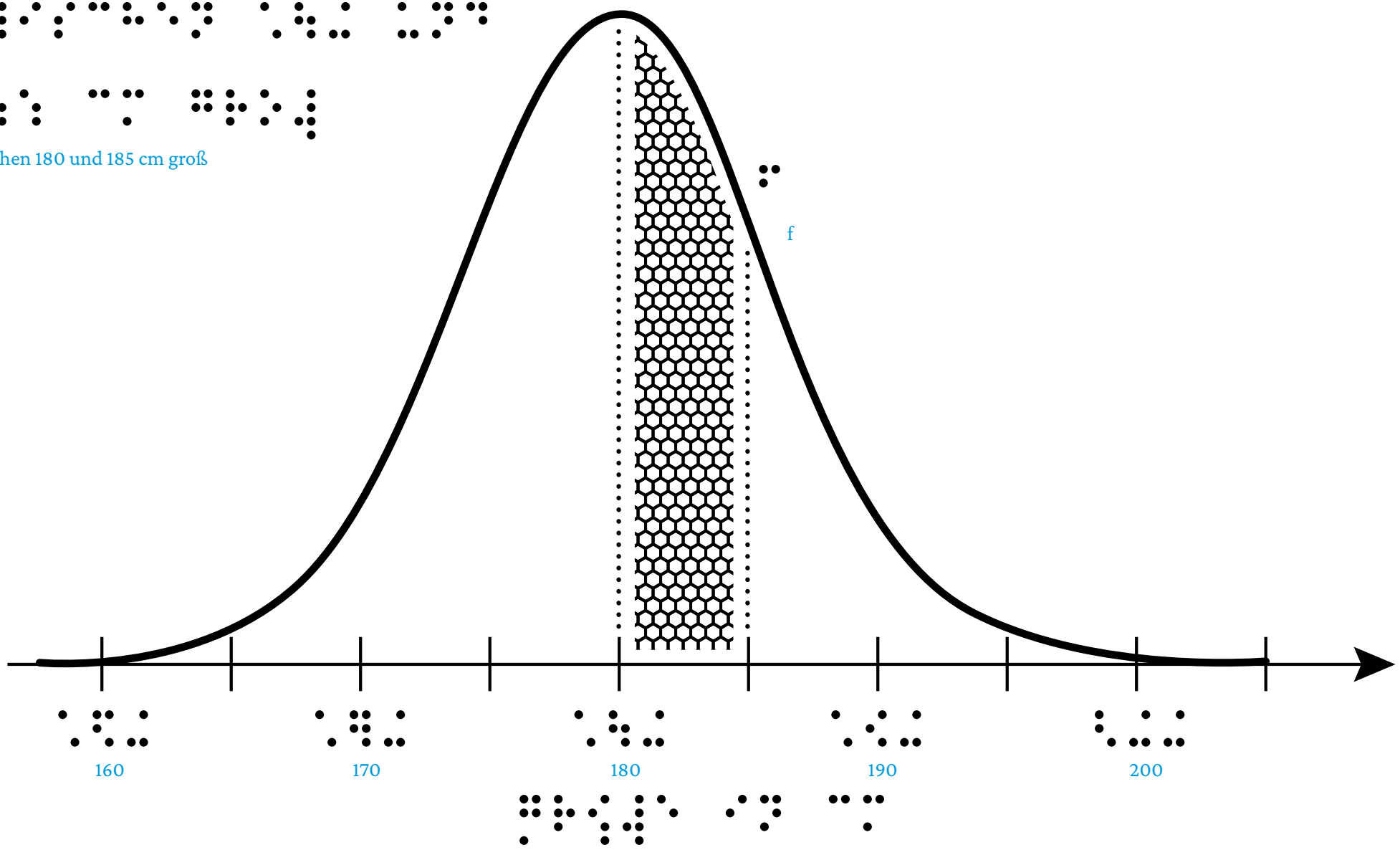
Höchstens 175 cm groß

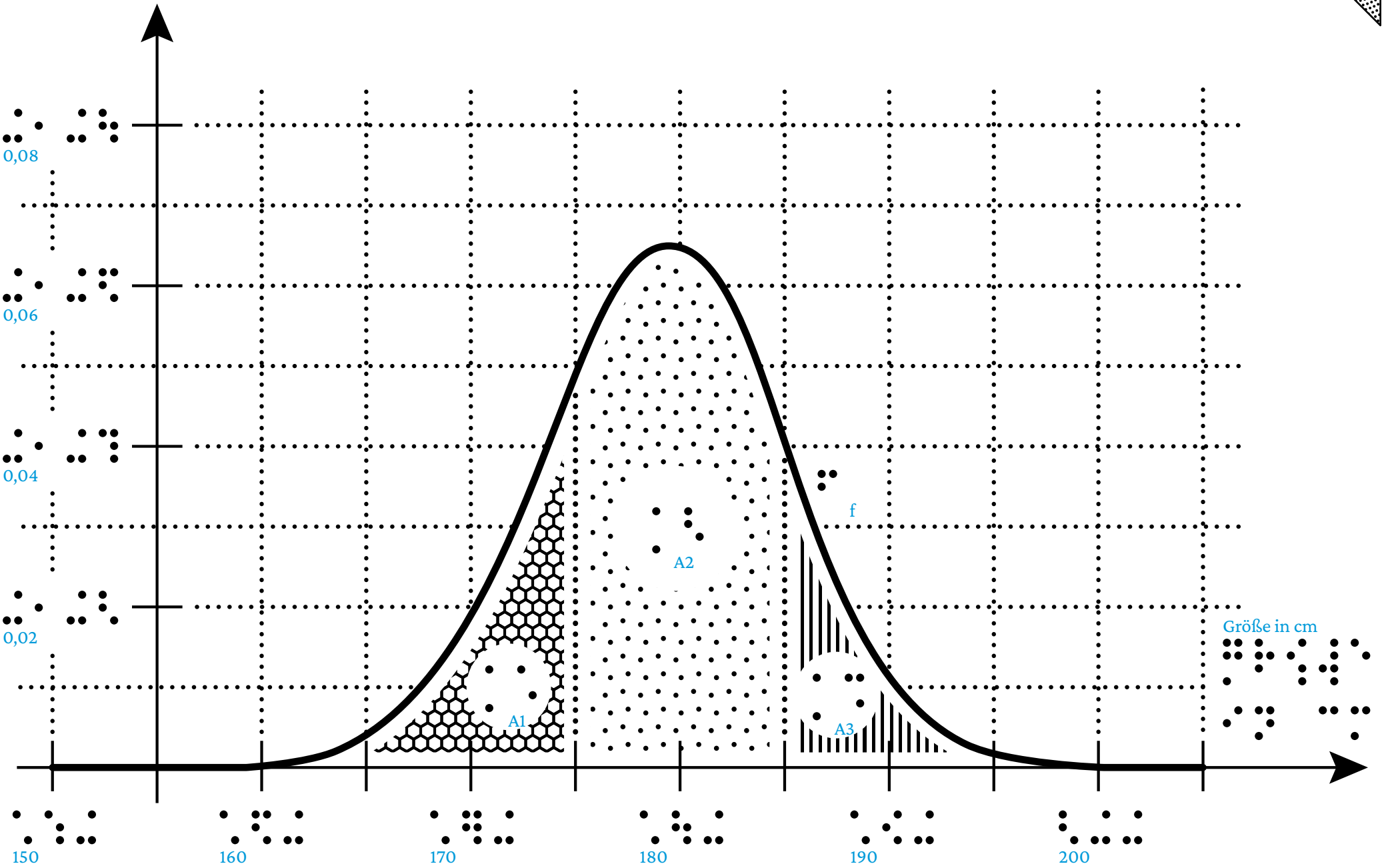


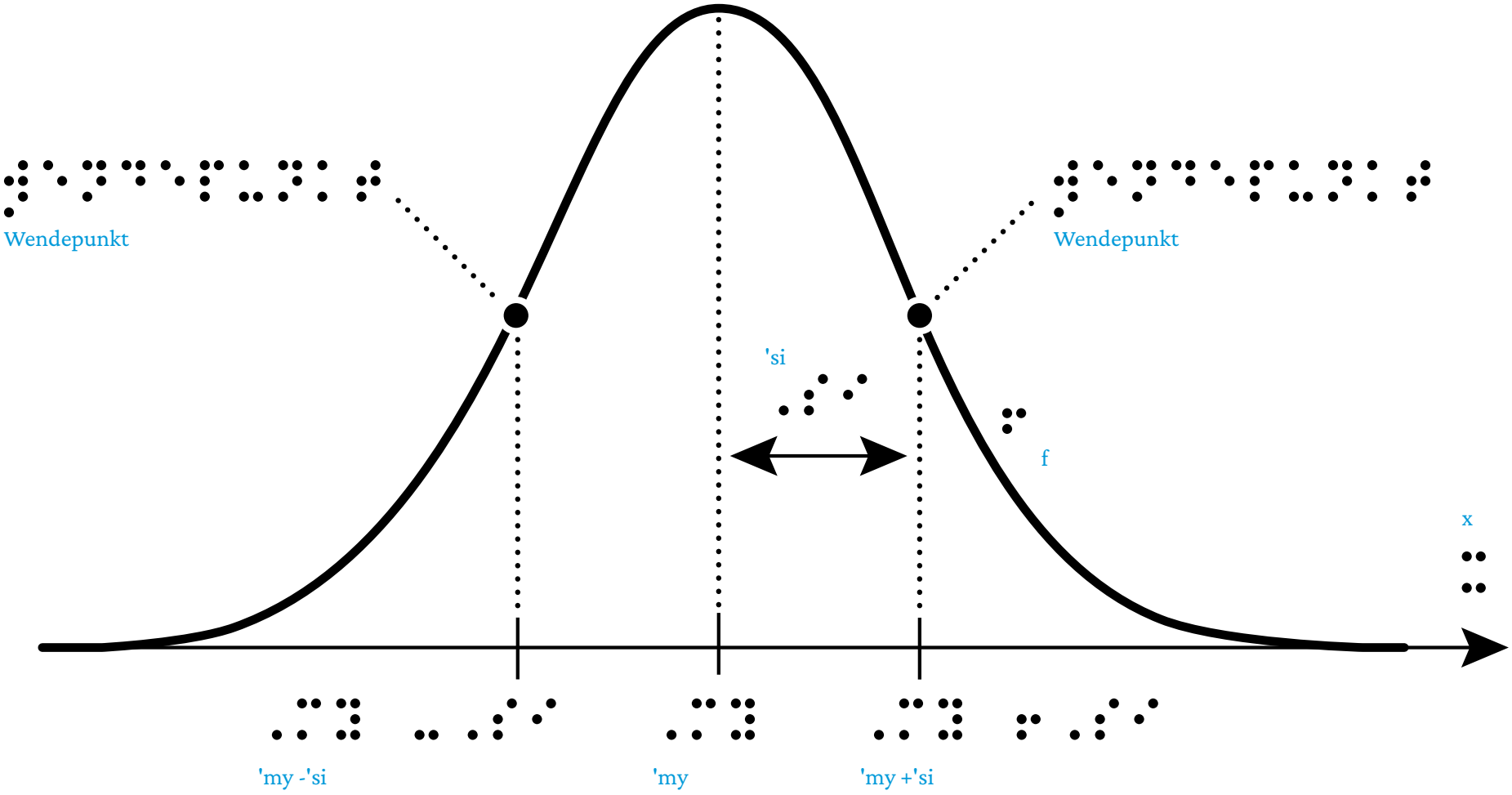
Mindestens 175 cm groß

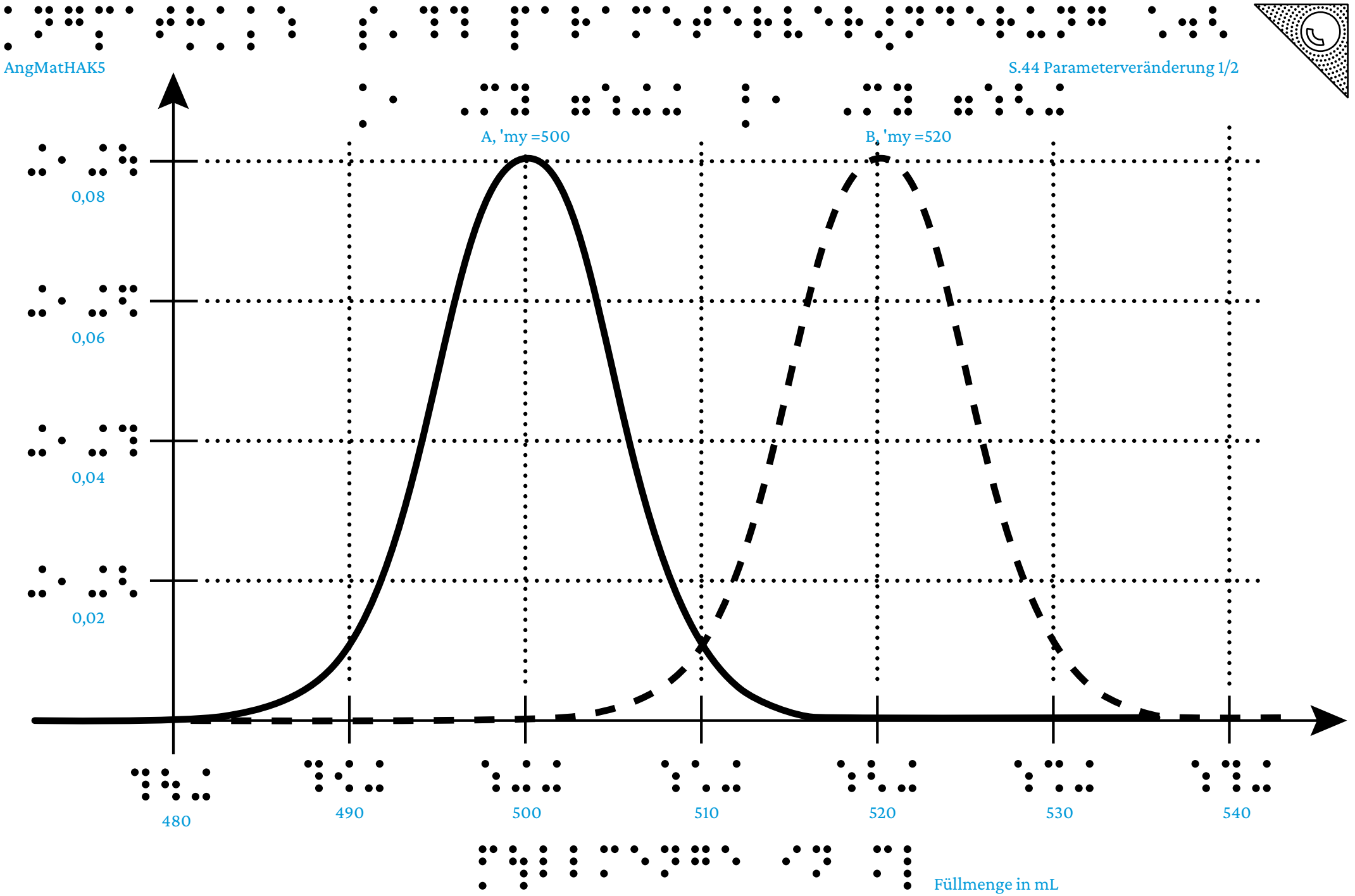


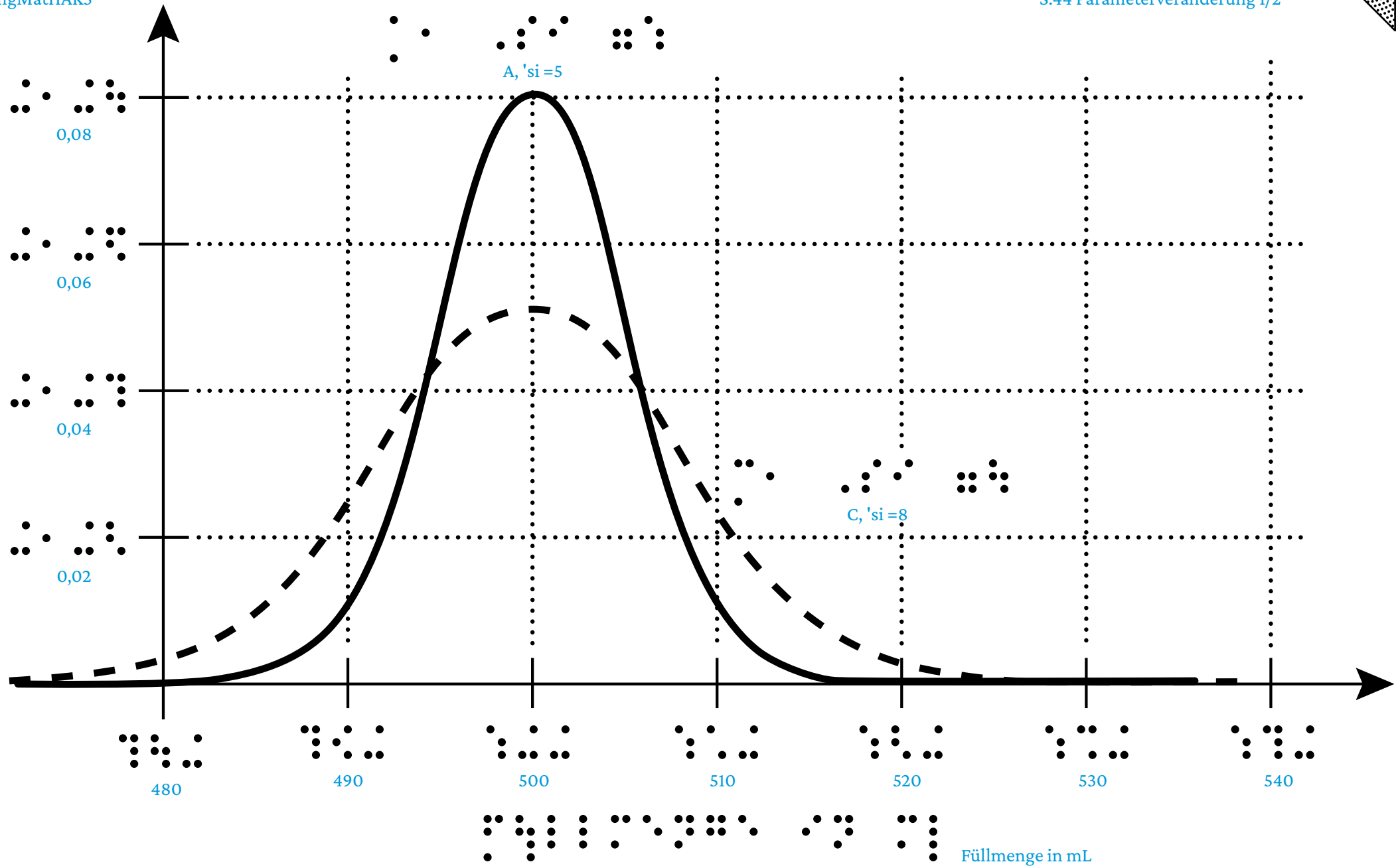
Zwischen 180 und 185 cm groß



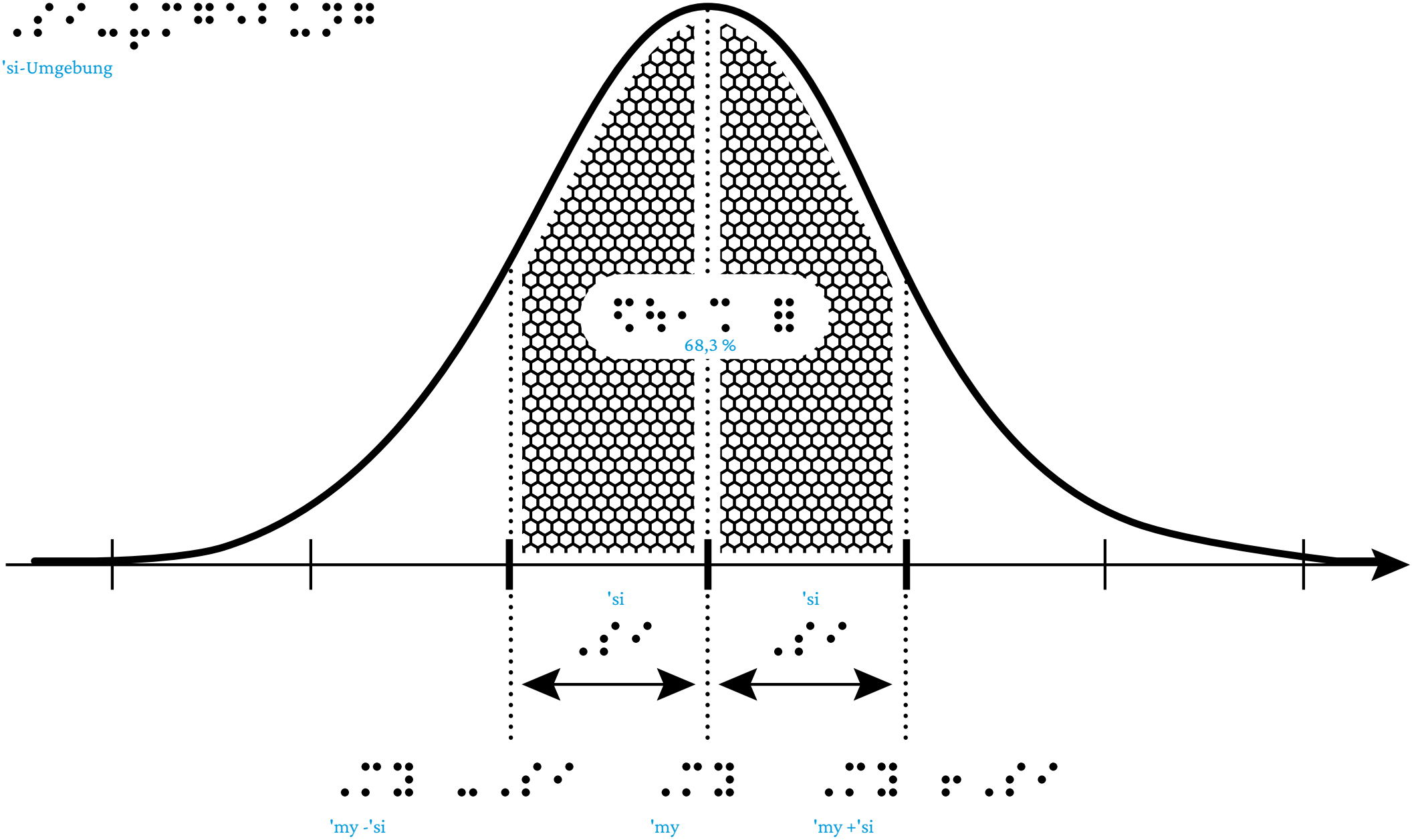

0,08
0,06
0,04
0,02
f
A1
A2
A3
Größe in cm
150
160
170
180
190
200


Wendepunkt
Wendepunkt
'si
f
x
'my -'si
'my
'my +'si

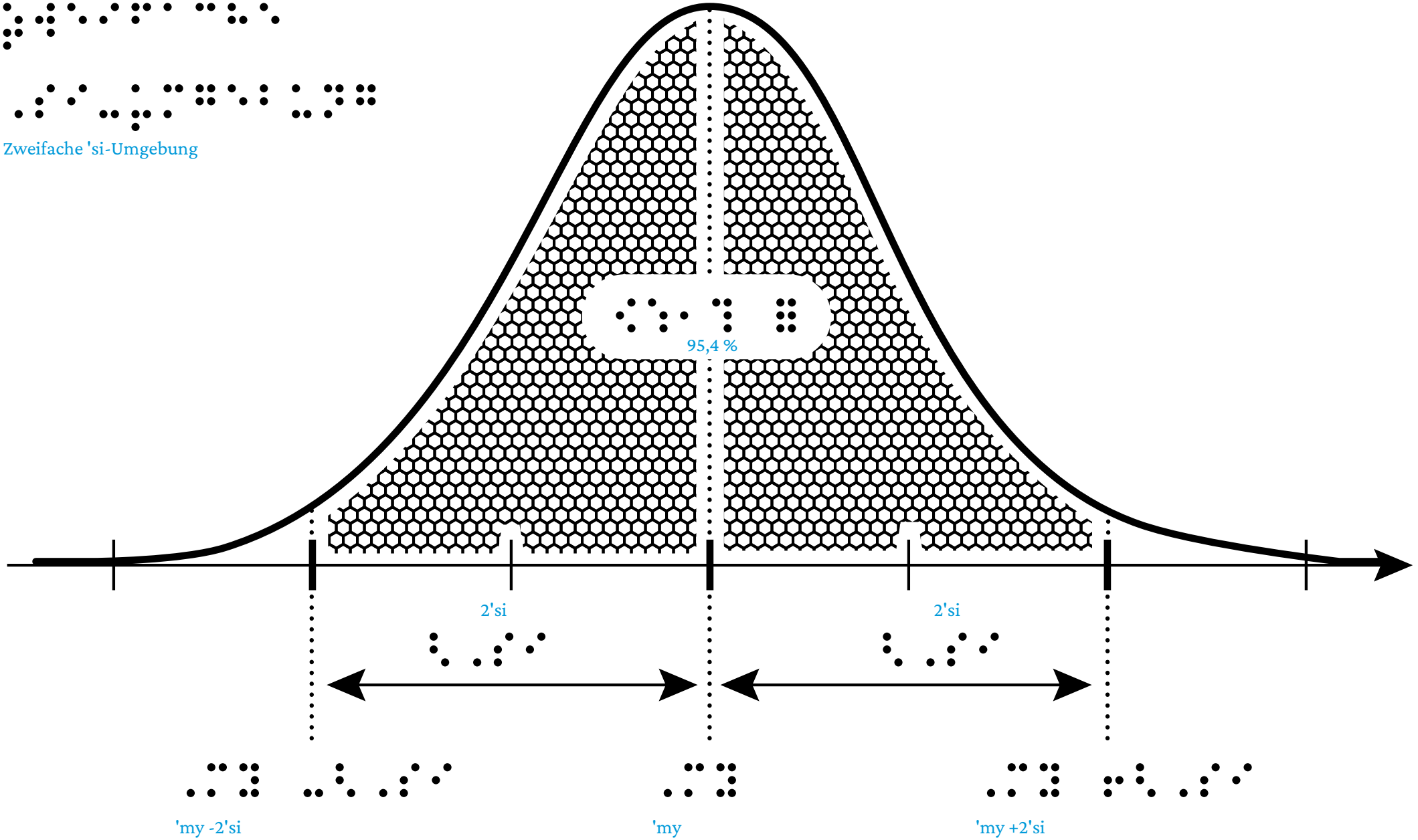

A, 'my =500
B, 'my =520
0,08
0,06
0,04
0,02
480
490
500
510
520
530
540
Füllmenge in mL


A, 'si =5
C, 'si =8
0,08
0,06
0,04
0,02
480
490
500
510
520
530
540
Füllmenge in mL

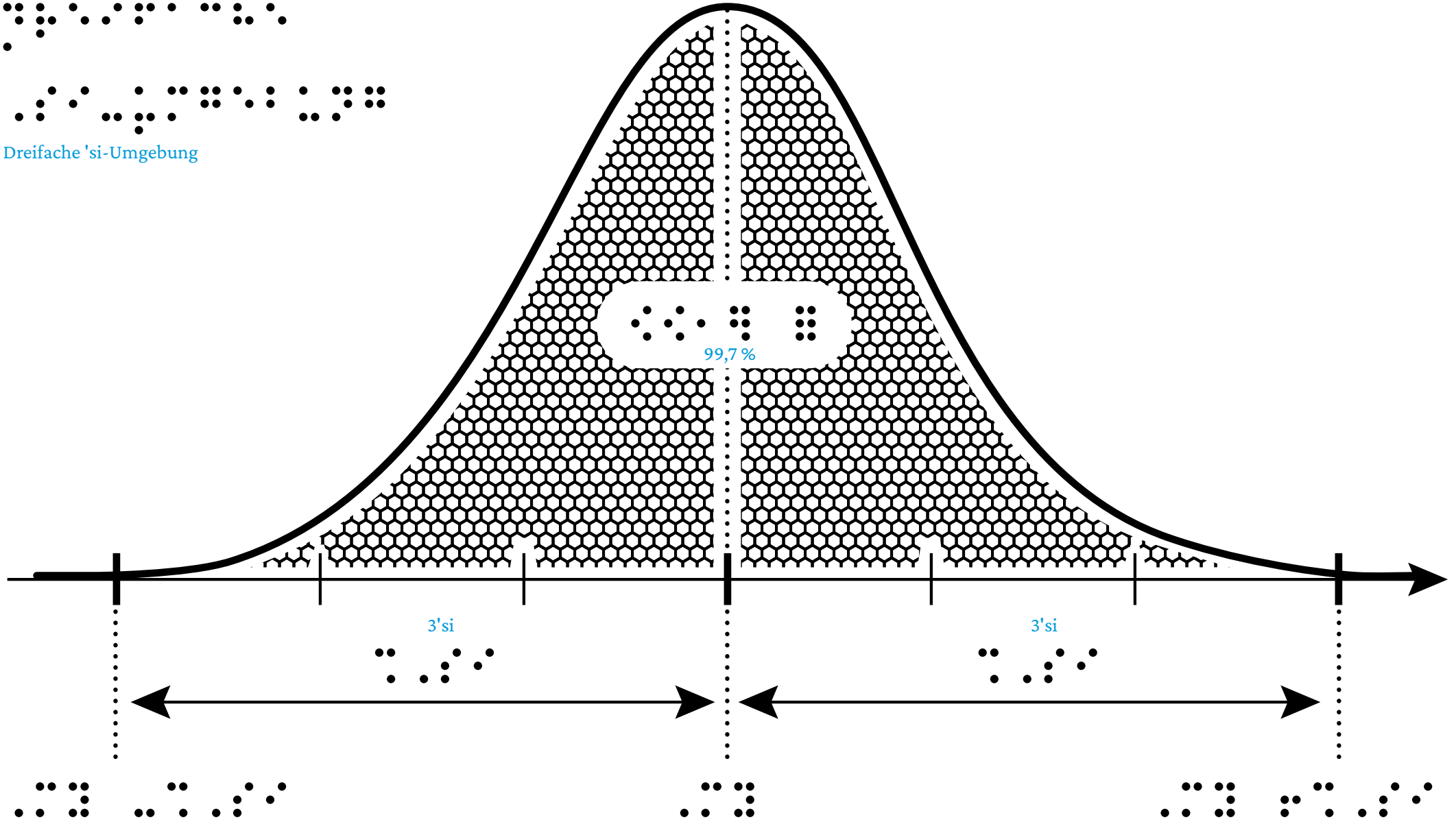
'si-Umgebung



Zweifache 'si-Umgebung

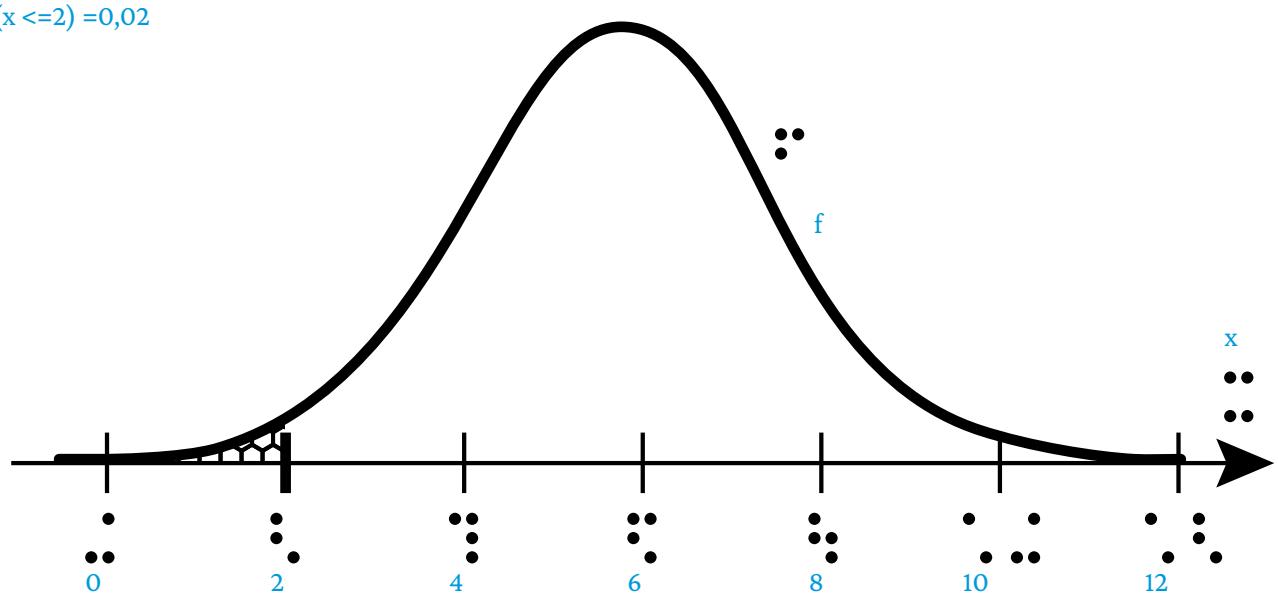


Dreifache 'si-Umgebung

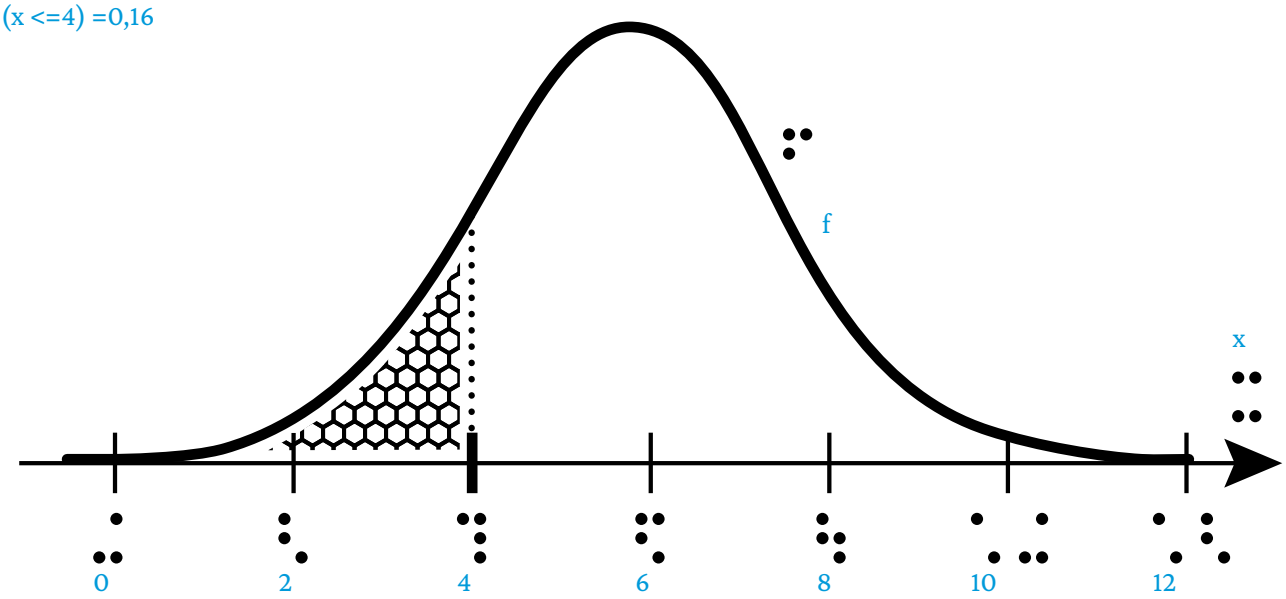


Dichtefunktion f mit verschiedenen Wahrscheinlichkeiten P(X <=x) (1/3)

F(2) =P(x <=2) =0,02

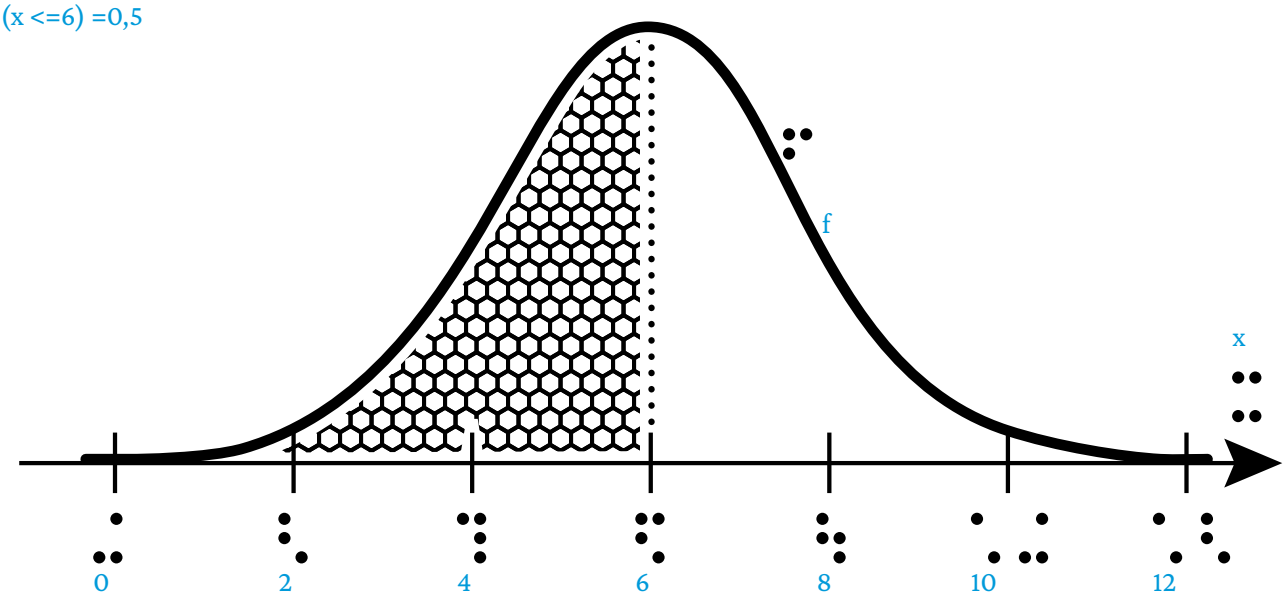


F(4) =P(x <=4) =0,16

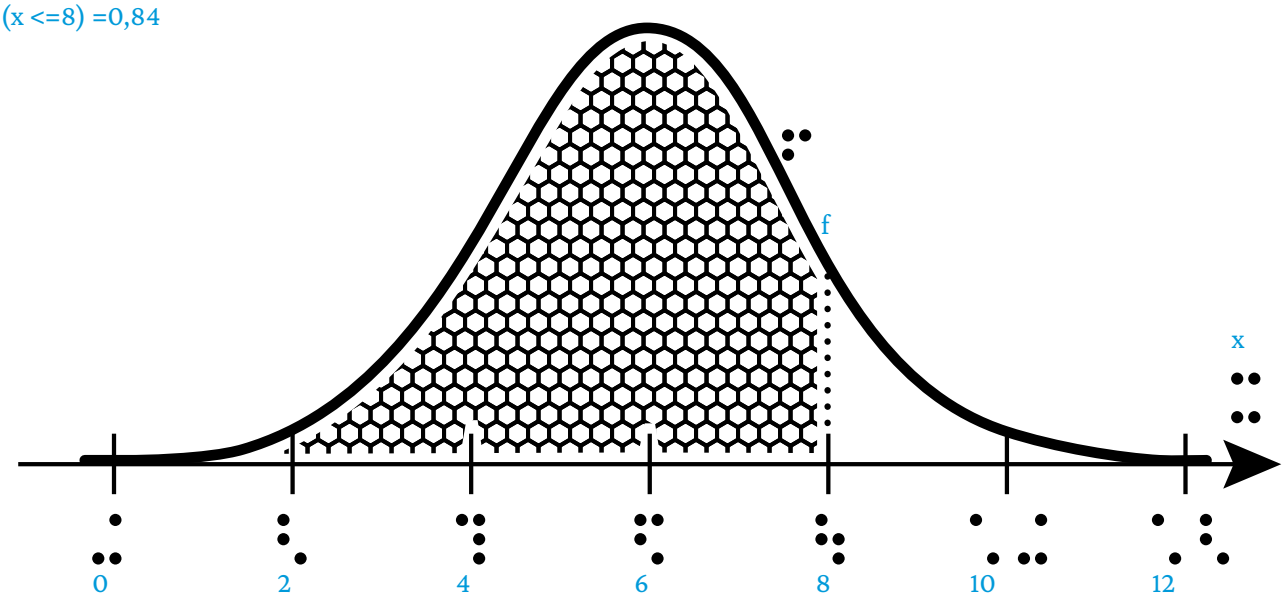


Dichtefunktion f mit verschiedenen Wahrscheinlichkeiten P(X <=x) (2/3)

F(6) =P(x <=6) =0,5

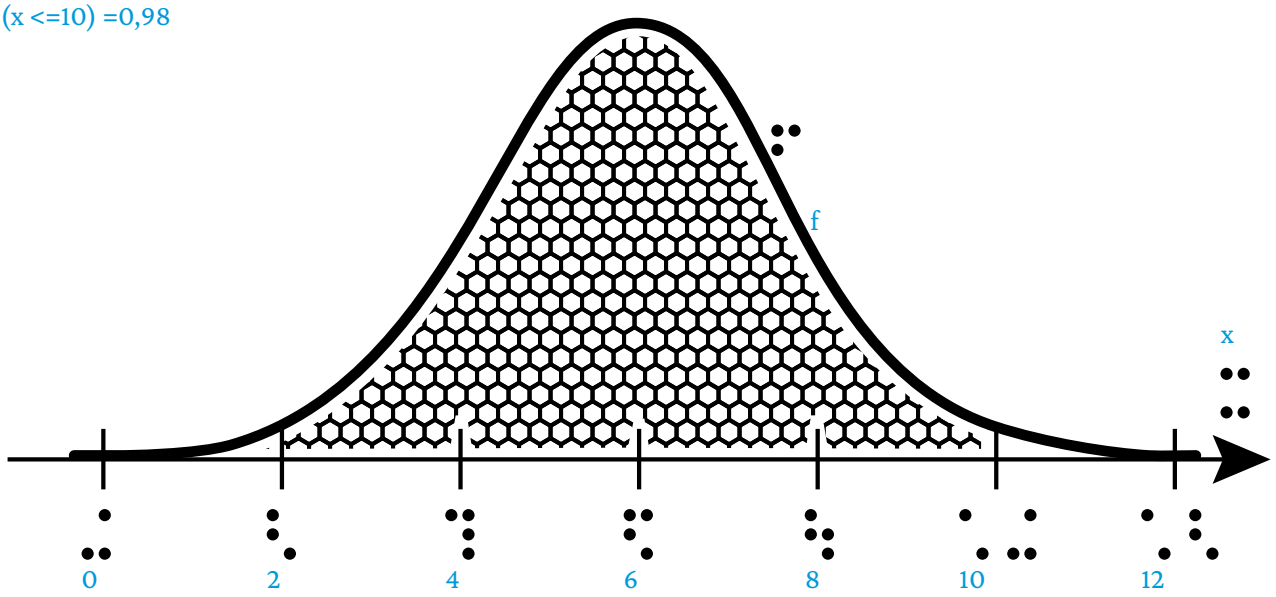


F(8) =P(x <=8) =0,84

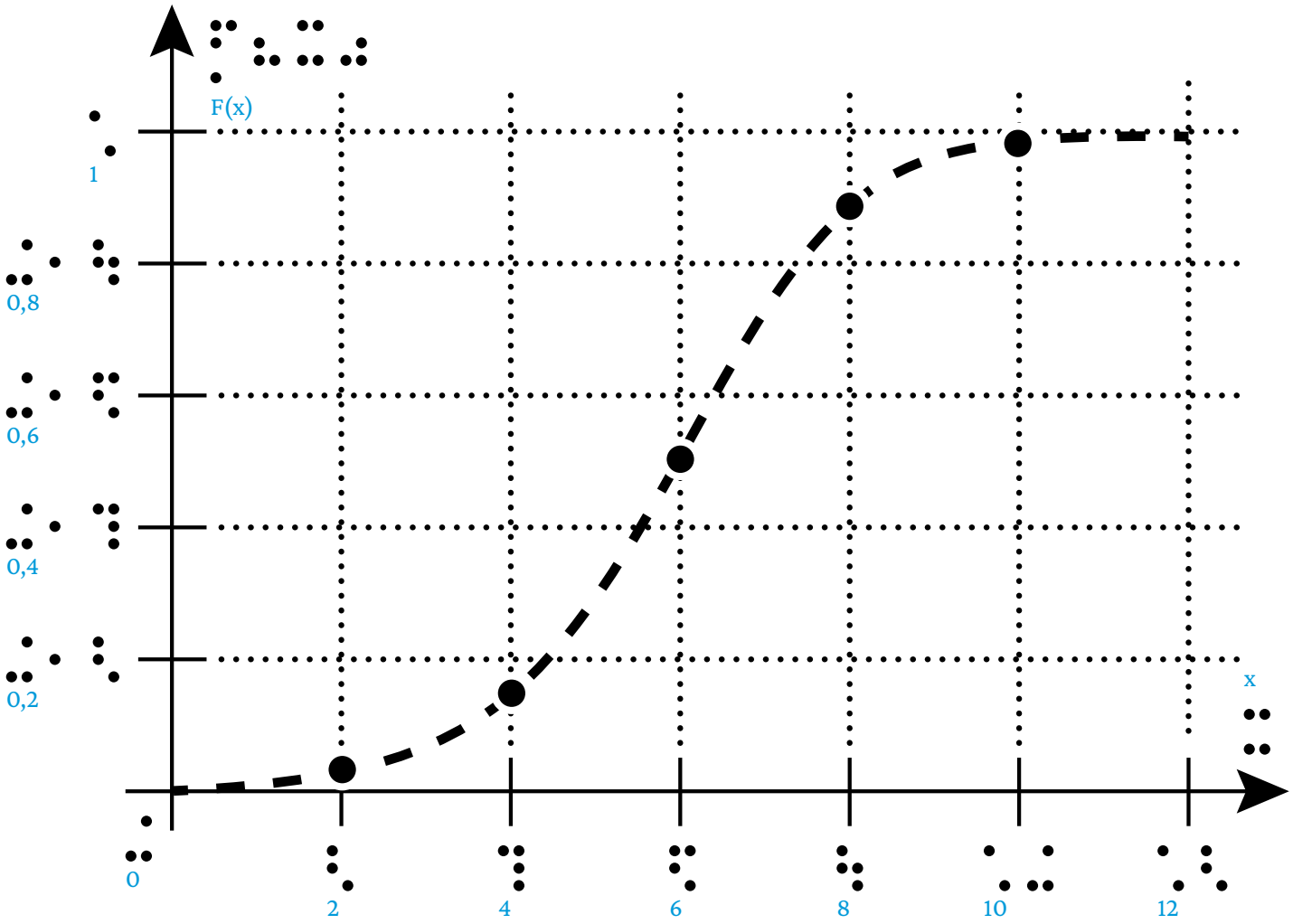


Dichtefunktion f mit... (3/3)

F(10) =P(x <=10) =0,98

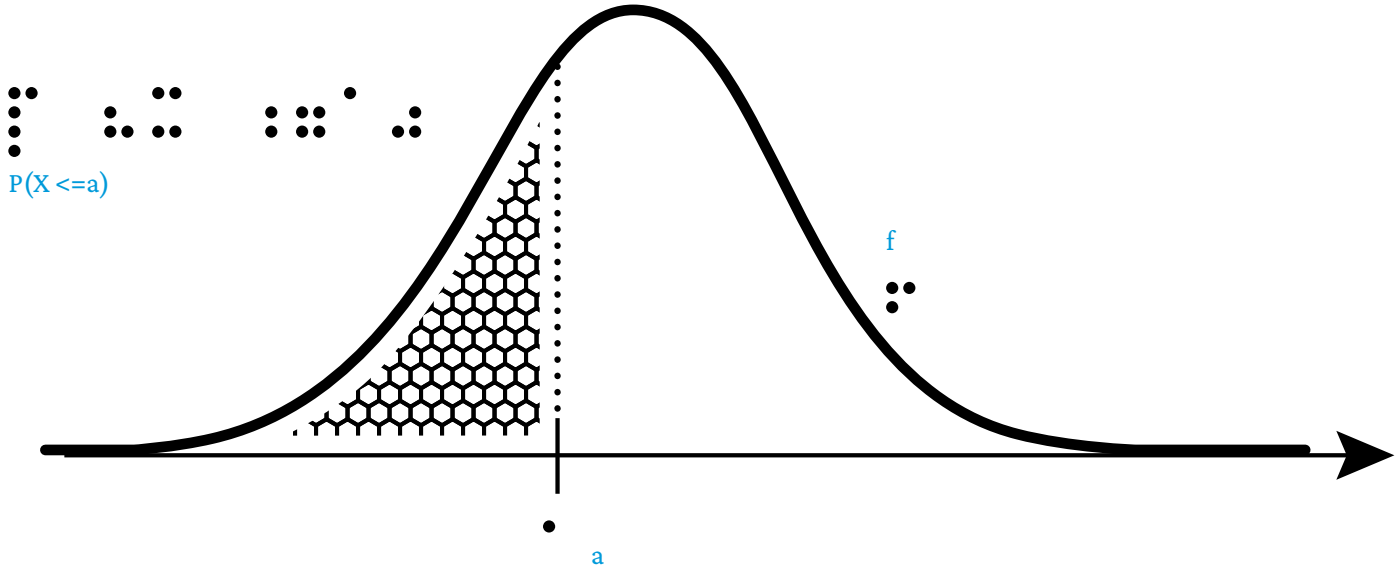


Verteilungsfunktion F

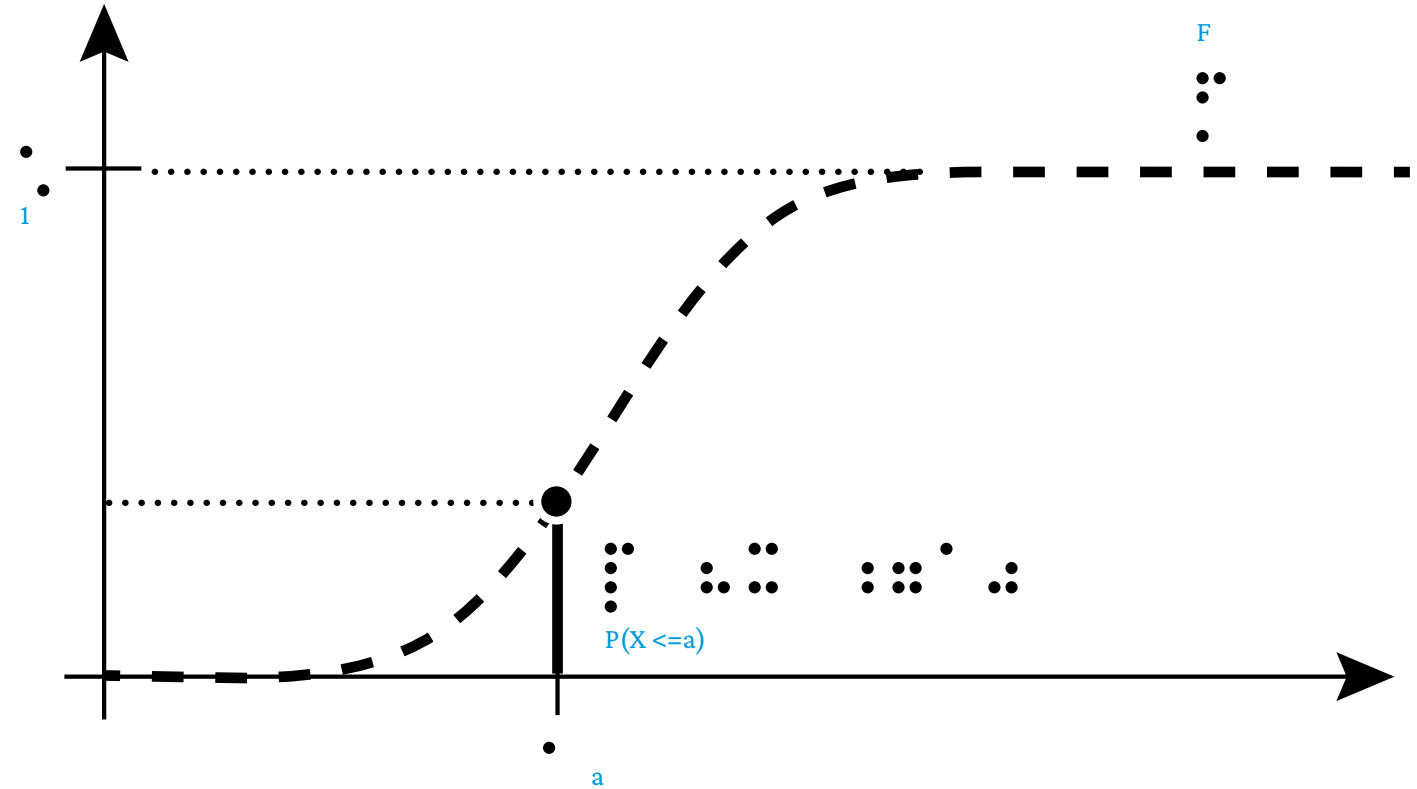


Wahrscheinlichkeitsermittlung 1/3

mittels der Dichtefunktion f

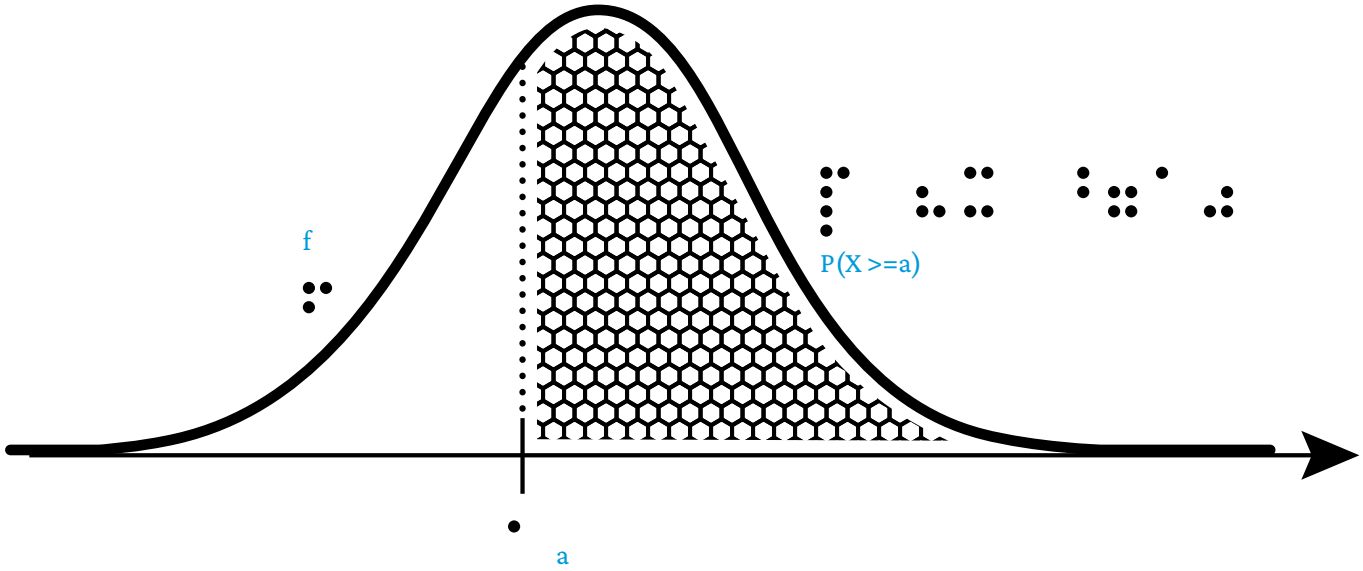


mittels der Verteilungsfunktion F

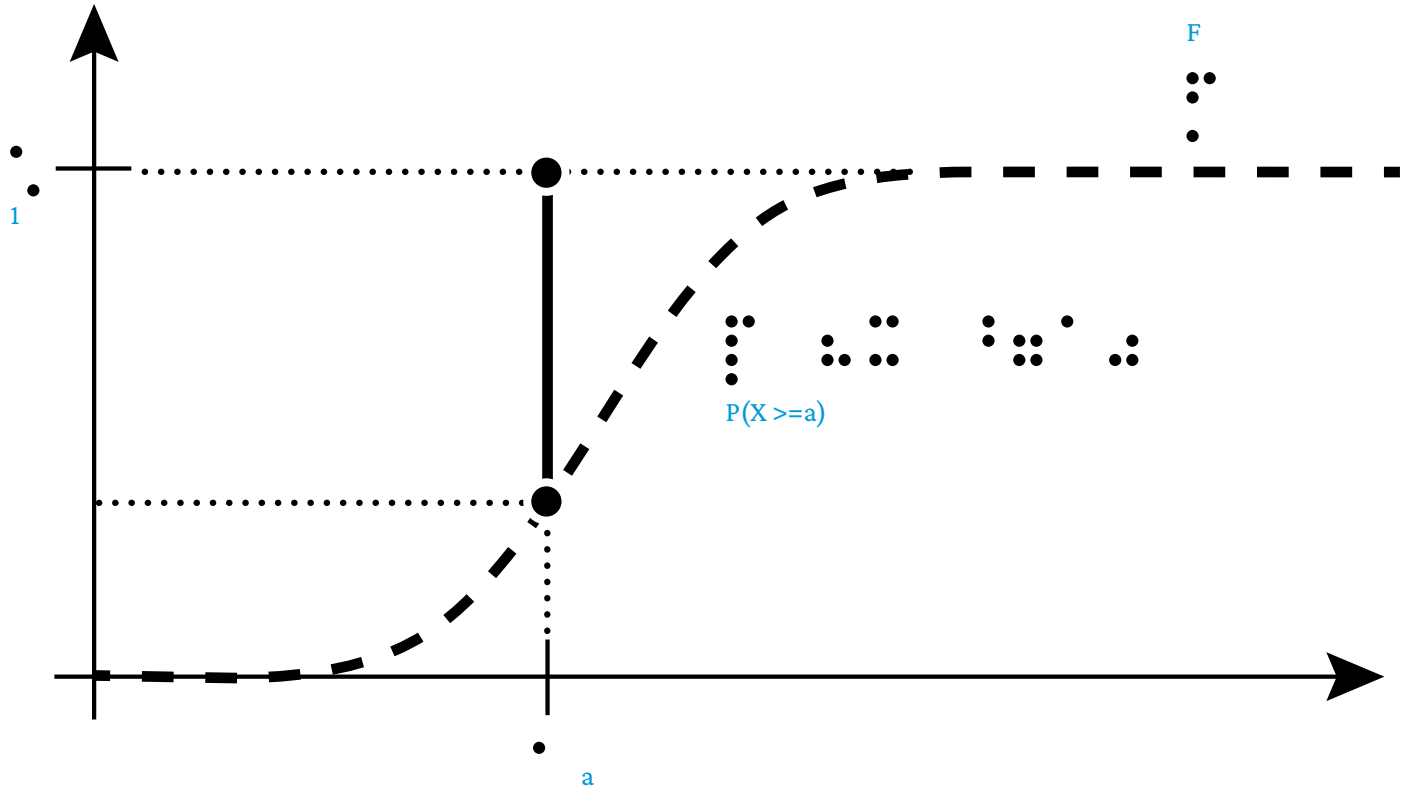


Wahrscheinlichkeitsermittlung 2/3

mittels der Dichtefunktion f

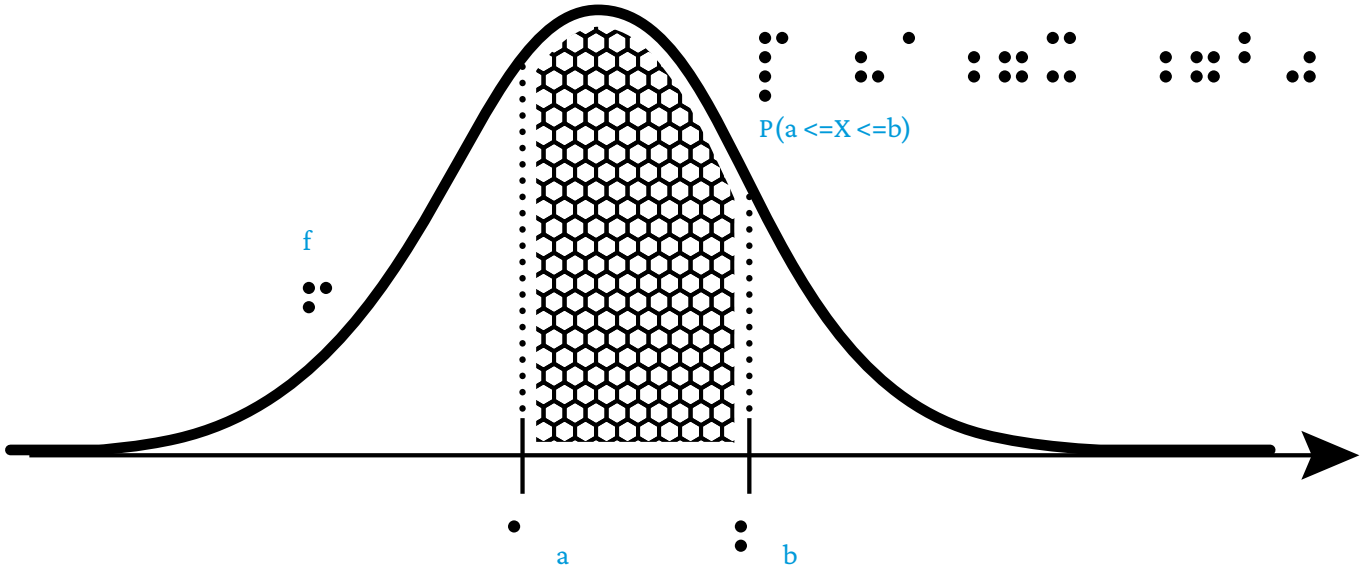


mittels der Verteilungsfunktion F

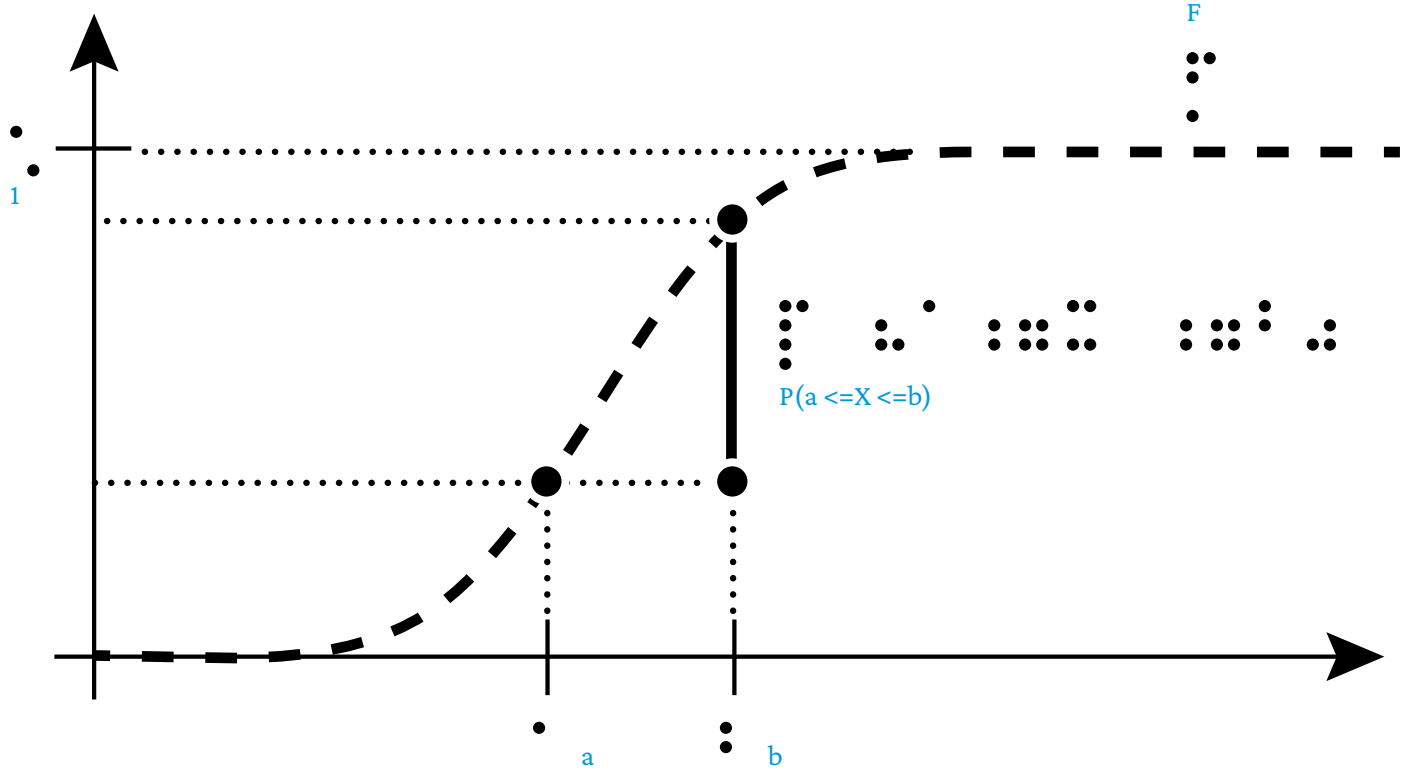


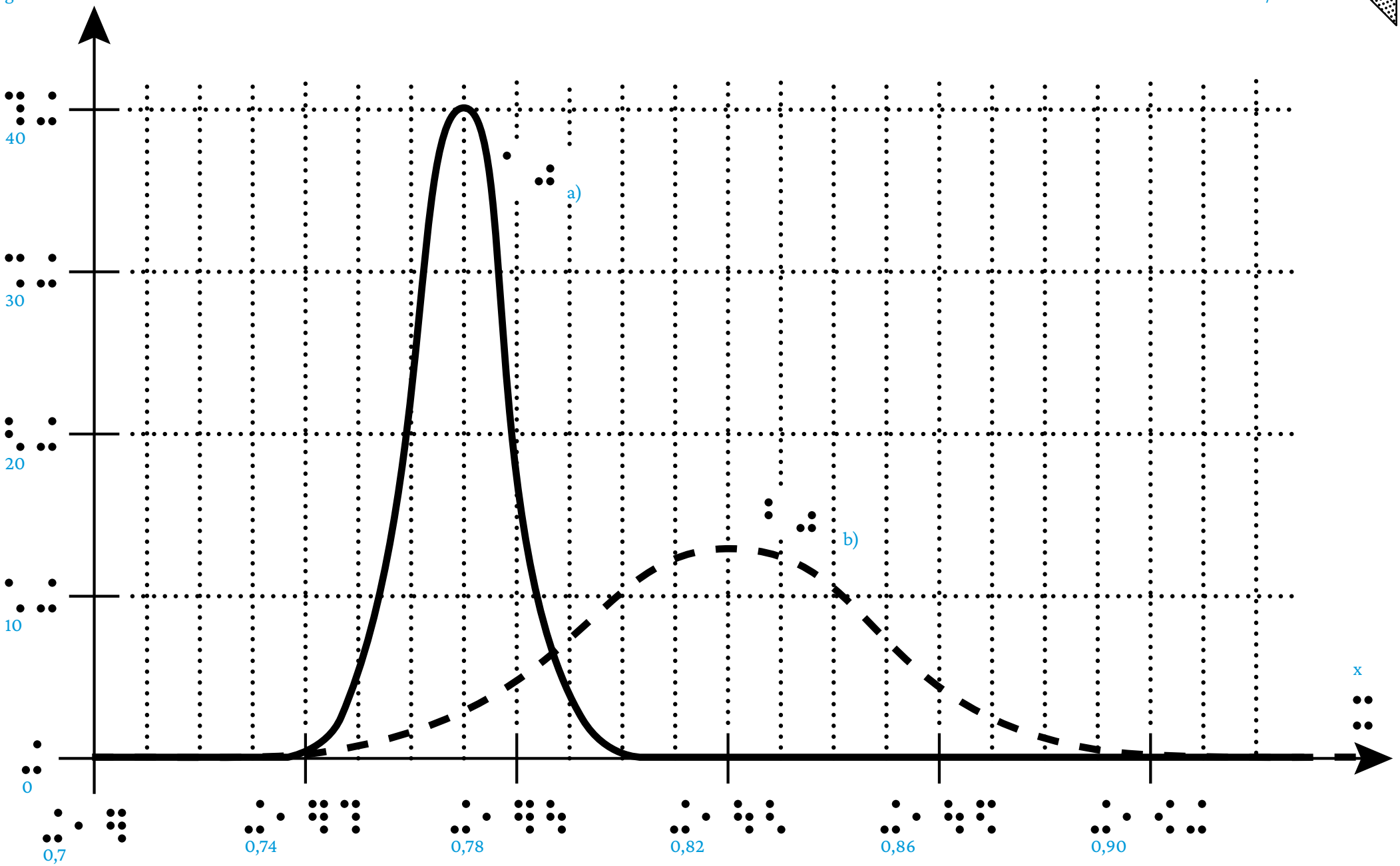
Wahrscheinlichkeitsermittlung 3/3

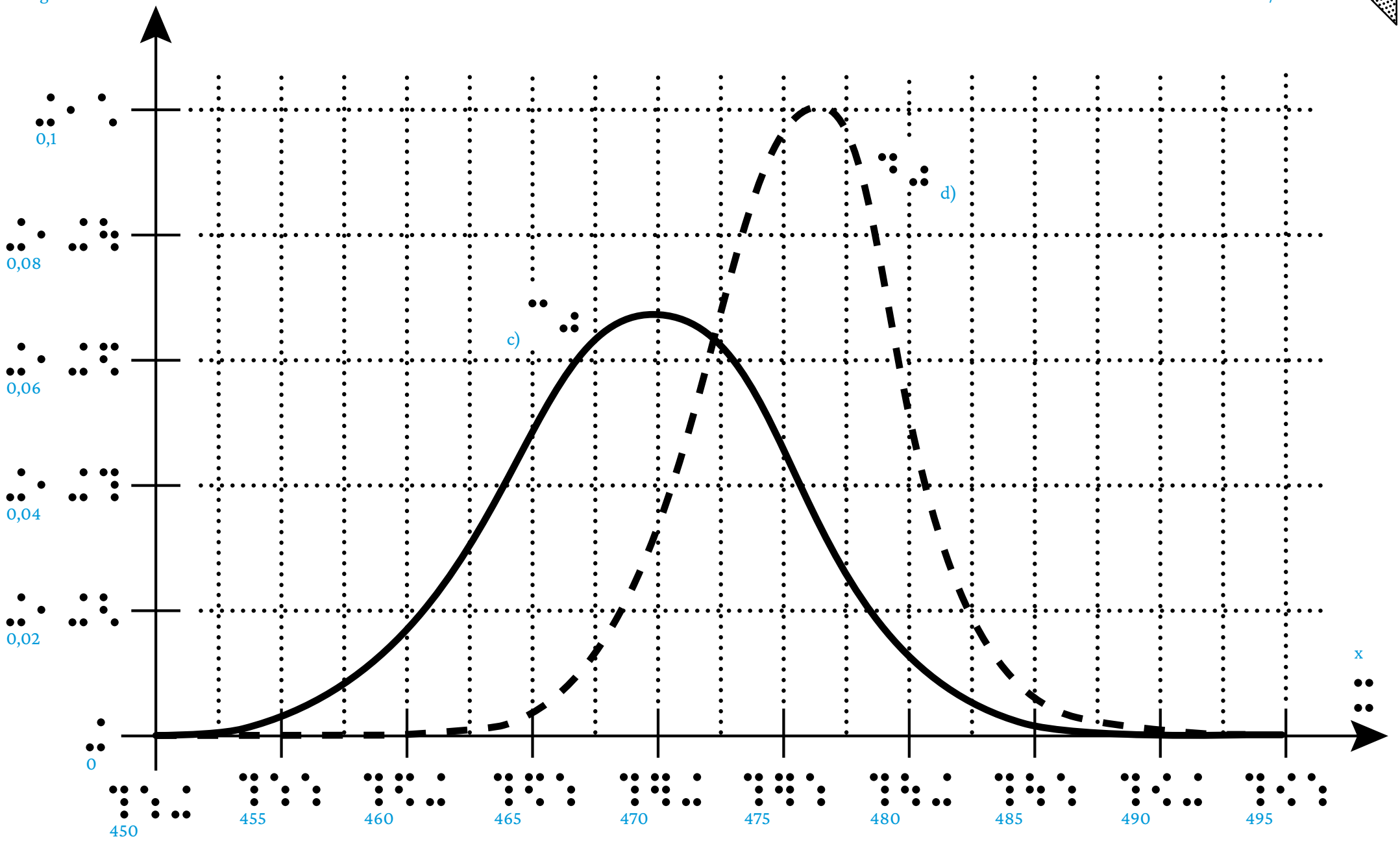
mittels der Dichtefunktion f

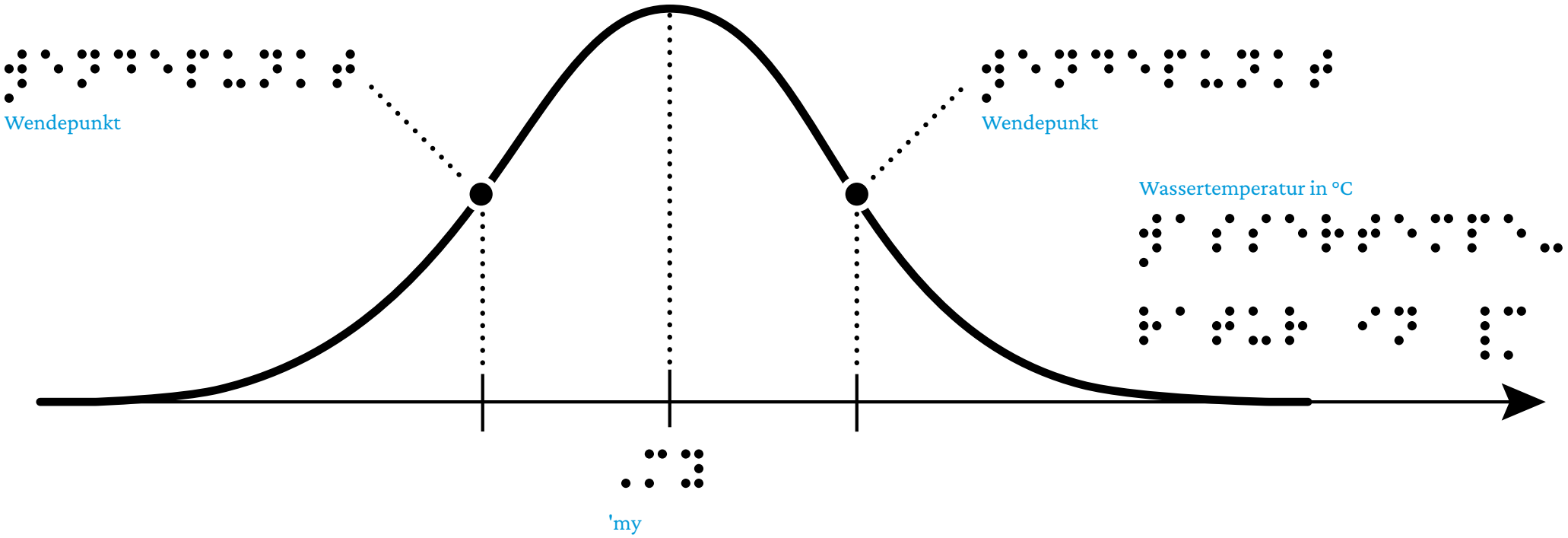


mittels der Verteilungsfunktion F

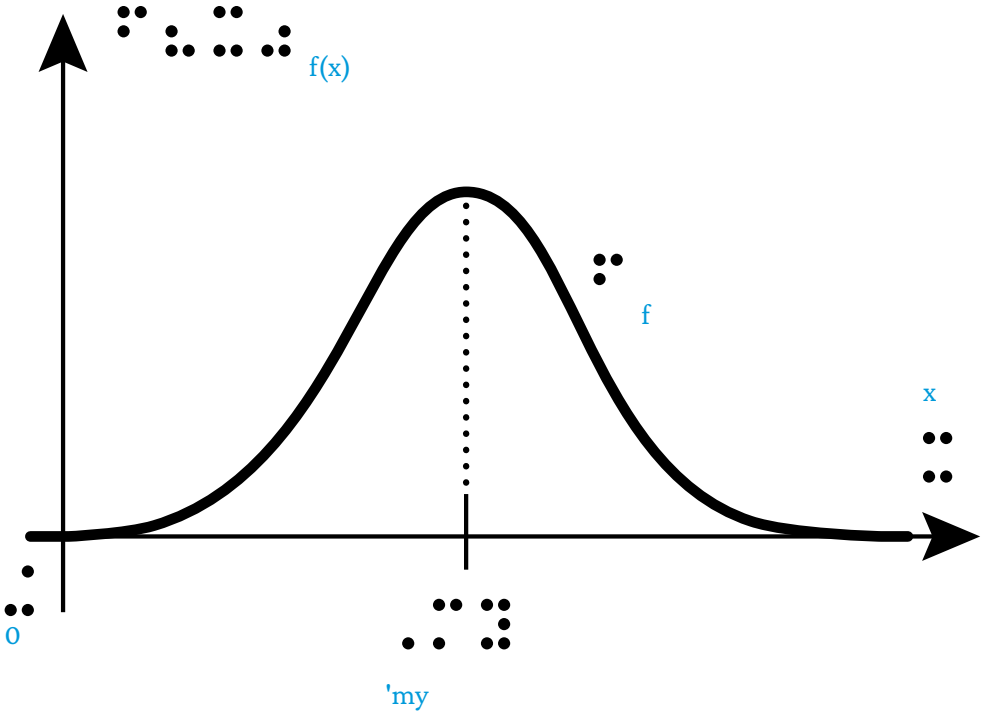


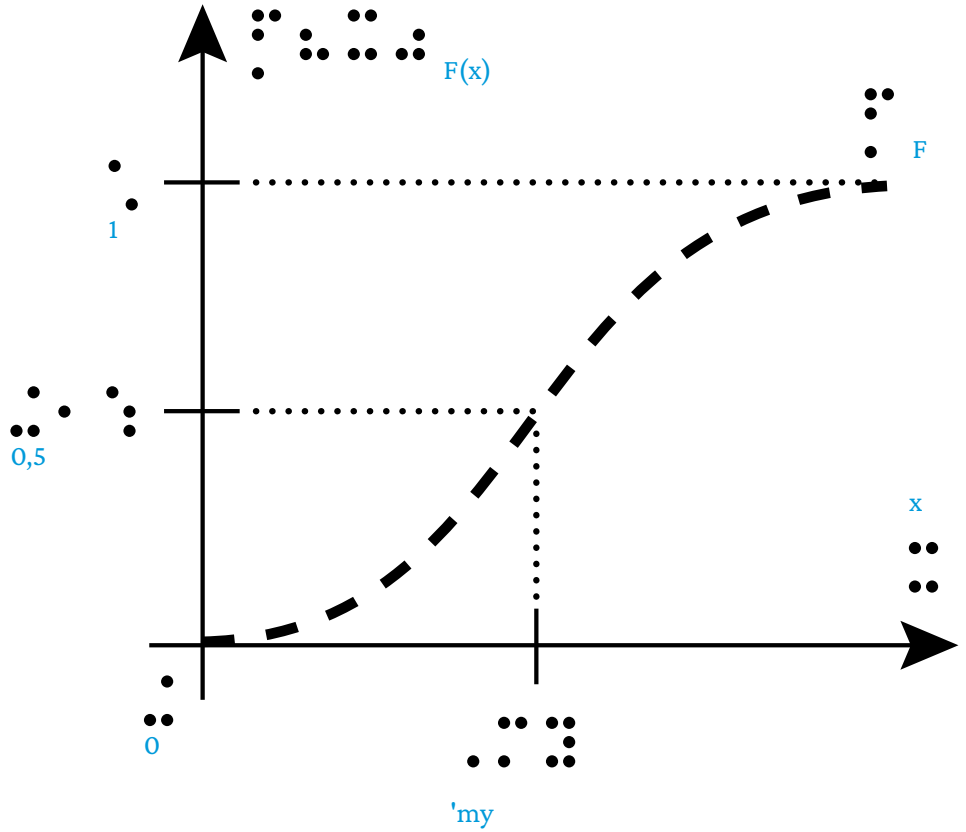

40
30
20
10
0
a)
b)
x
0,7
0,74
0,78
0,82
0,86
0,90


0,1
0,08
0,06
0,04
0,02
0
c)
d)
x
450
455
460
465
470
475
480
485
490
495

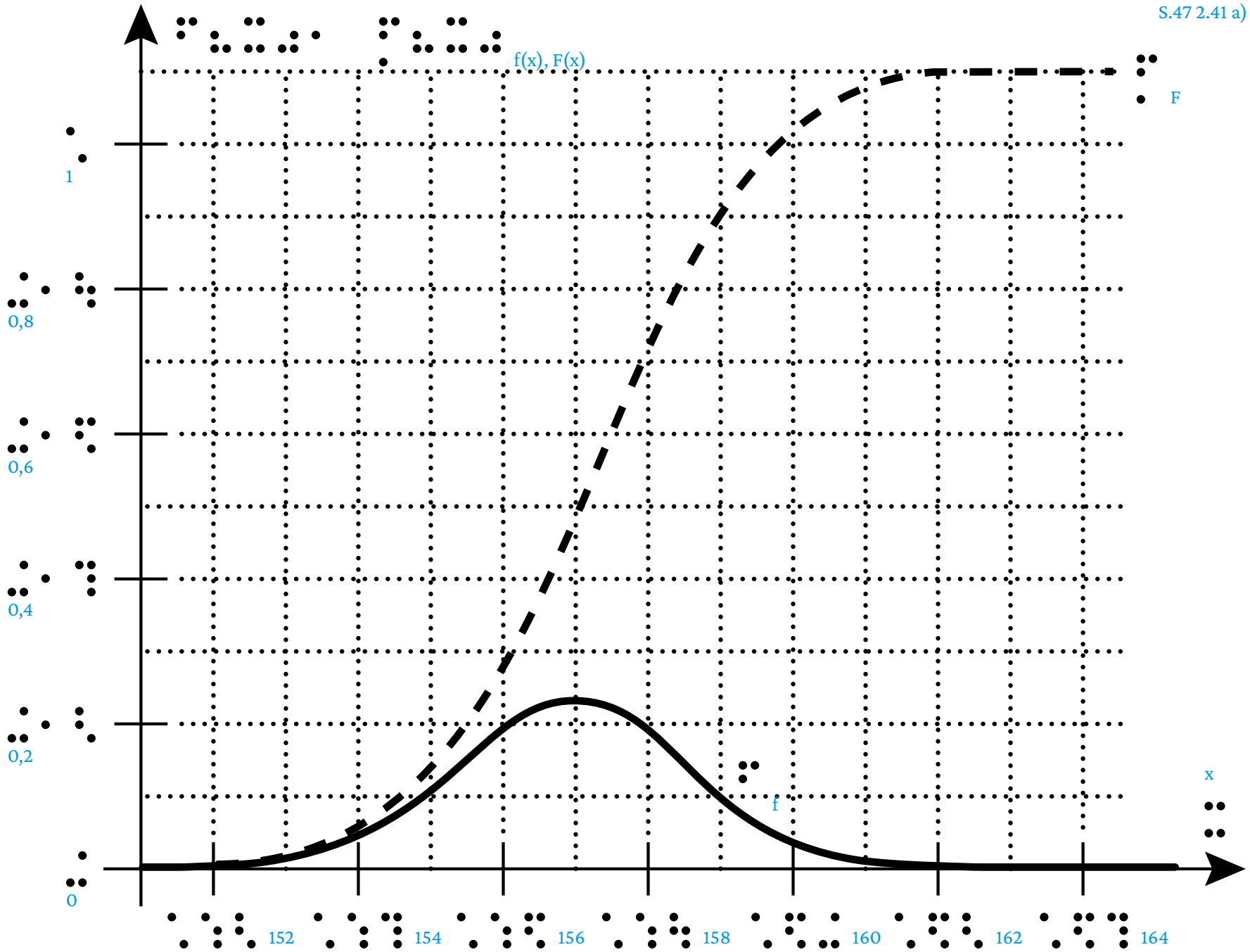

Wendepunkt
Wendepunkt
Wassertemperatur in °C
'my

F ist eine Stammfunktion von F ='int[f]



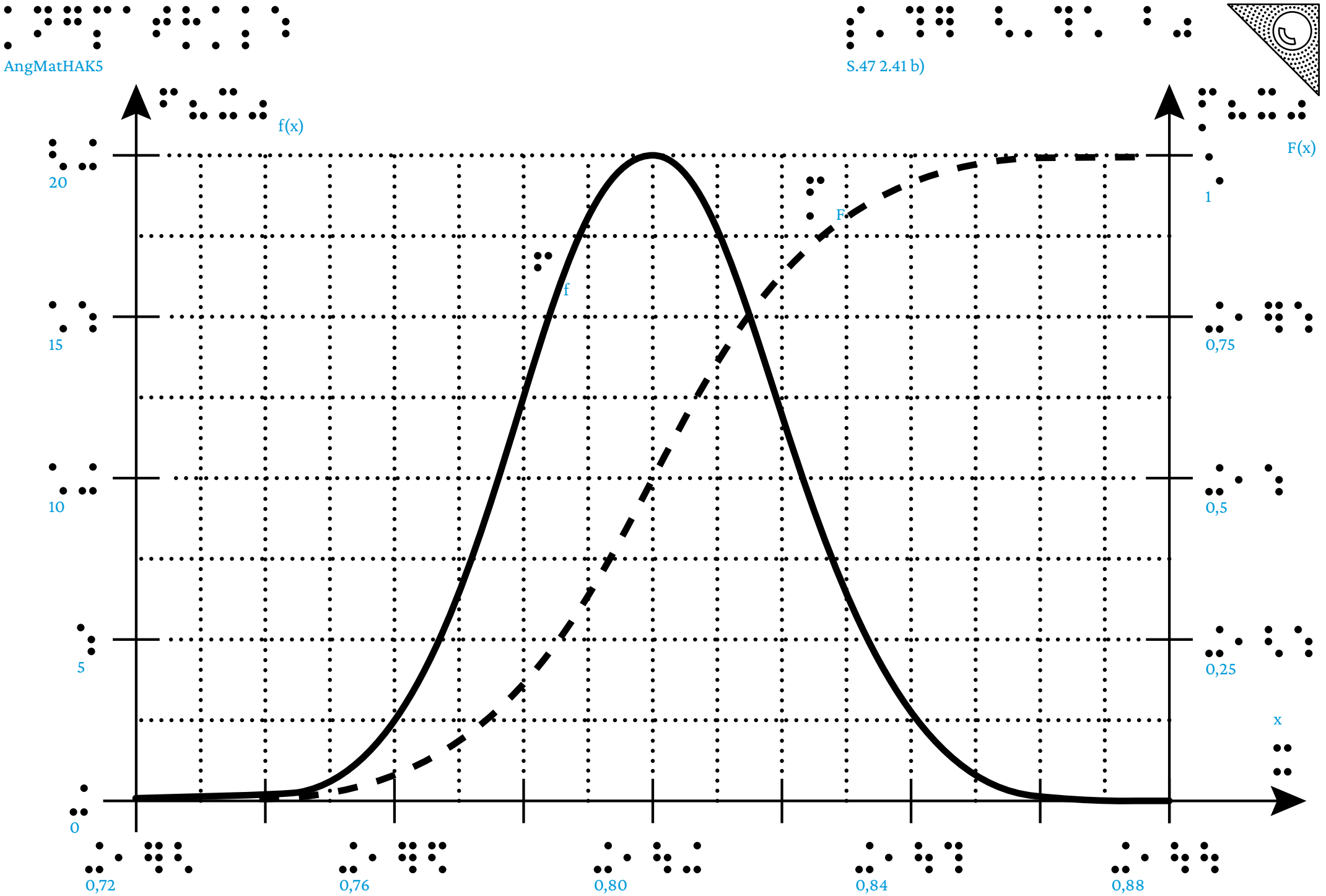


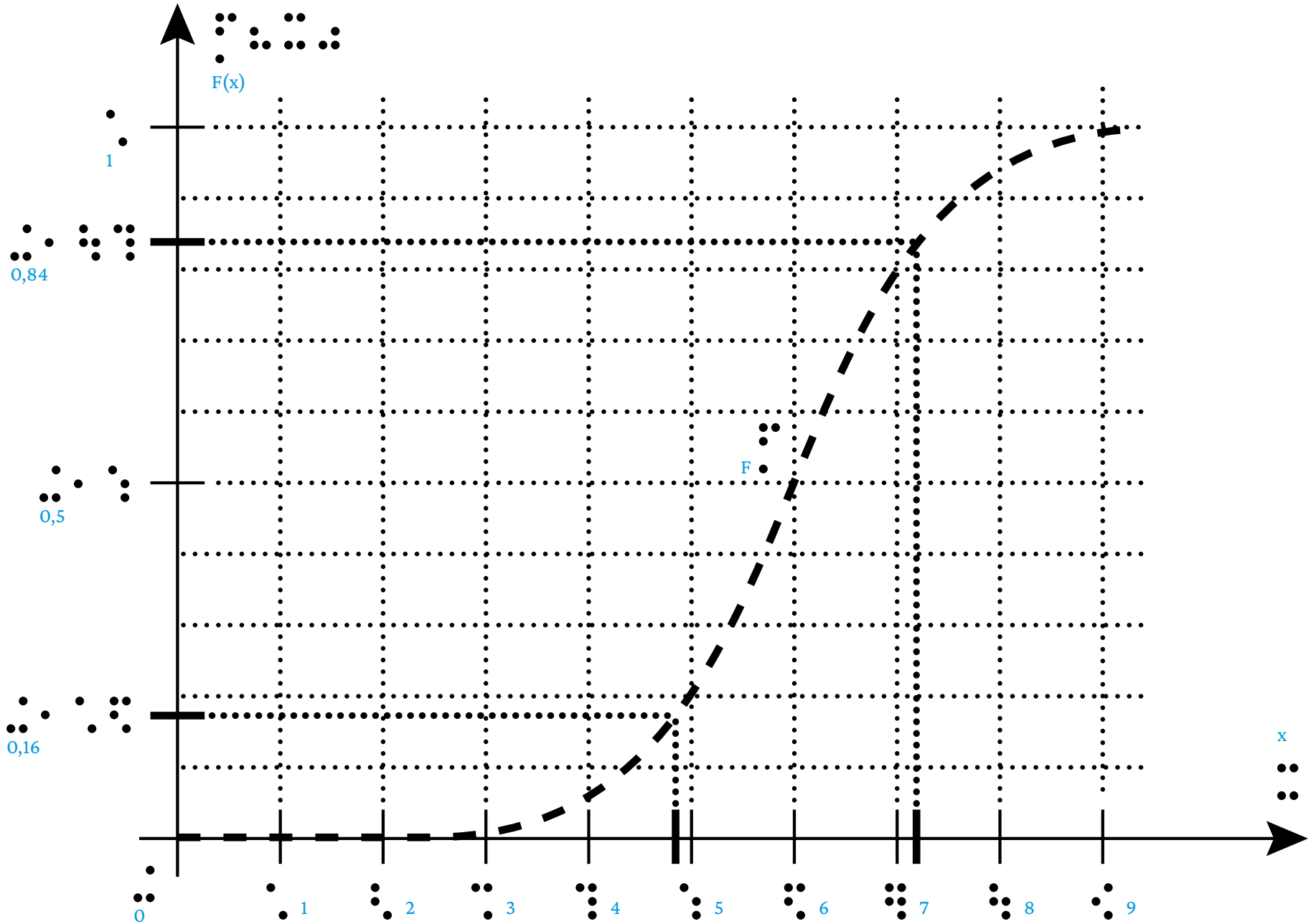
f ist die Ableitung von F: F' =f


f(x), F(x)
F
1
0,8
0,6
0,4
0,2
0
f
x
152
154
156
158
160
162
164

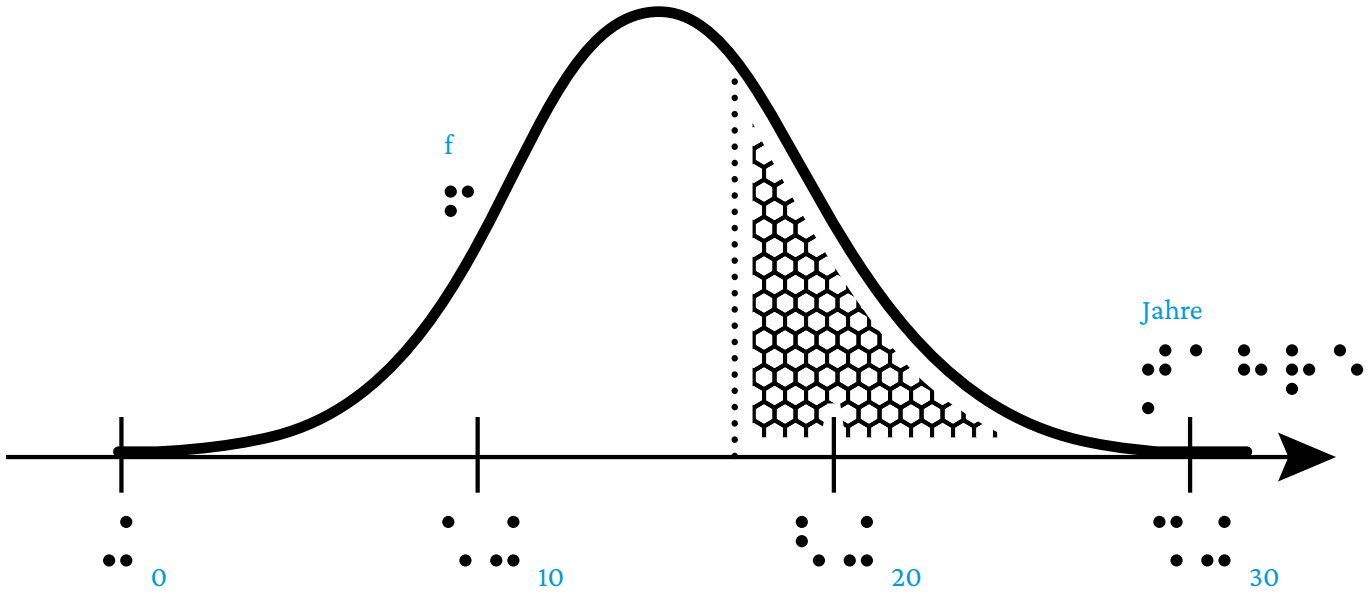
AngMatHAK5

S.47 2.41 b)

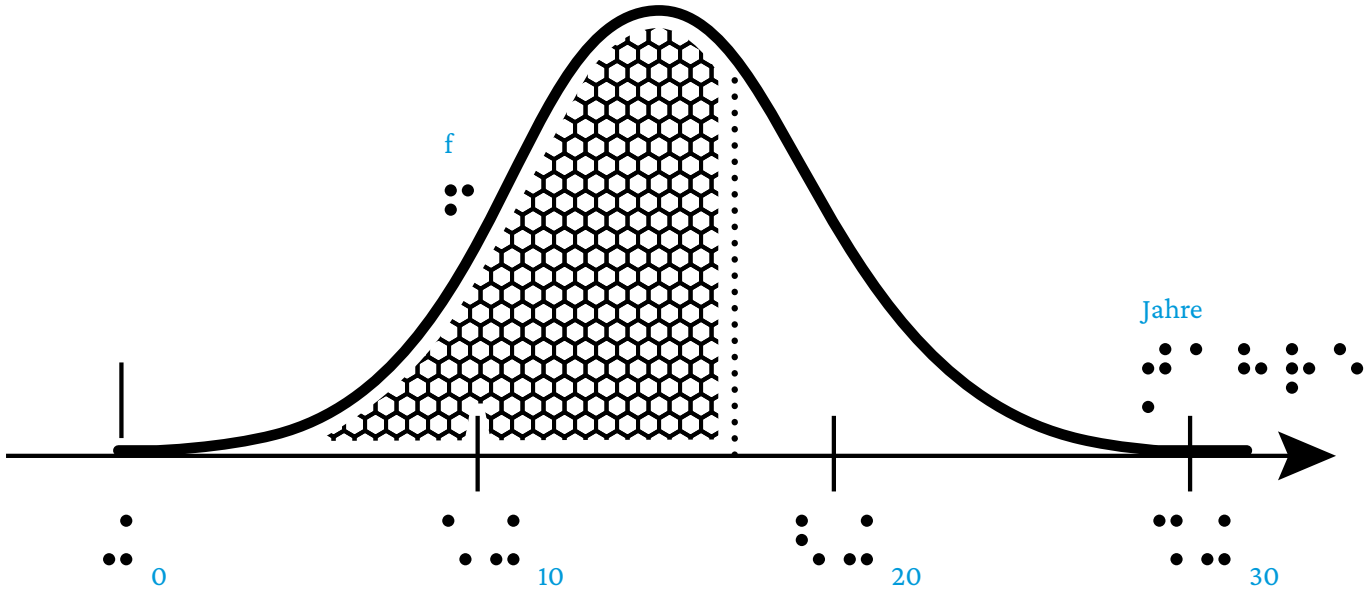



F(x)
1
0,84
0,5
0,16
F
x
0
1
2
3
4
5
6
7
8
9

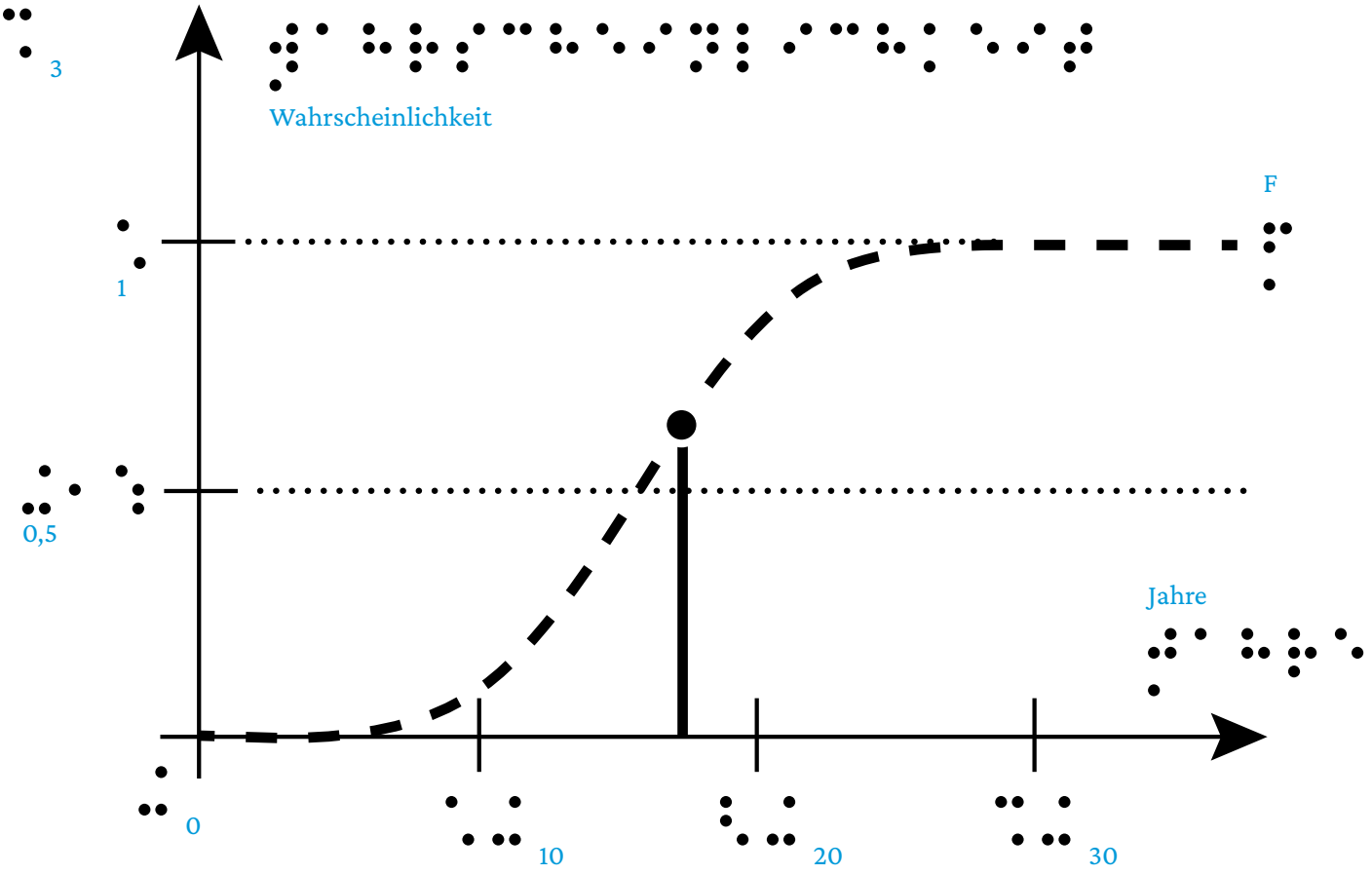
1



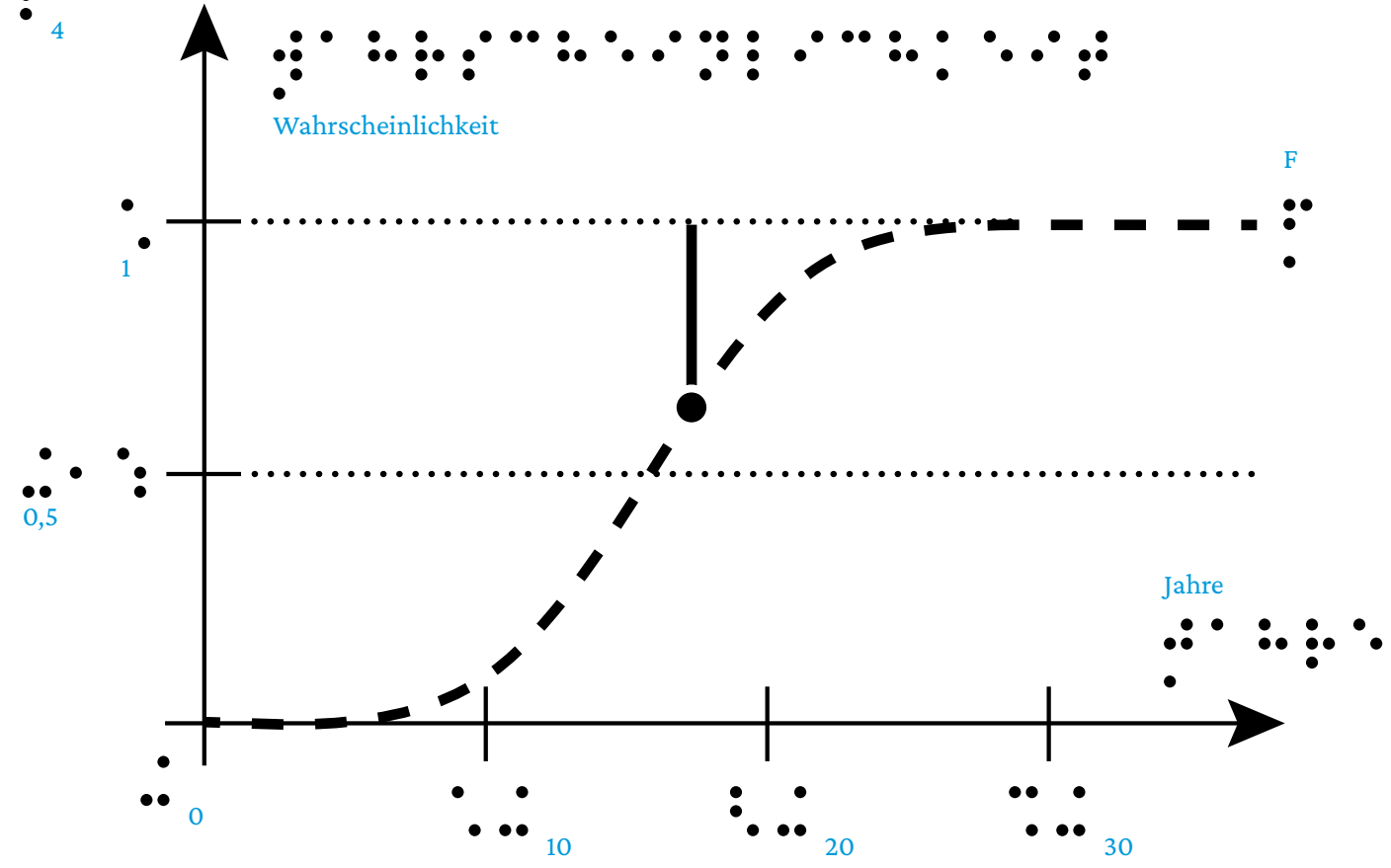
2

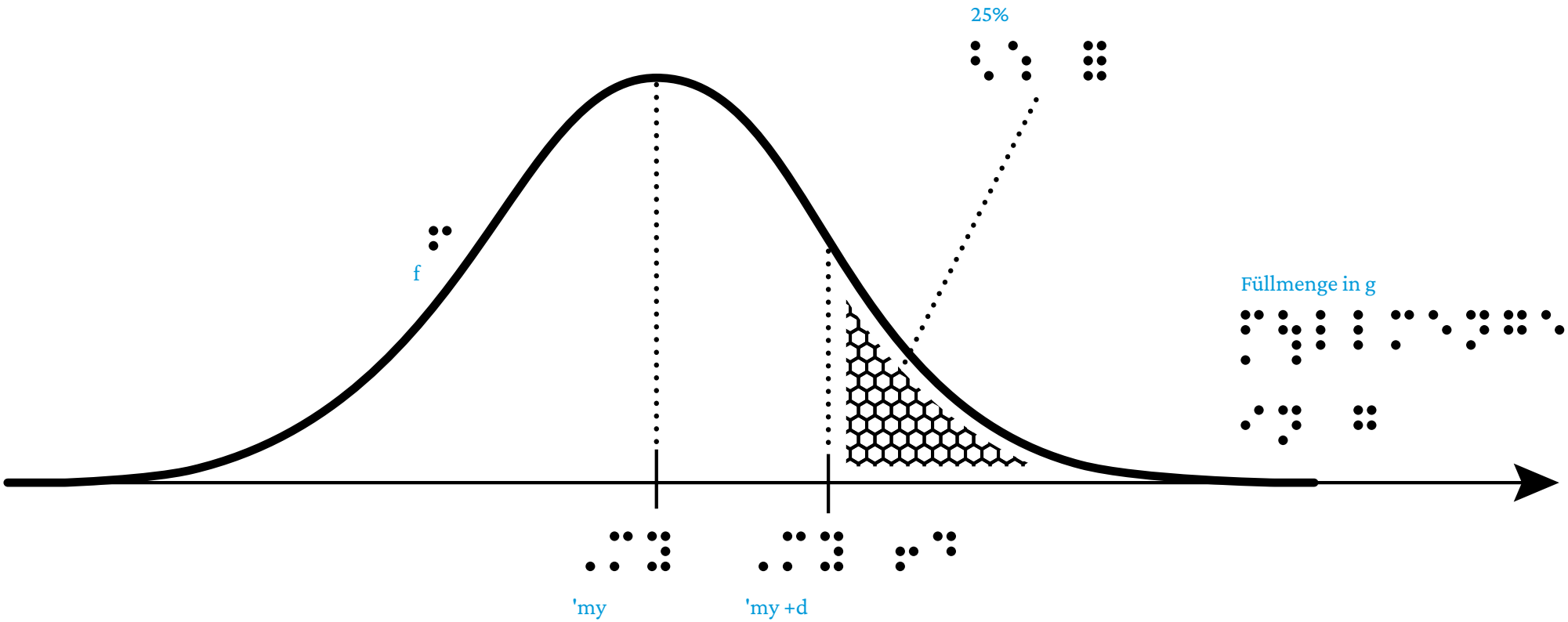


3

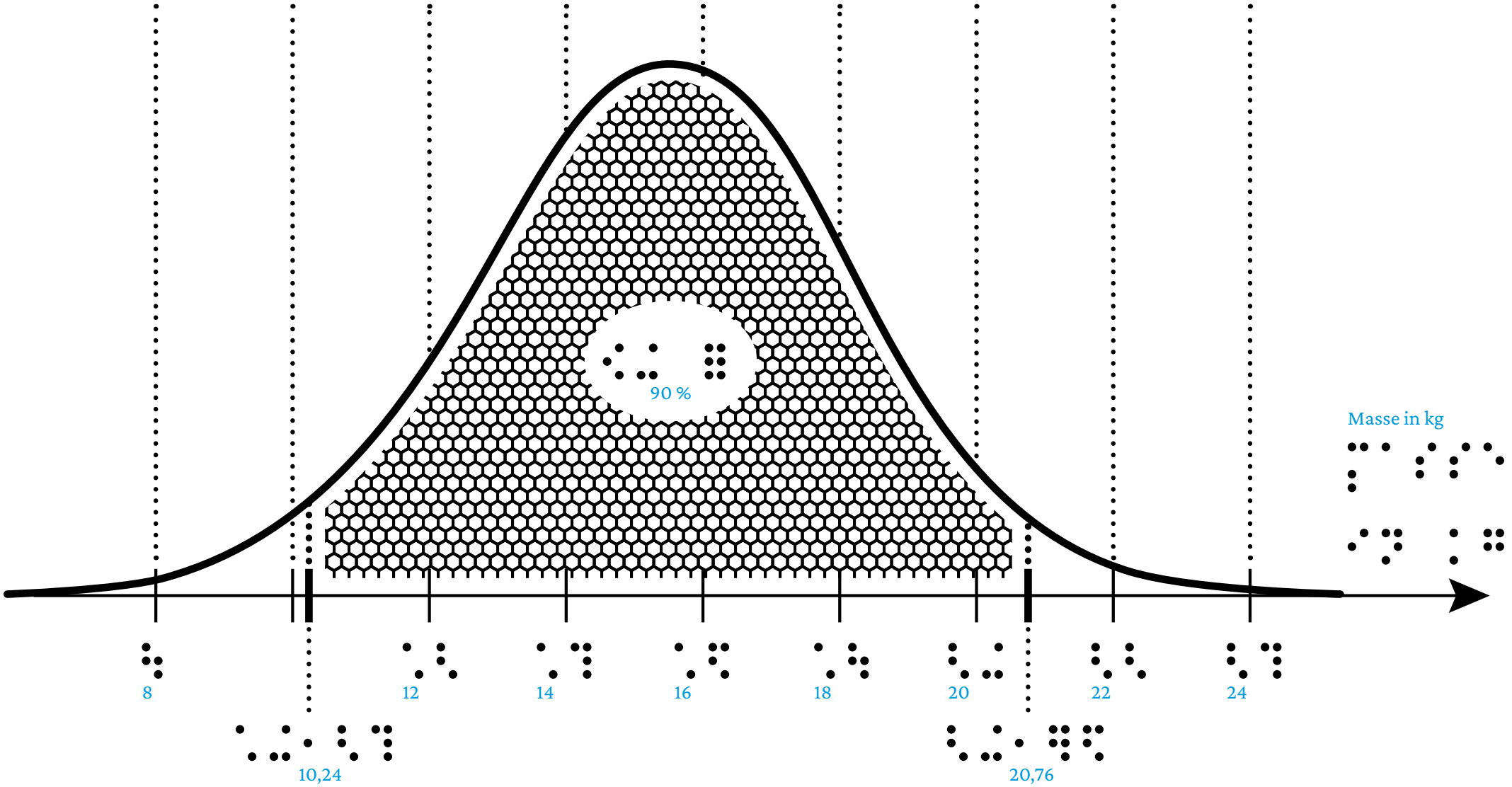

Wahrscheinlichkeit
F
1
0,5
Jahre
0
10
20
30

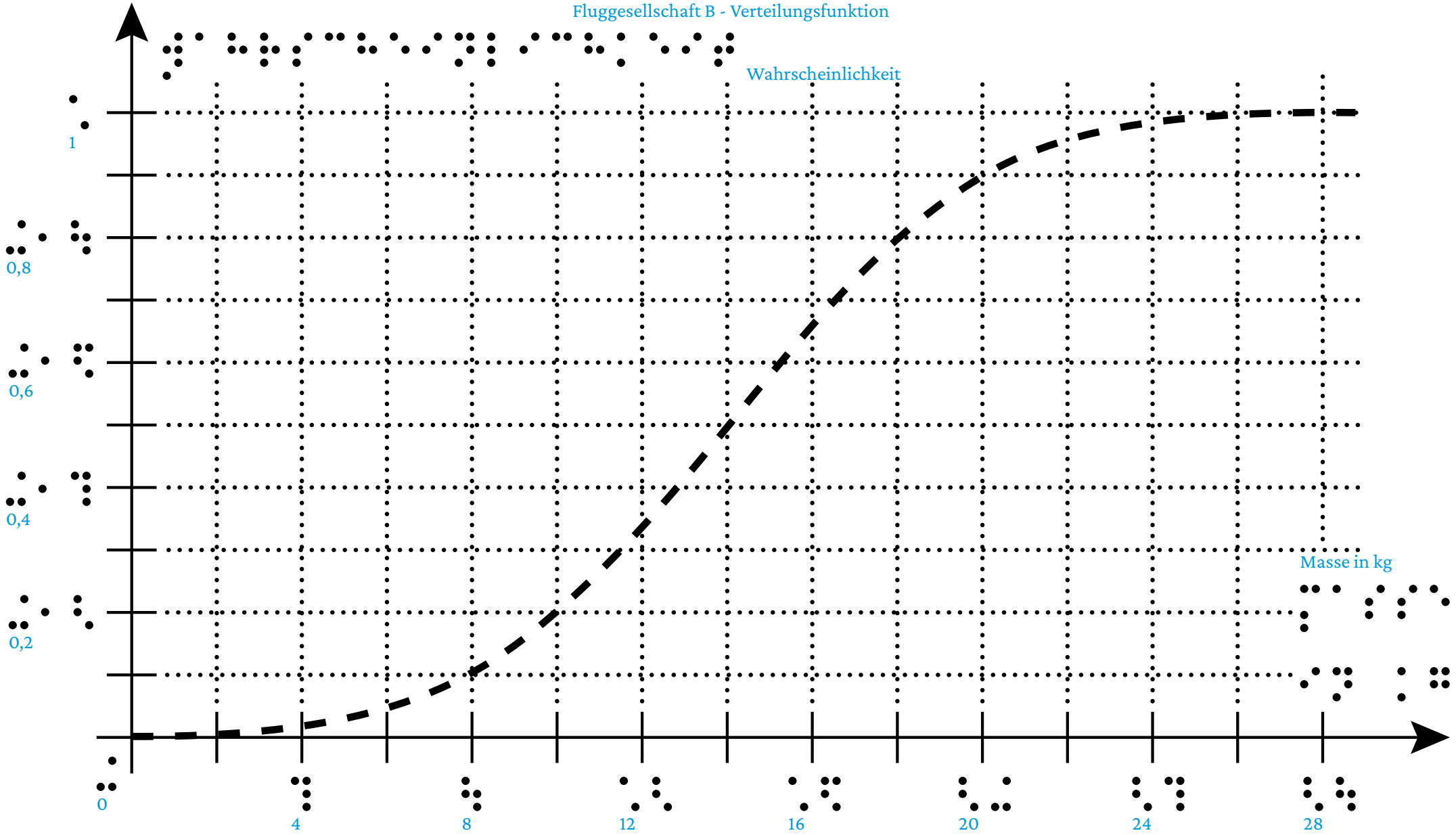
4


Wahrscheinlichkeit
F
1
0,5
Jahre
0
10
20
30

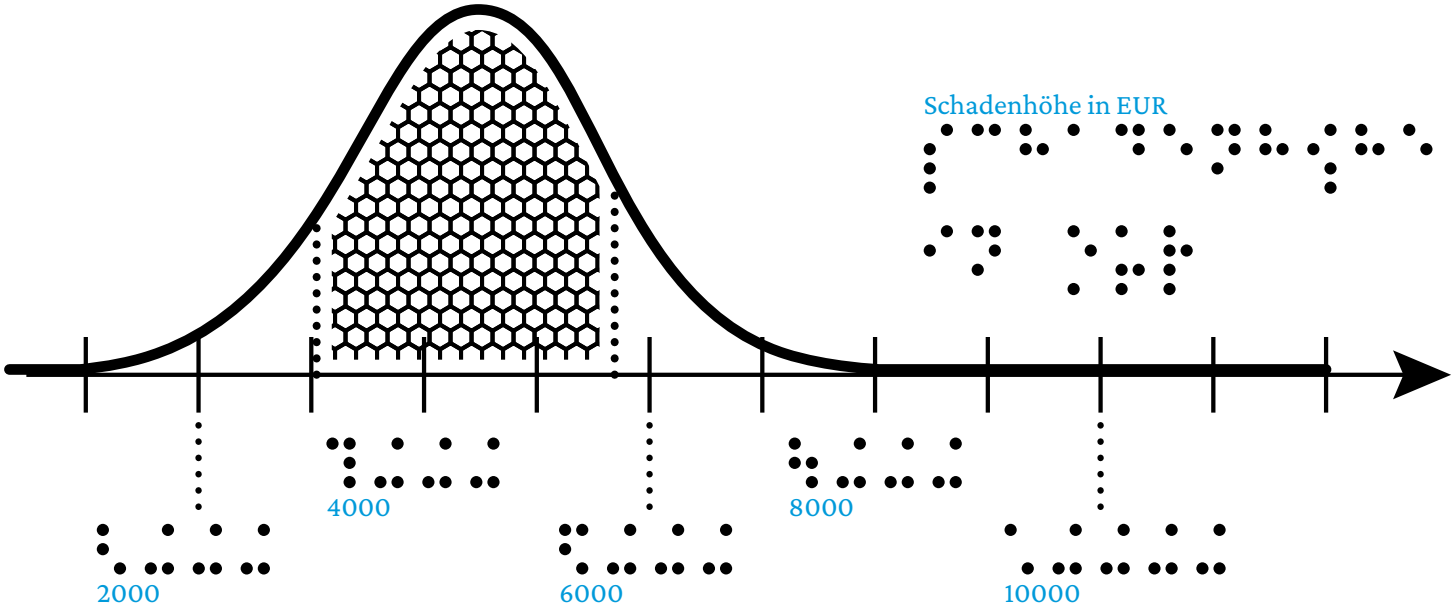

25%
f
Füllmenge in g
'my
'my +d

Fluggesellschaft A - Dichtefunktion

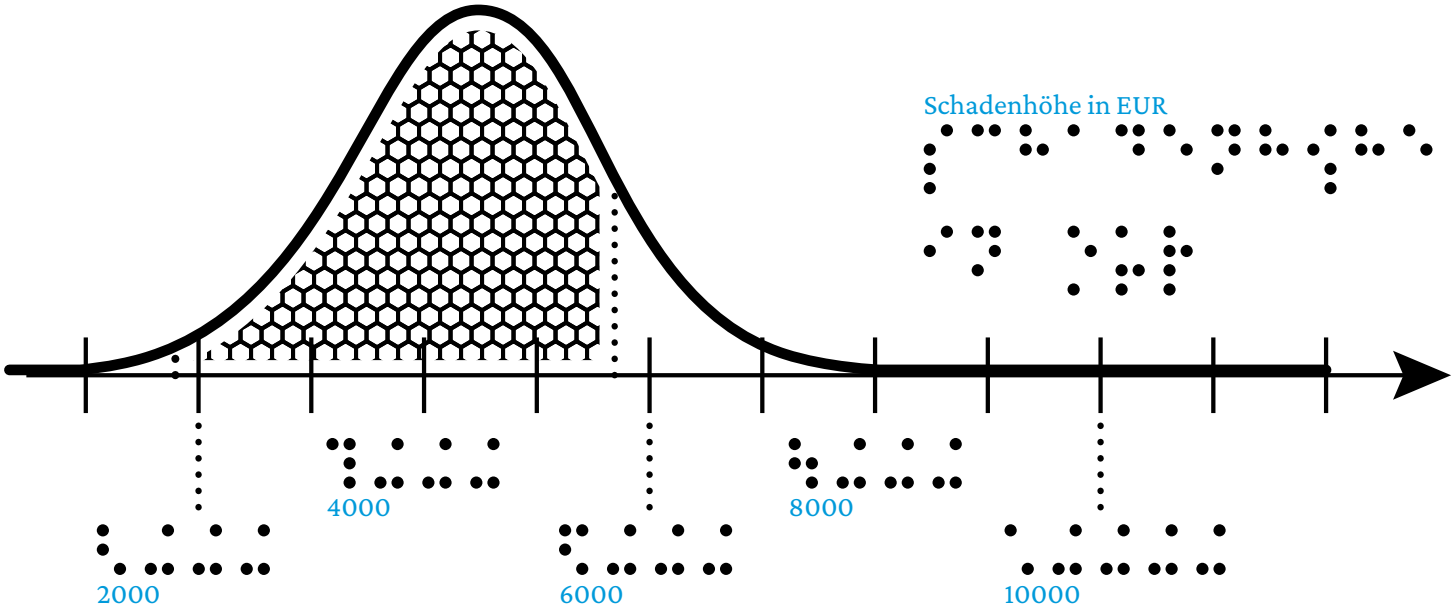



Fluggesellschaft B - Verteilungsfunktion
Wahrscheinlichkeit
1
0,8
0,6
0,4
0,2
0
4
8
12
16
20
24
28
Masse in kg

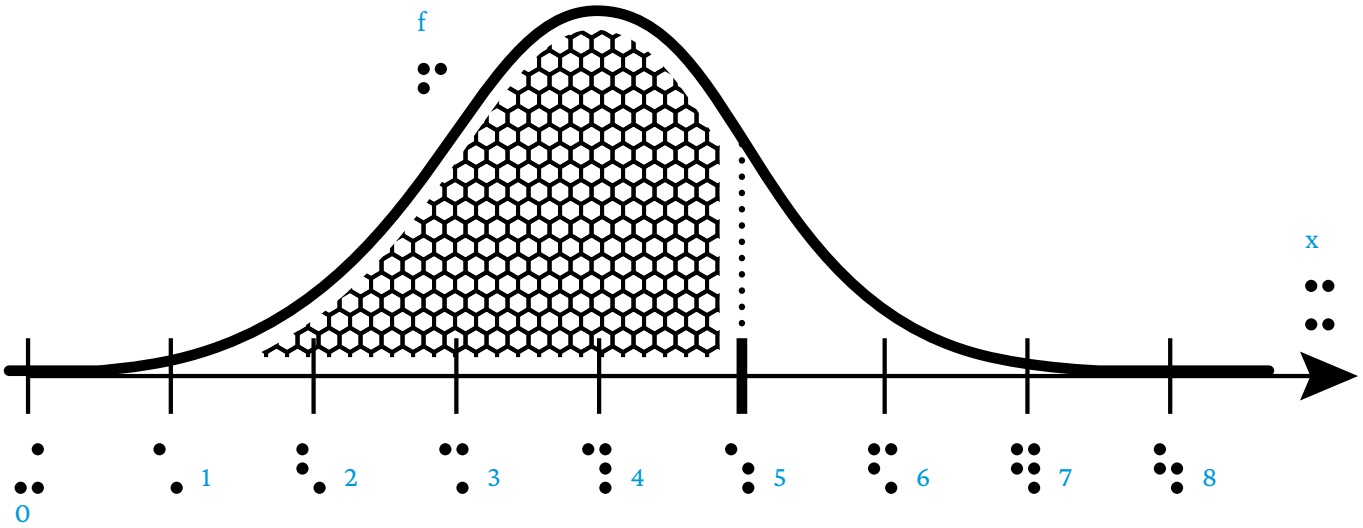
Graph 1



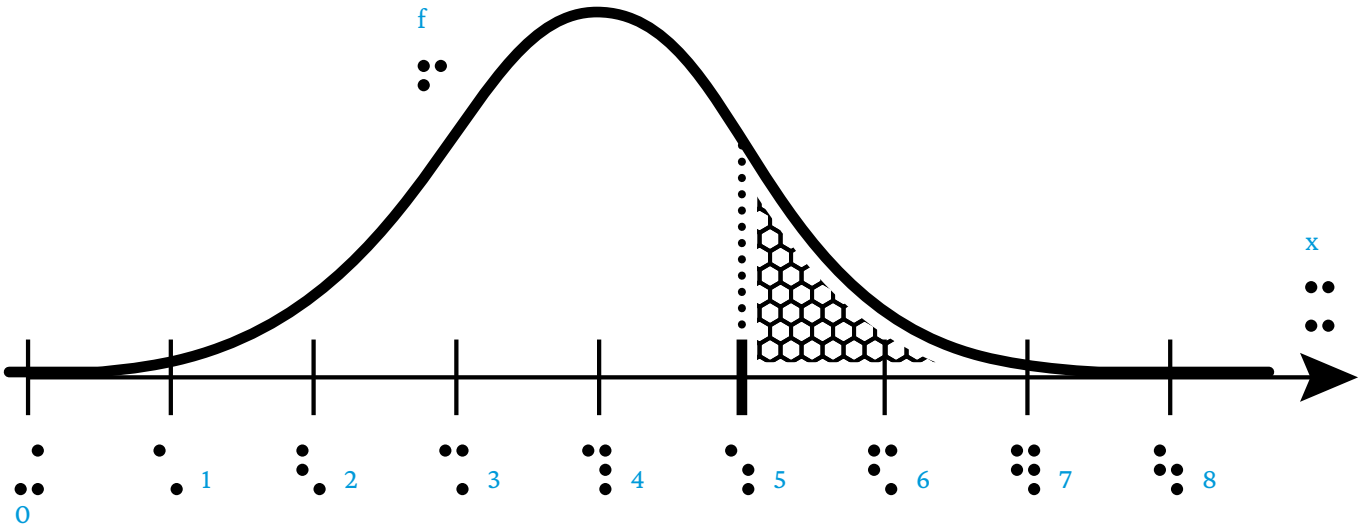
Graph 2



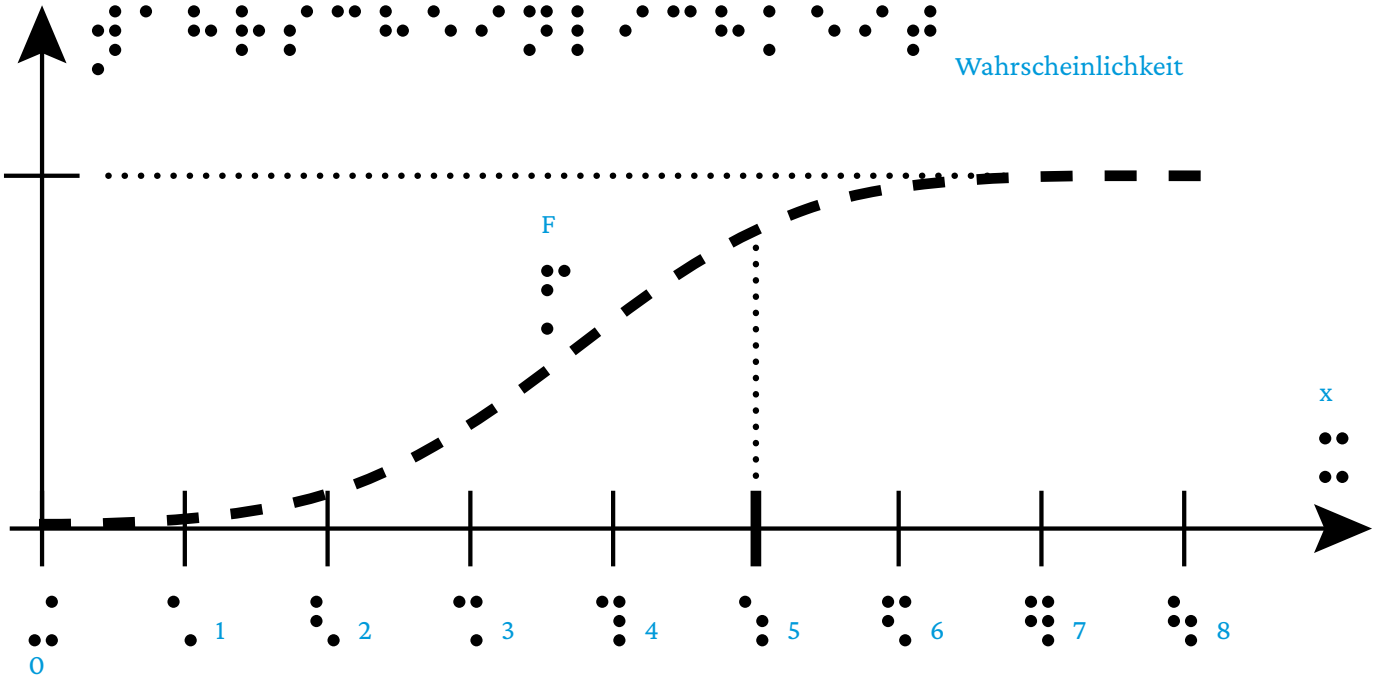
A

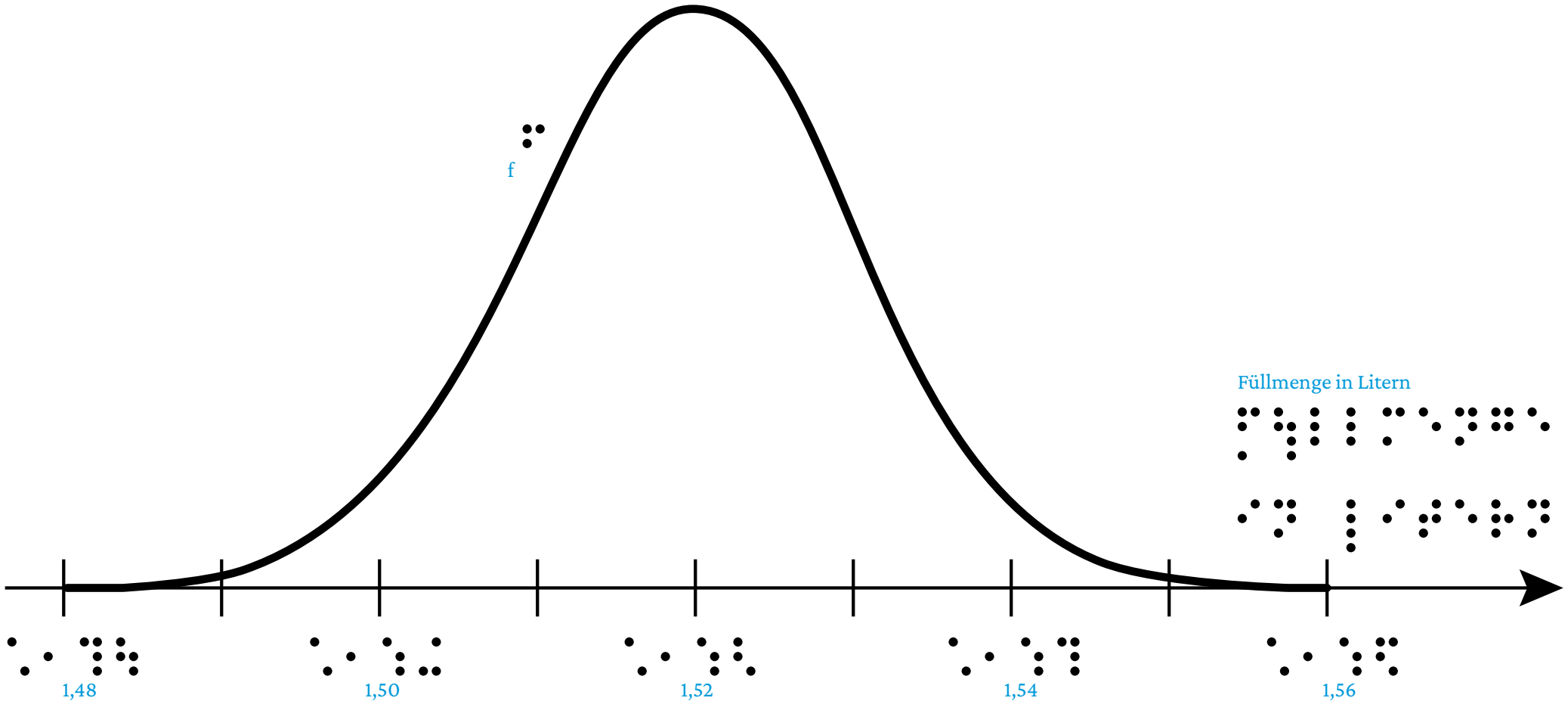

f
x
0
1
2
3
4
5
6
7
8

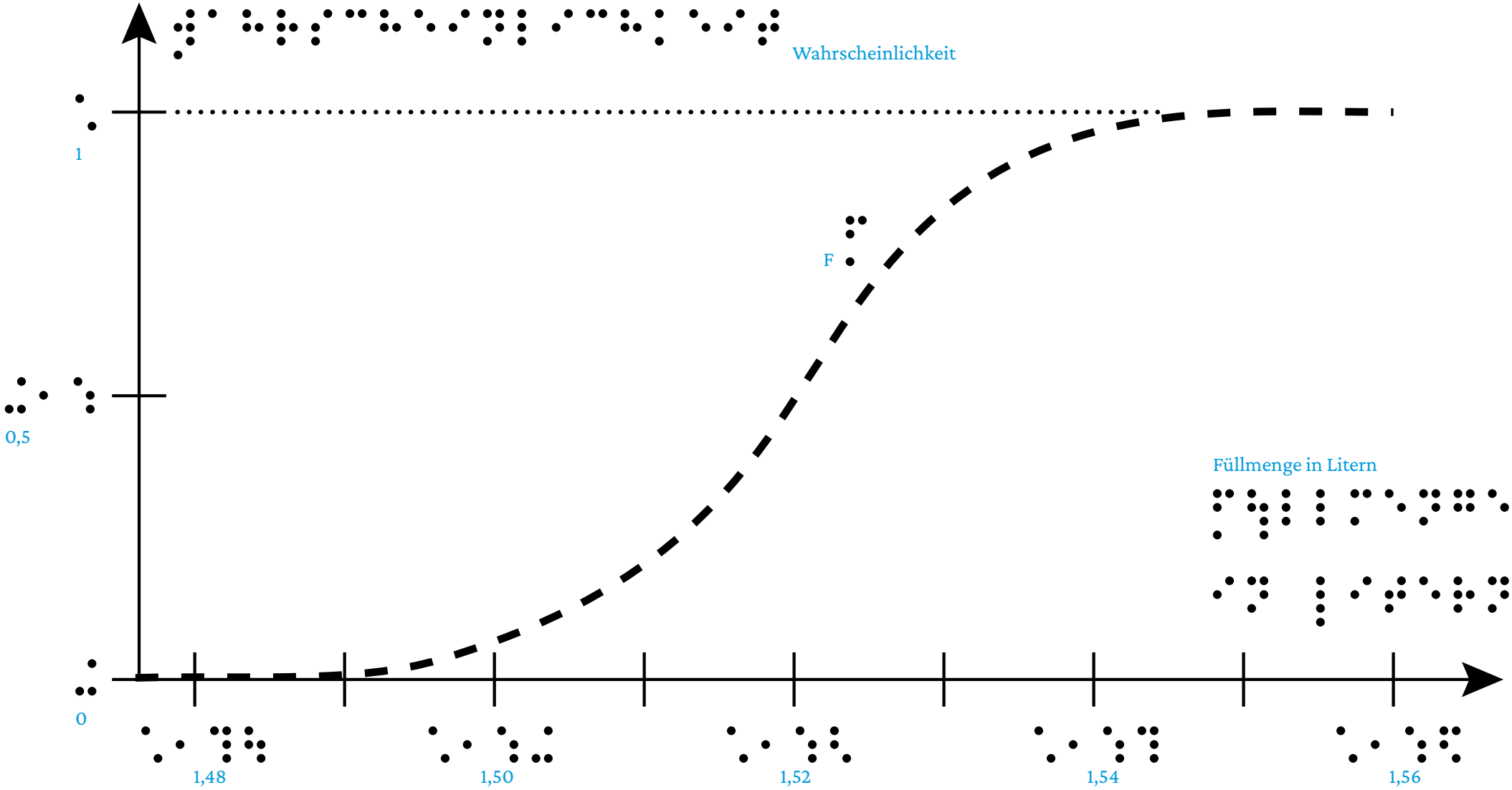
B


f
x
0
1
2
3
4
5
6
7
8

C


Wahrscheinlichkeit
F
x
0
1
2
3
4
5
6
7
8

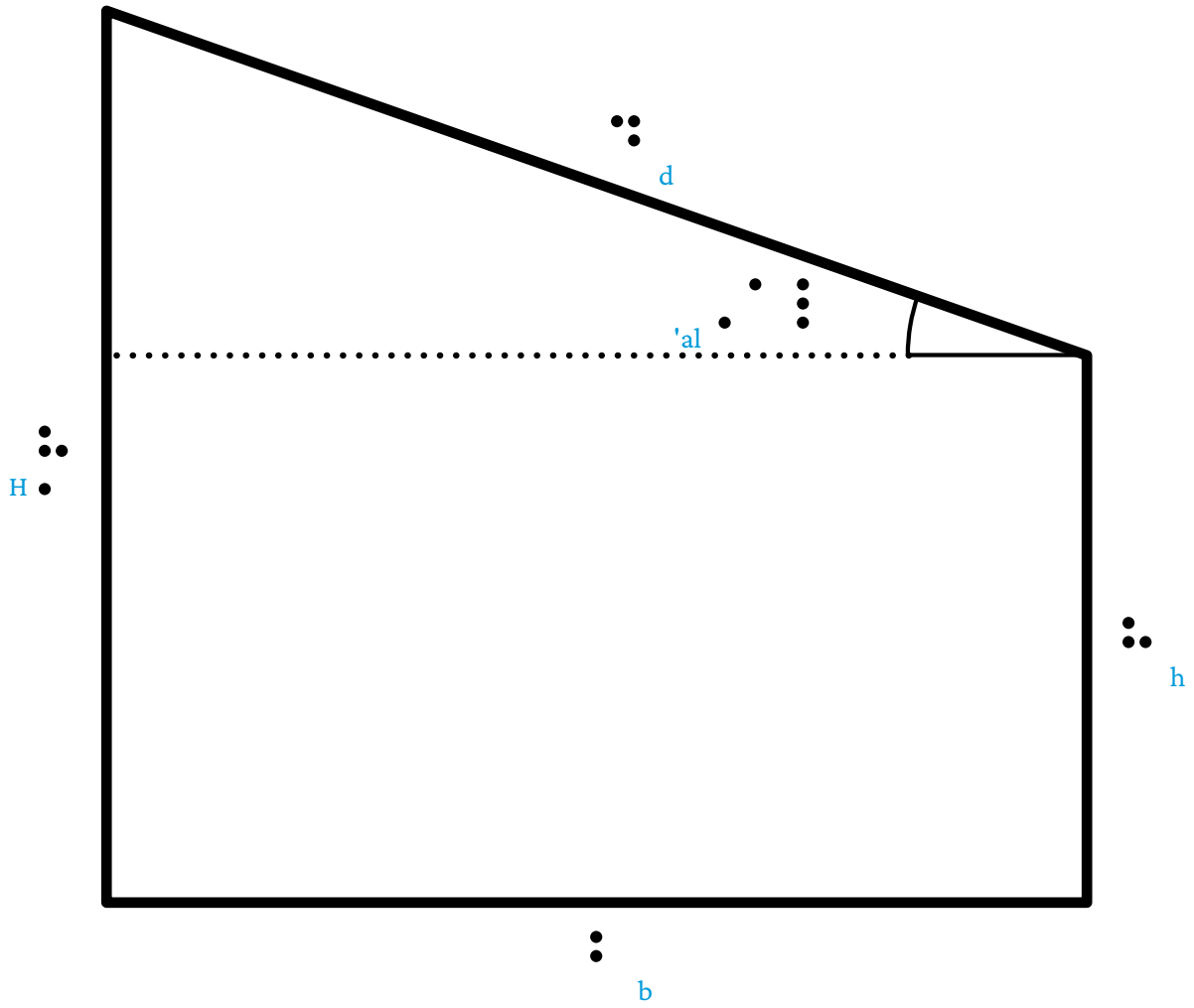

f
Füllmenge in Litern
1,48
1,50
1,52
1,54
1,56

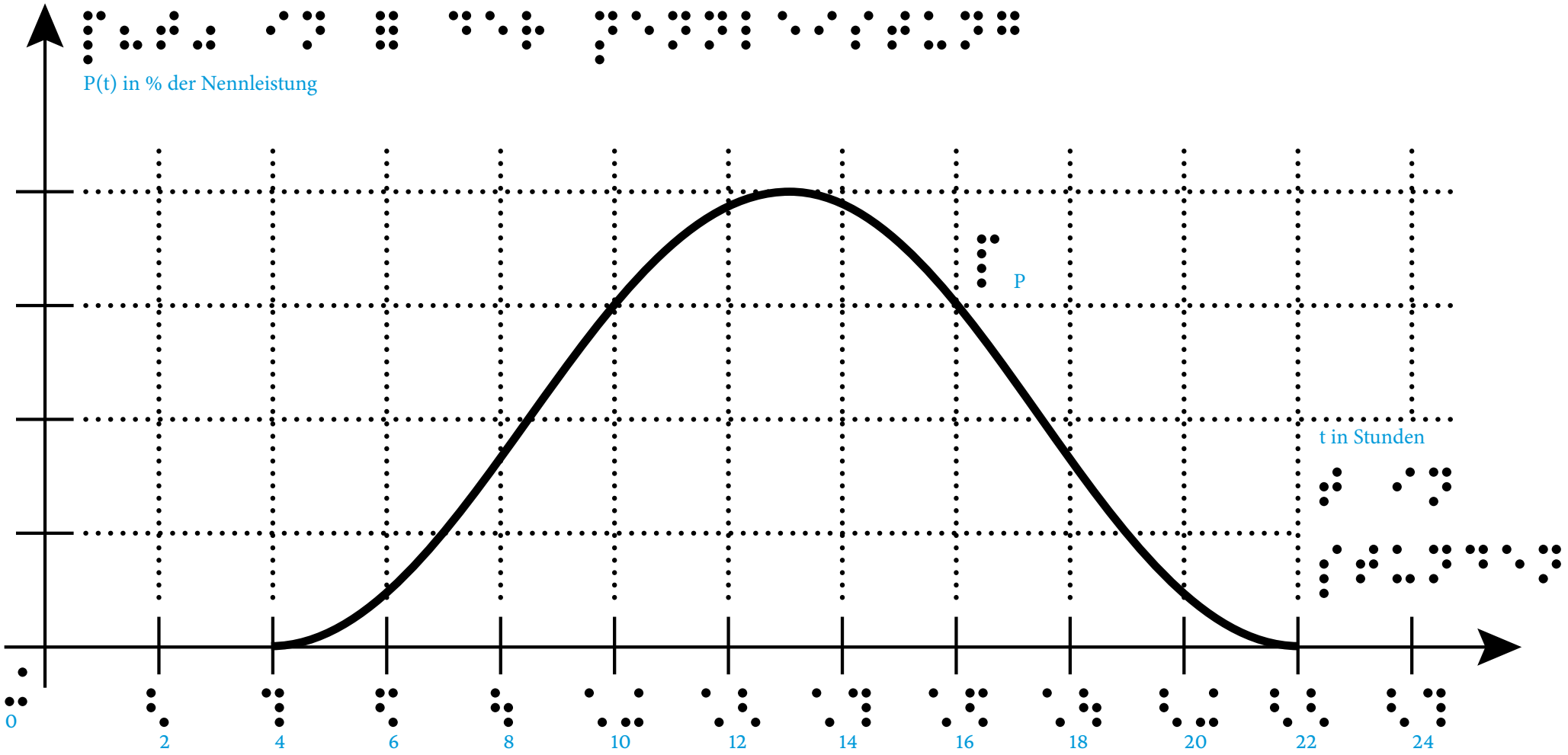

Wahrscheinlichkeit
1
F
0,5
Füllmenge in Litern
0
1,48
1,50
1,52
1,54
1,56

Angewandte Mathematik
HAK Band 5

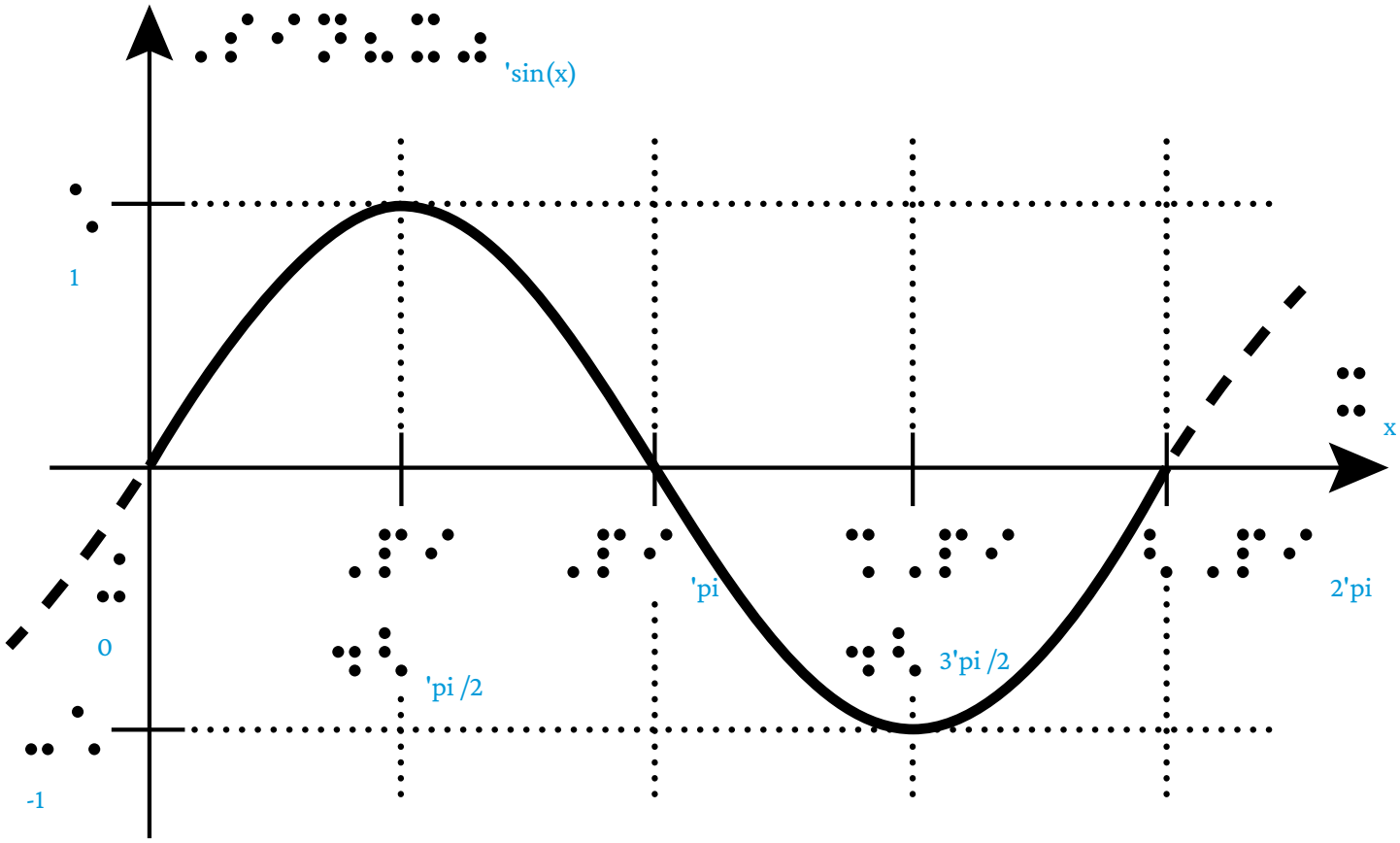
3.

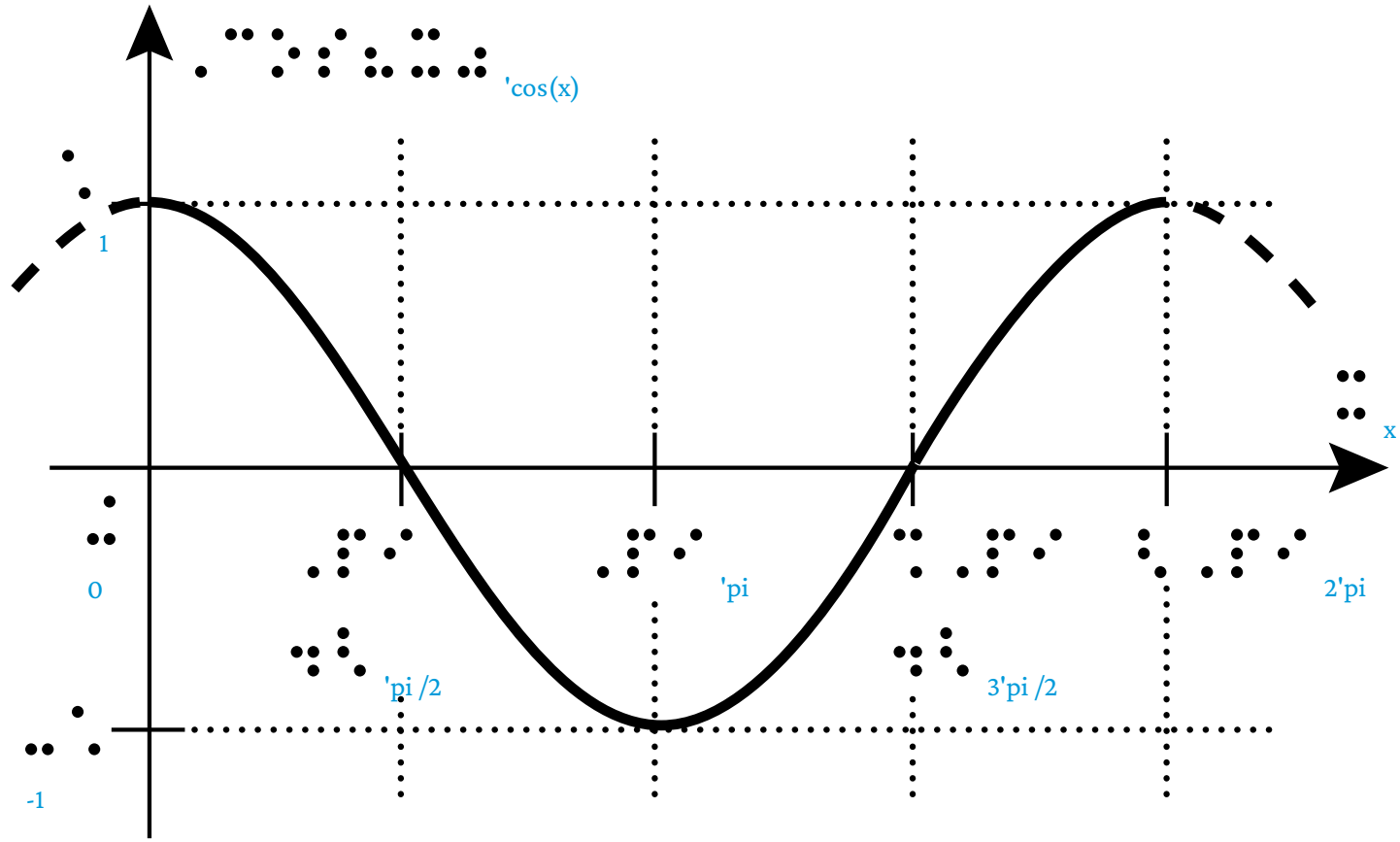
Vorbereitung auf die SRDP


d
'al
H
h
b

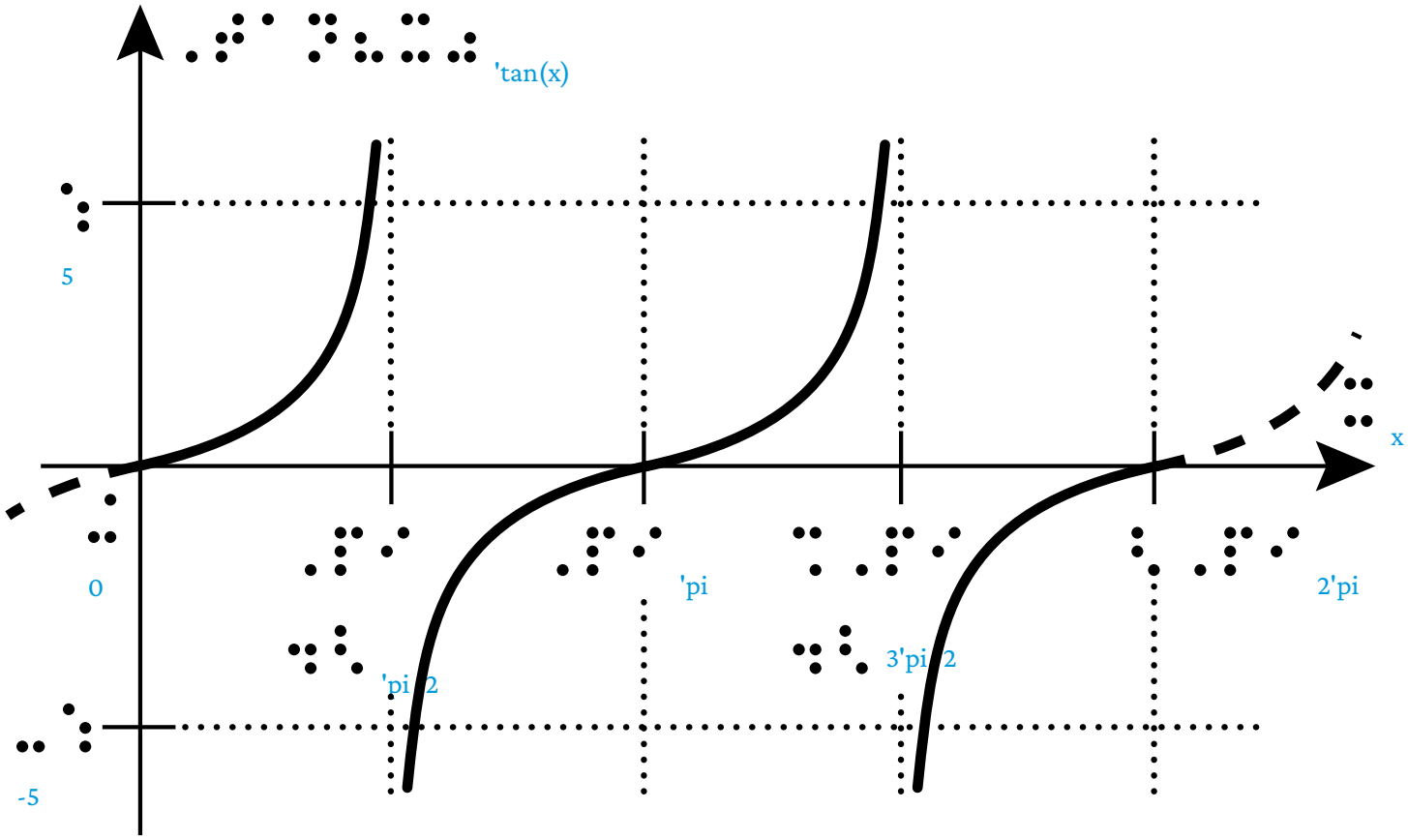

P(t) in % der Nennleistung
P
t in Stunden
0
2
4
6
8
10
12
14
16
18
20
22
24

S.81 WH06 Hinweis zu e) 1/2

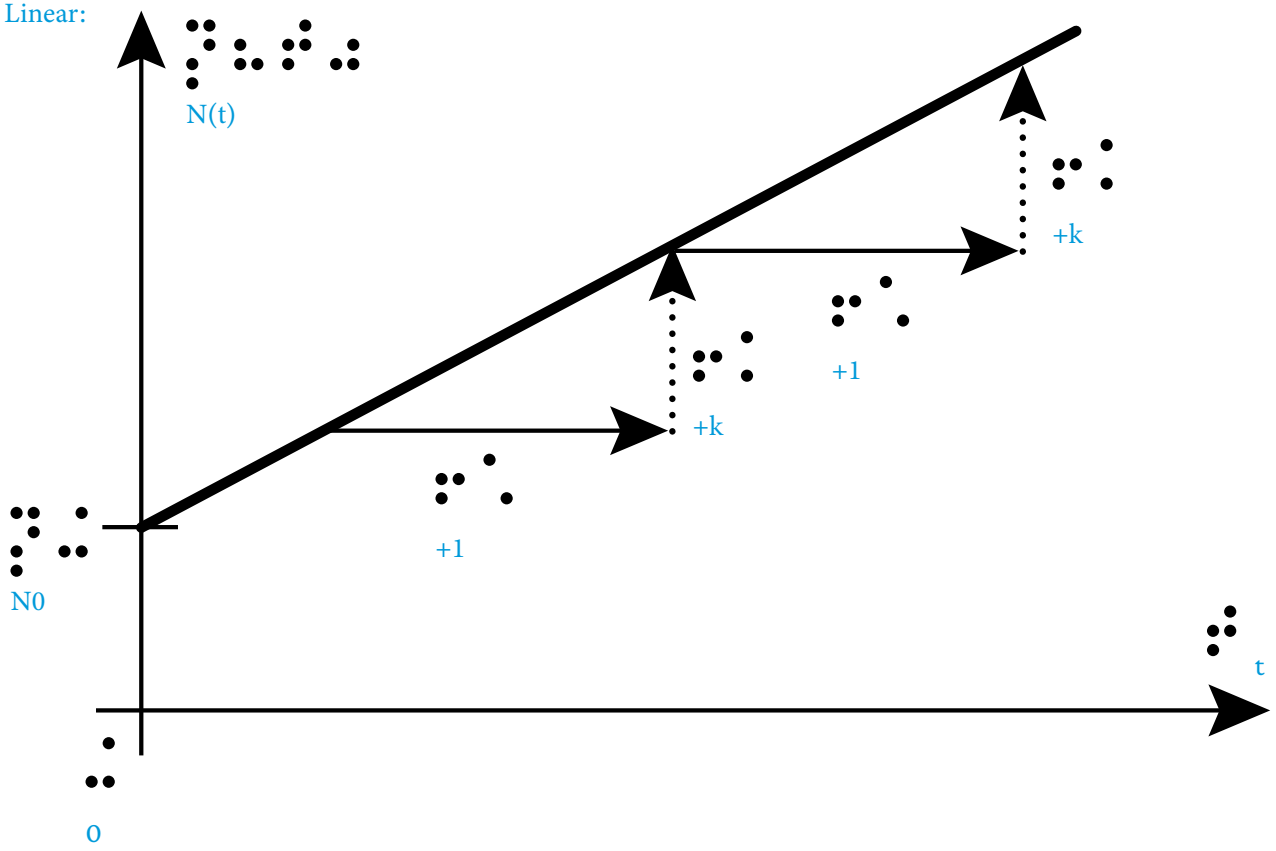




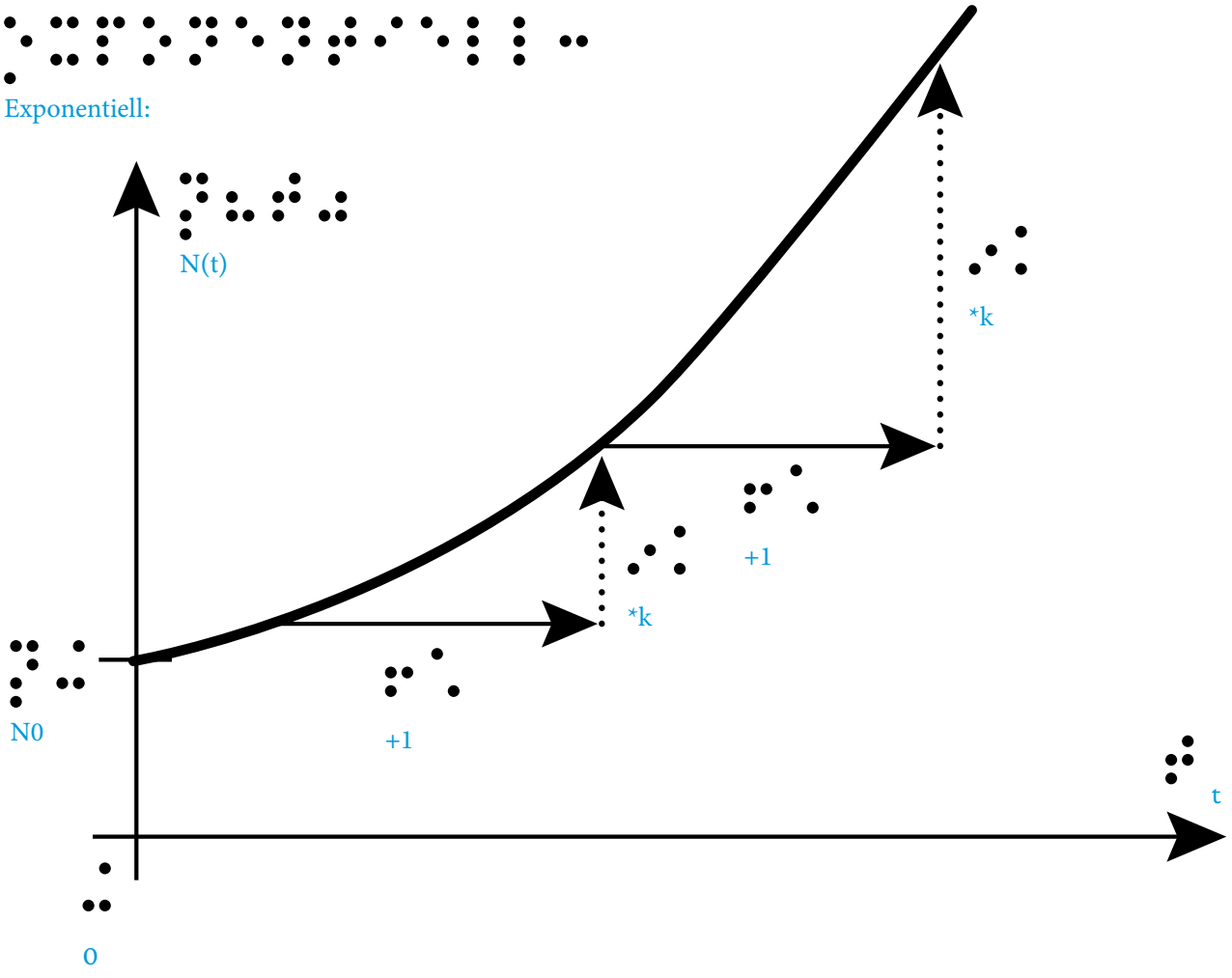
S.81 WH06 Hinweis zu e) 2/2

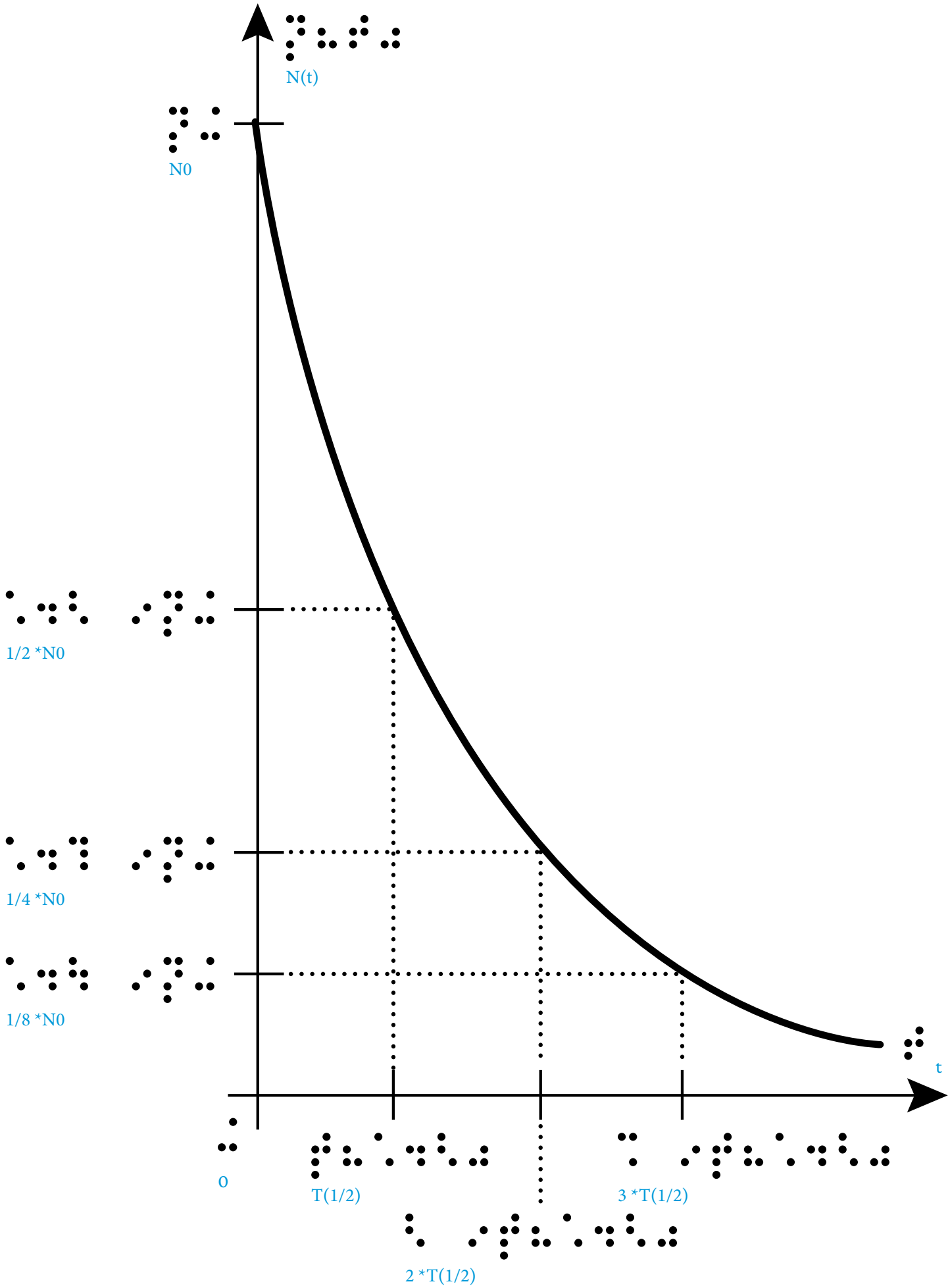


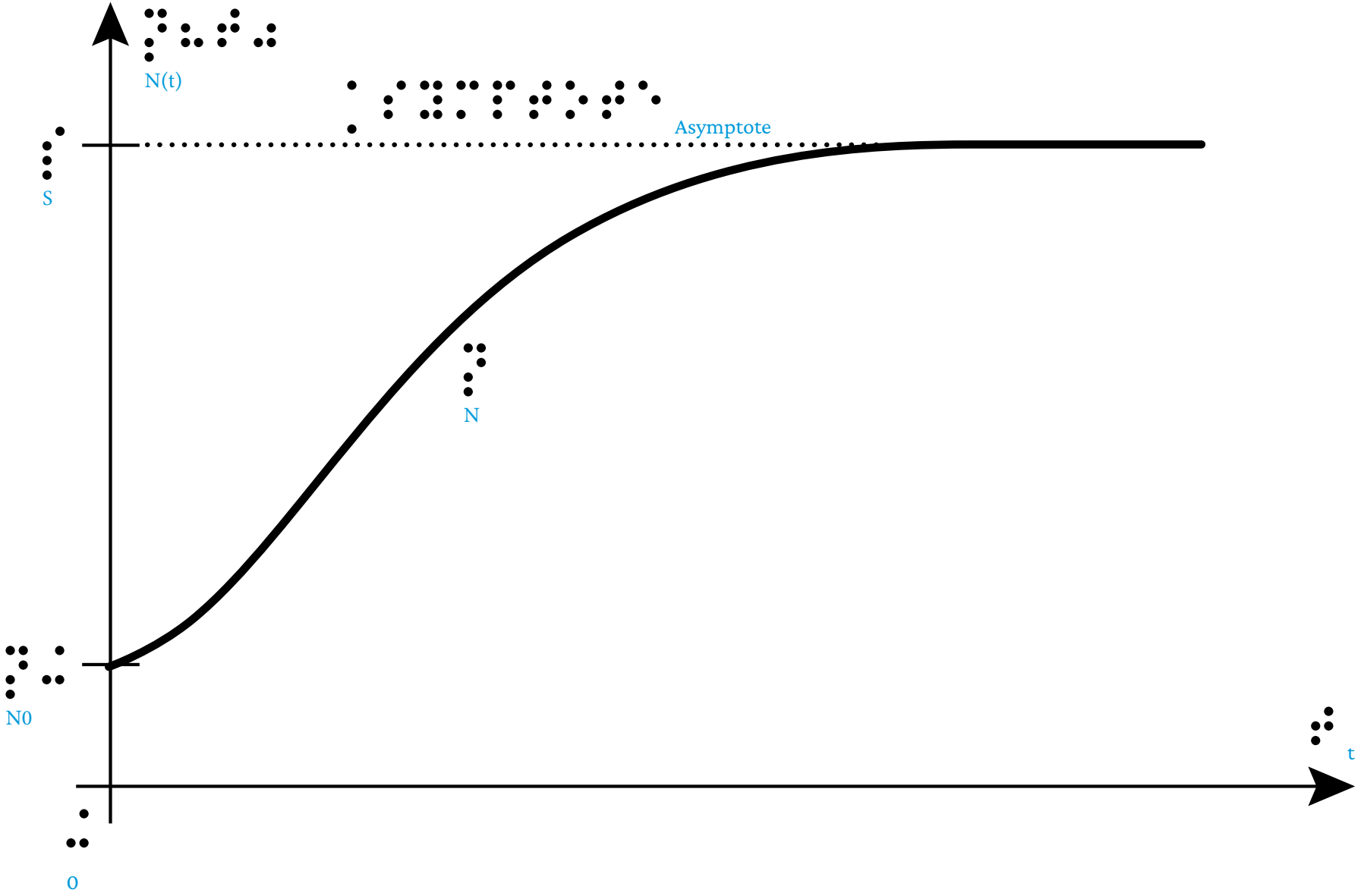
Linear:



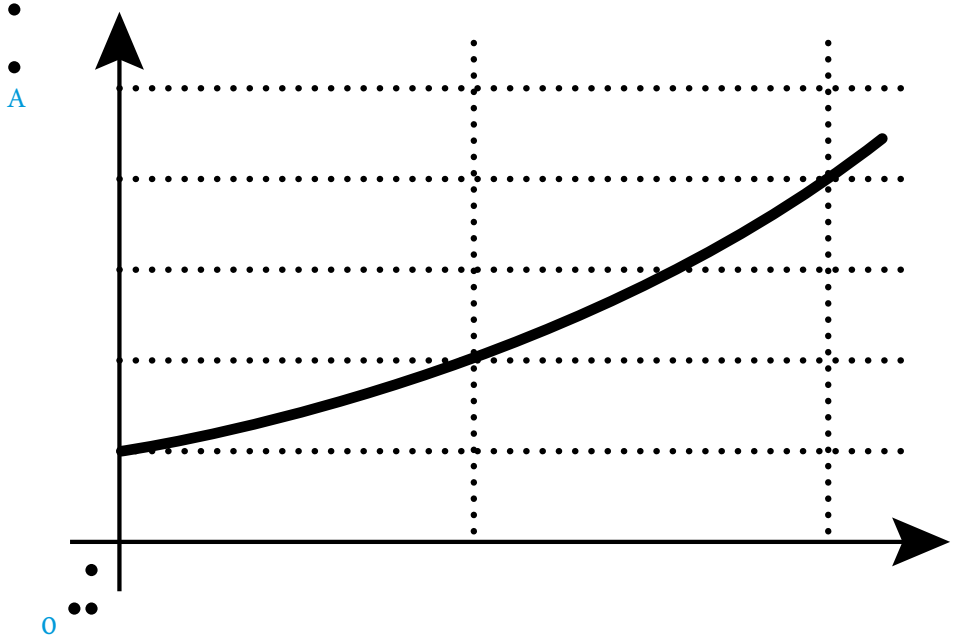
Exponentiell:



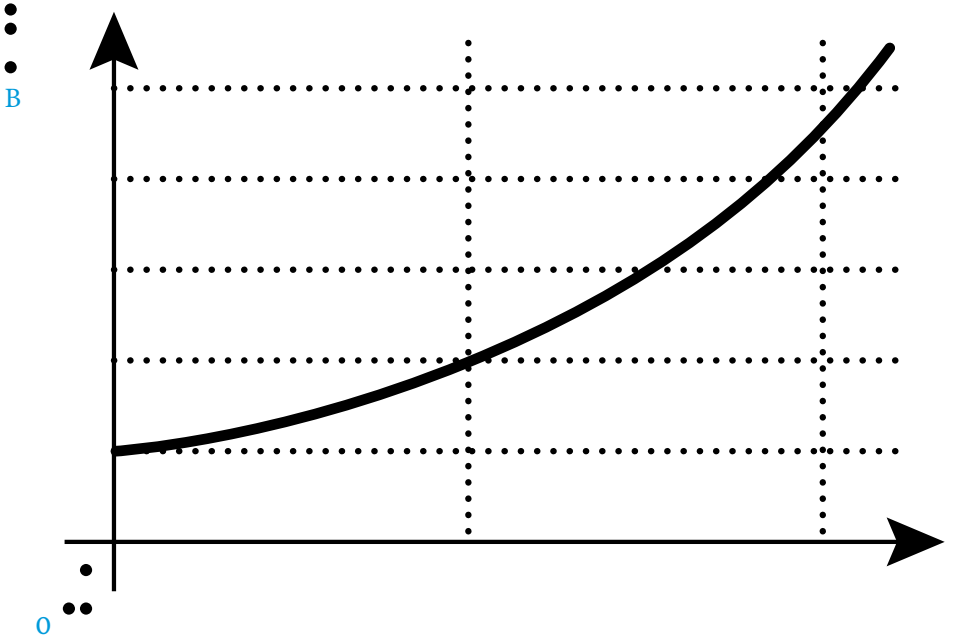

N(t)
N0
1/2 *N0
1/4 *N0
1/8 *N0
t
0
T(1/2)
2 *T(1/2)
3 *T(1/2)


N(t)
Asymptote
S
N
N0
t
0

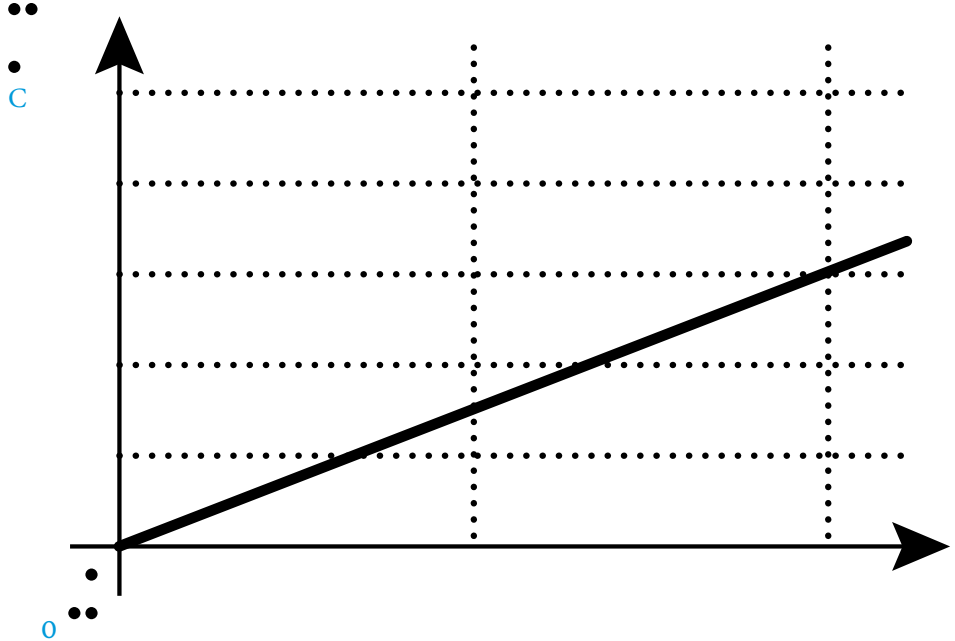
A



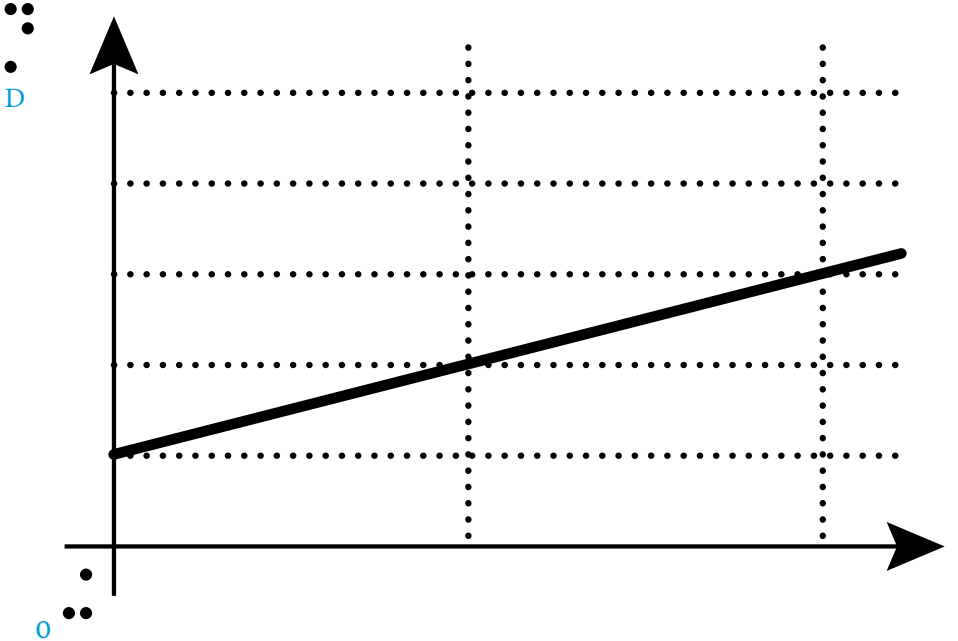
B

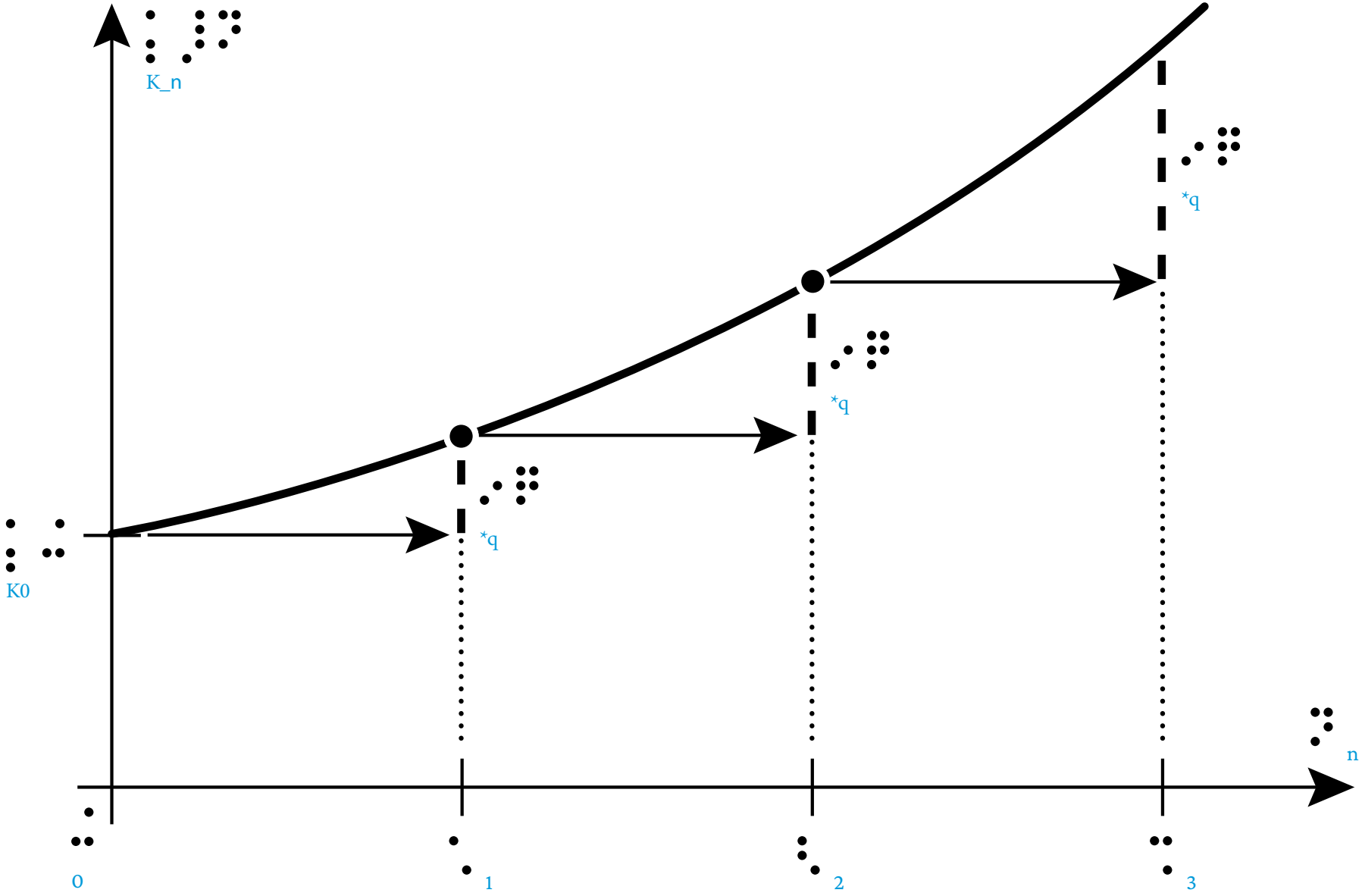


C

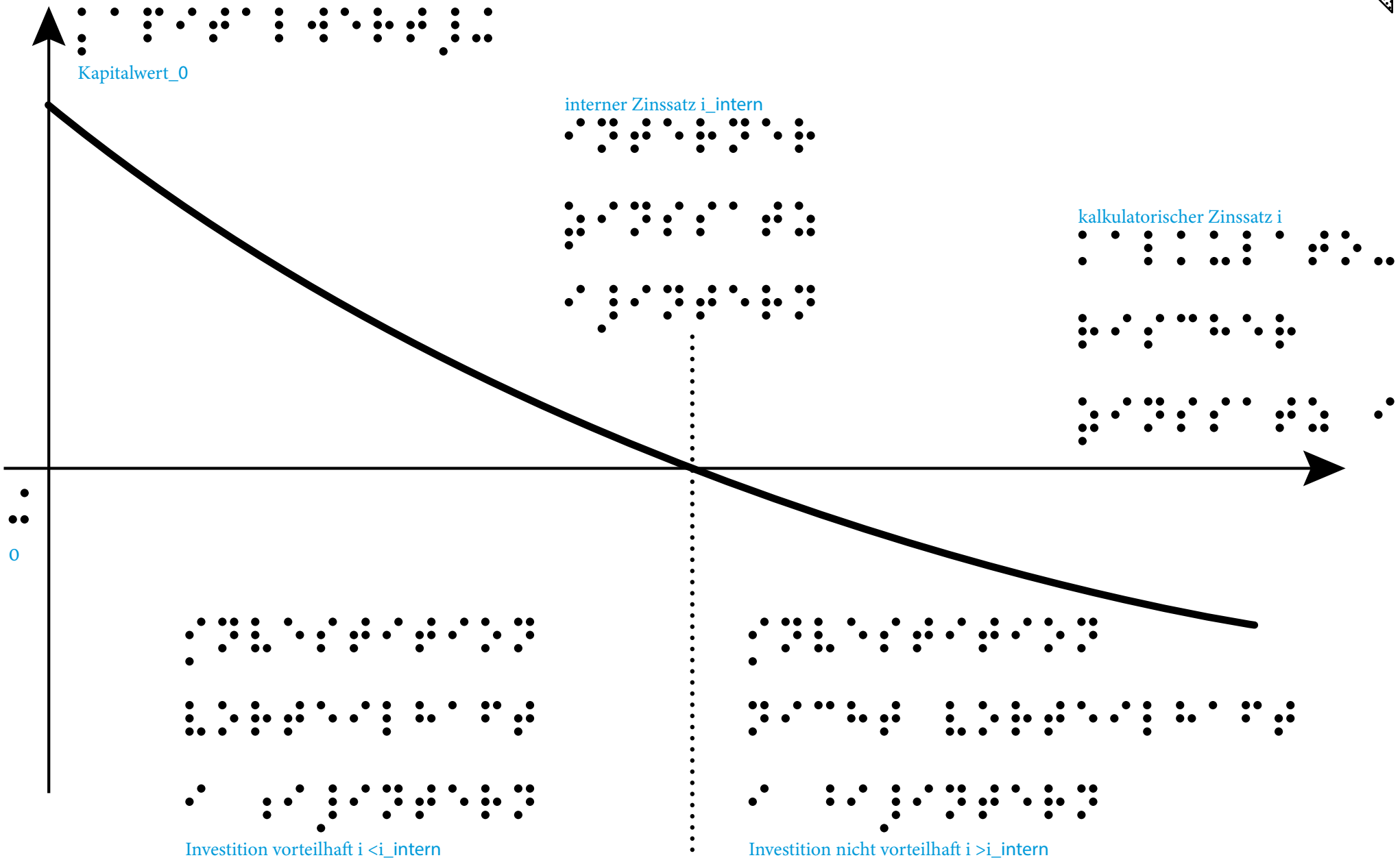


D




K_n
*q
*q
*q
K0
n
0
1
2
3

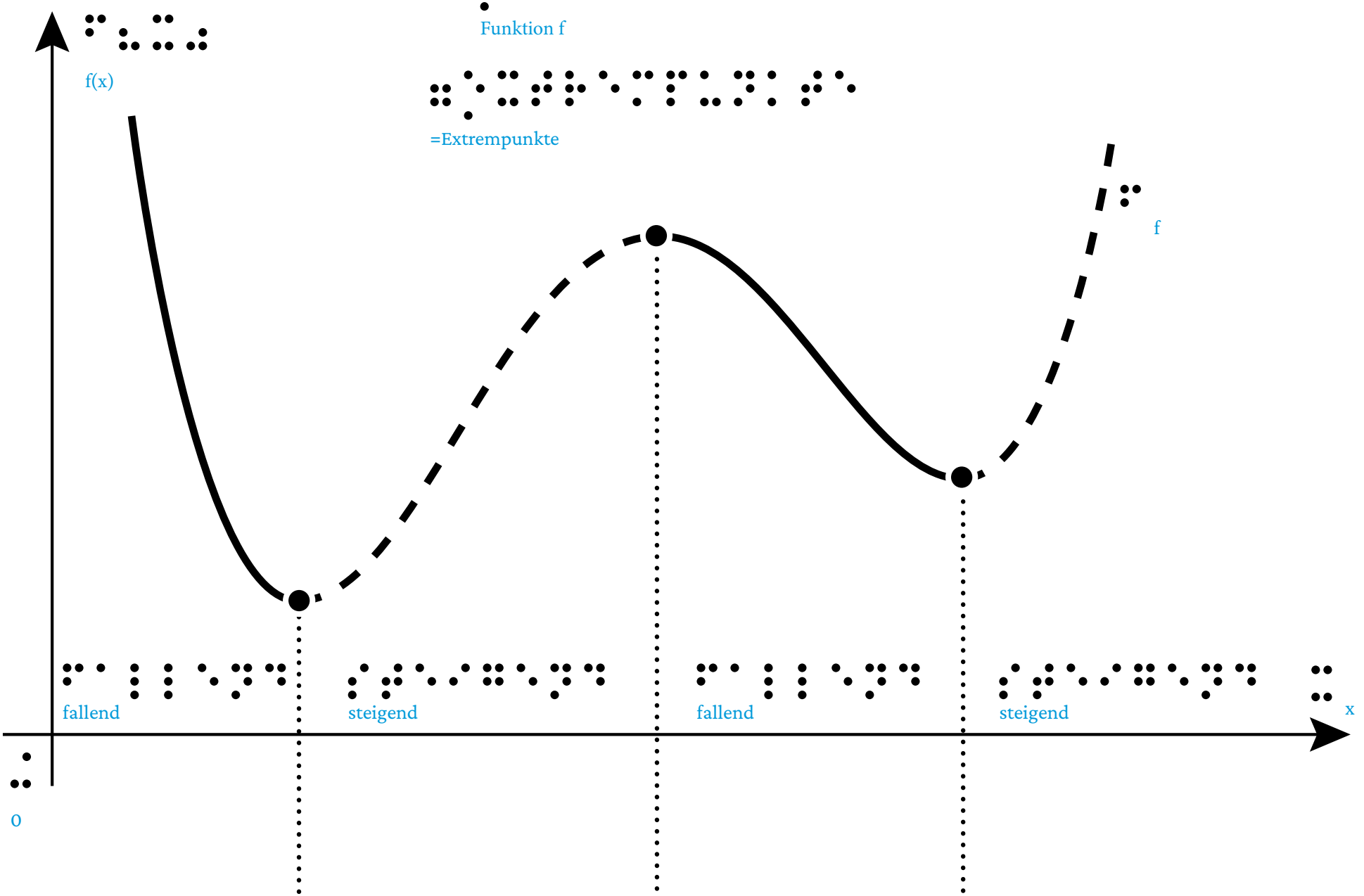
S.91 WH11 Hinweis zu c)



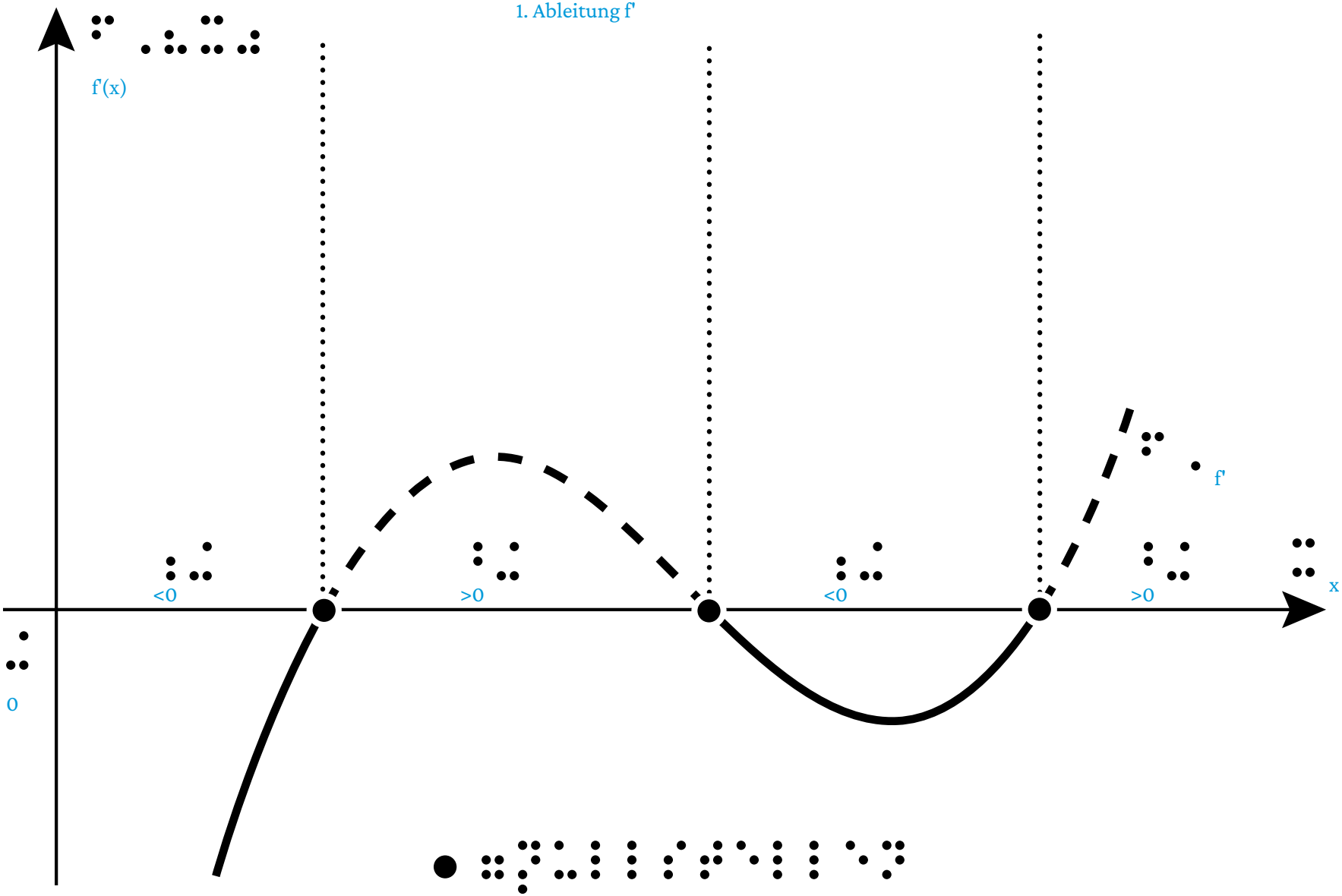
Funktion f

f(x)

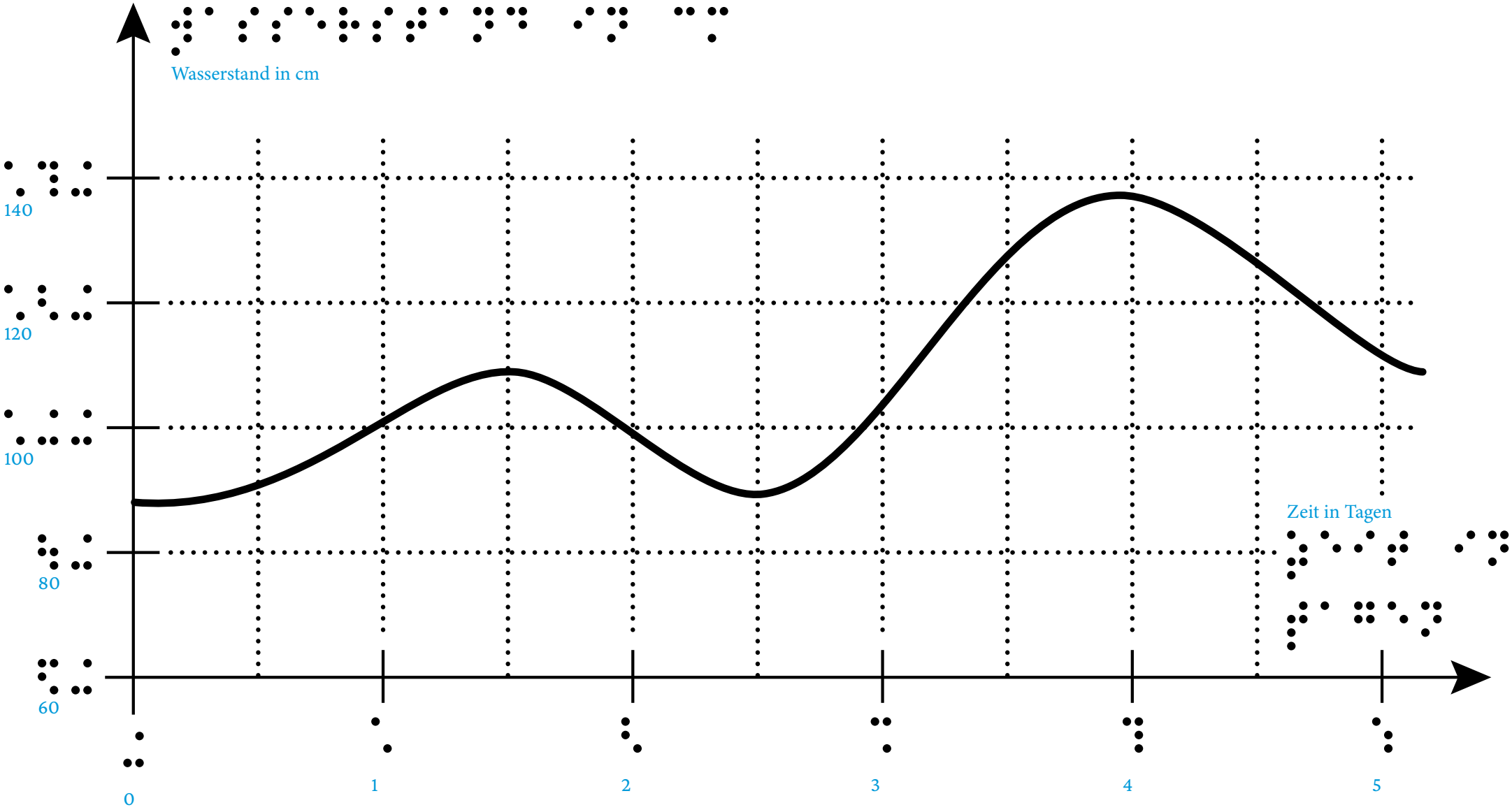
=Extrempunkte

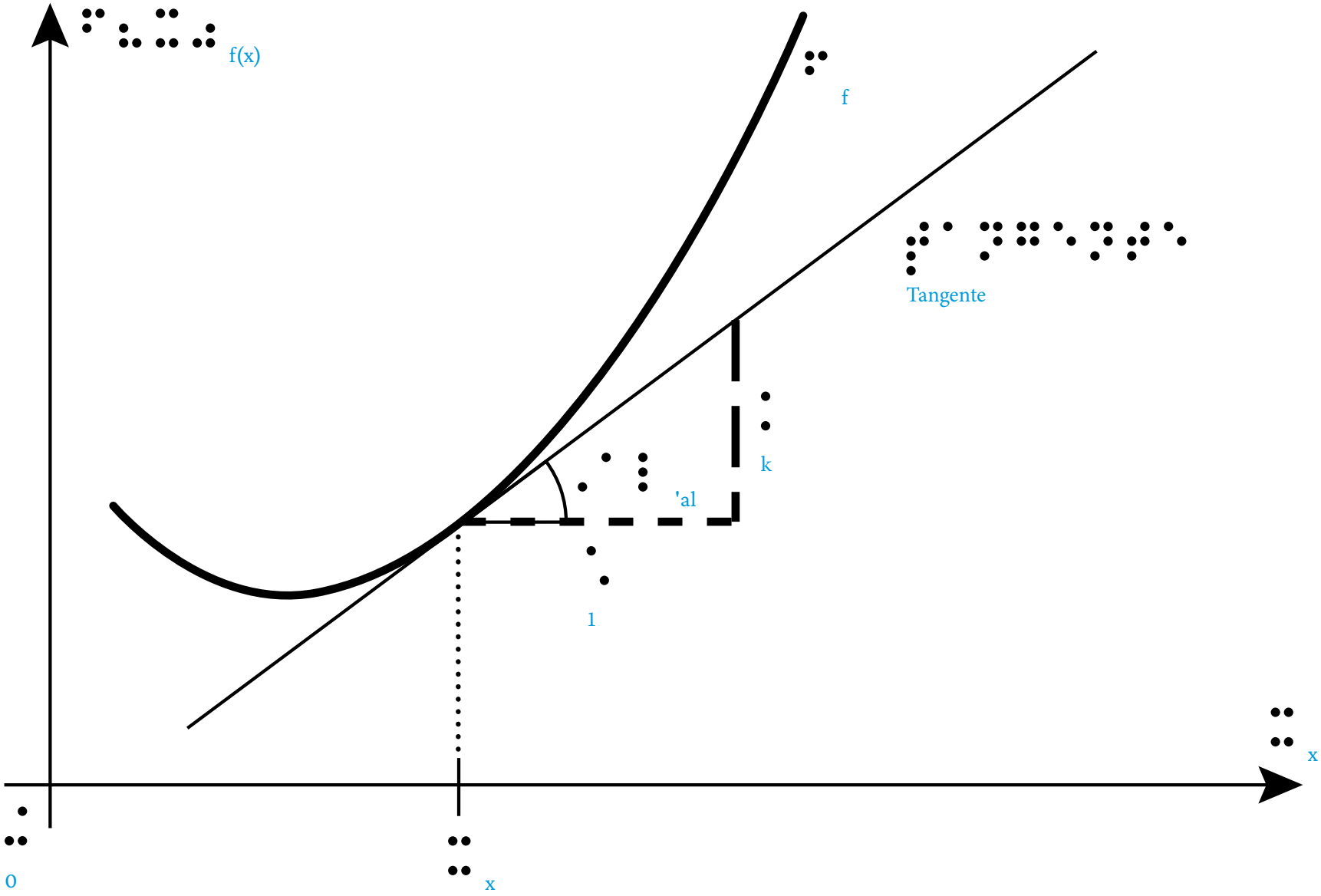


1. Ableitung f'

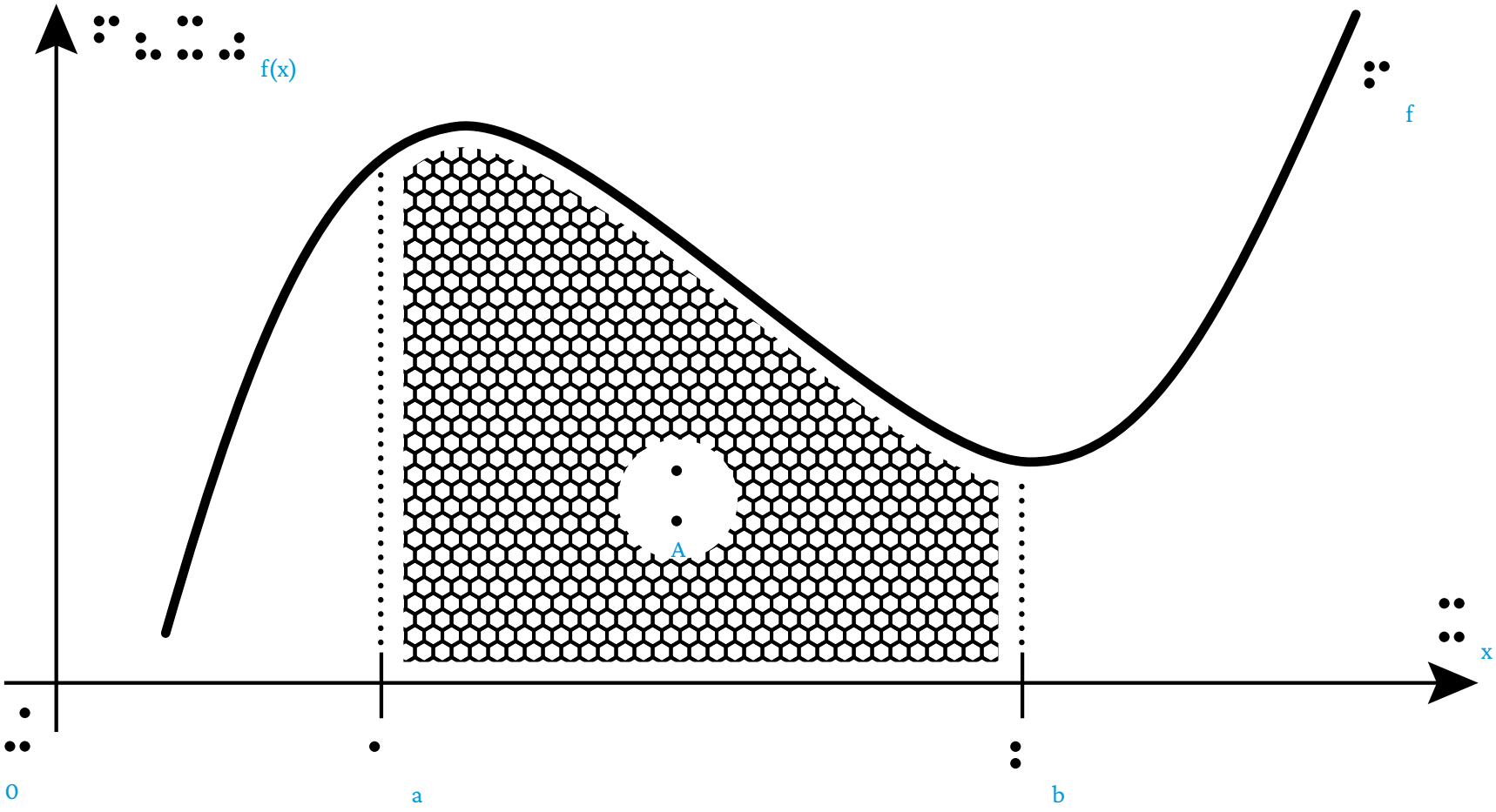


=Nullstellen


Wasserstand in cm
140
120
100
80
60
Zeit in Tagen
0
1
2
3
4
5

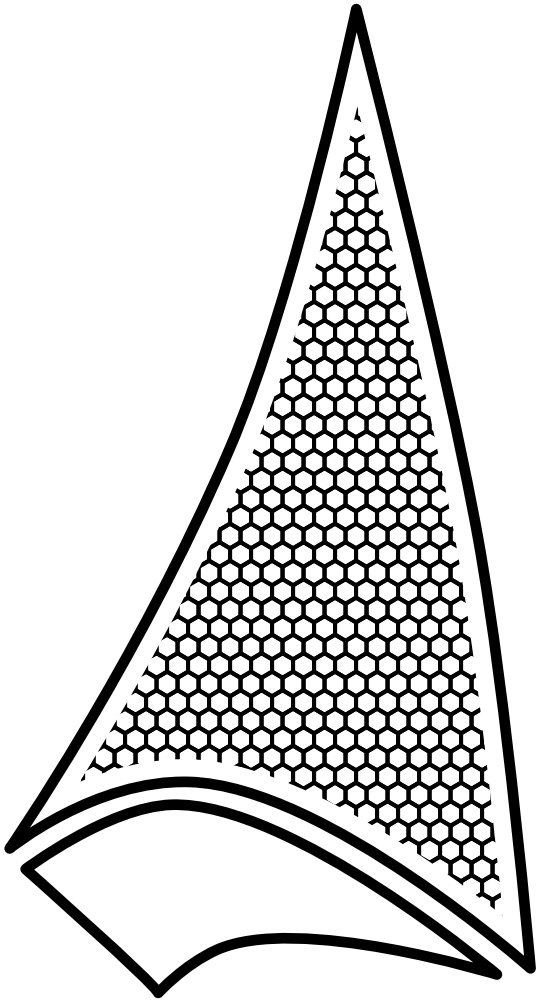

f(x)
f
Tangente
k
'al
1
x
0
x

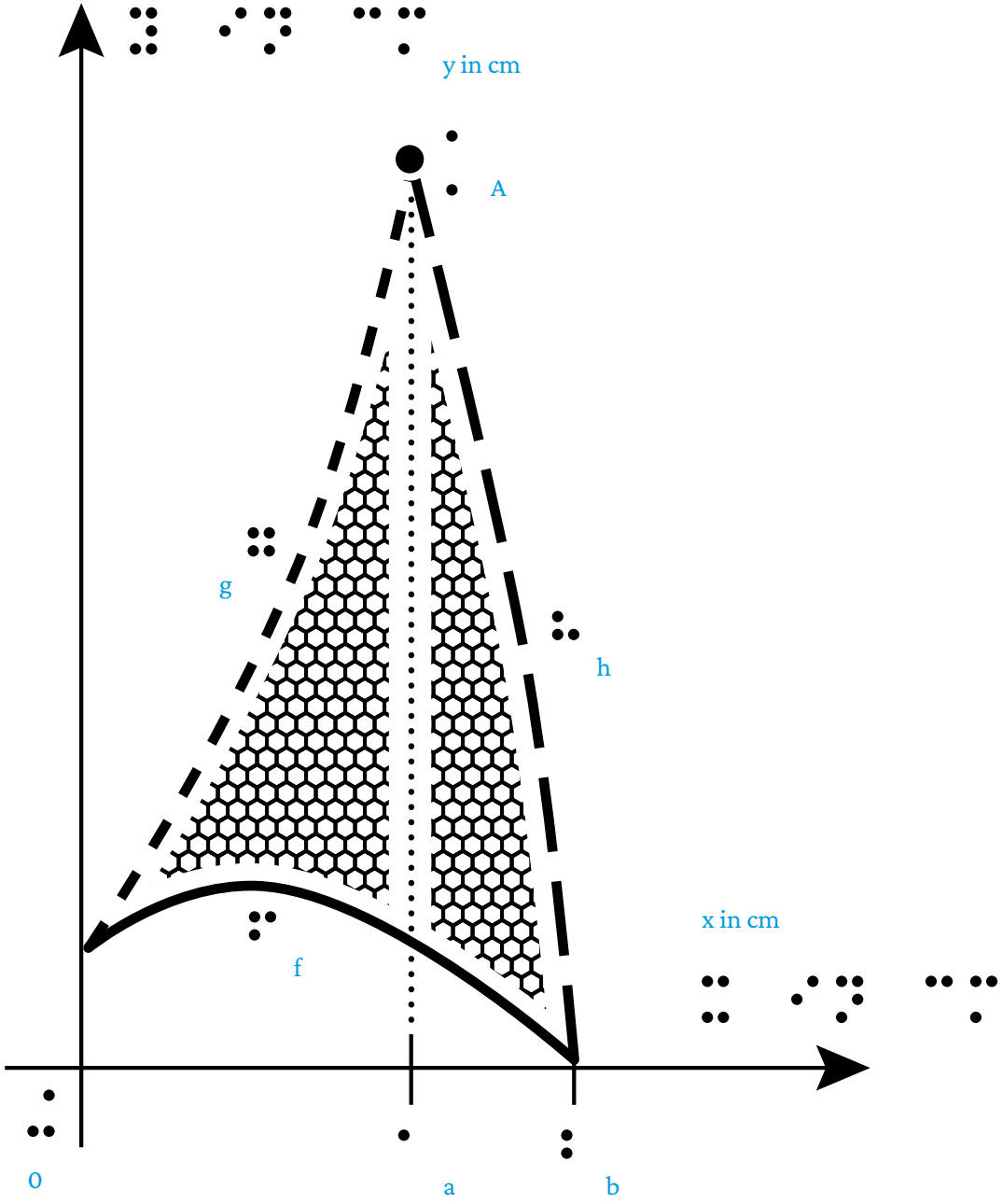
Fläche unterhalb von f



'int[a; b](f(x) 'dx)

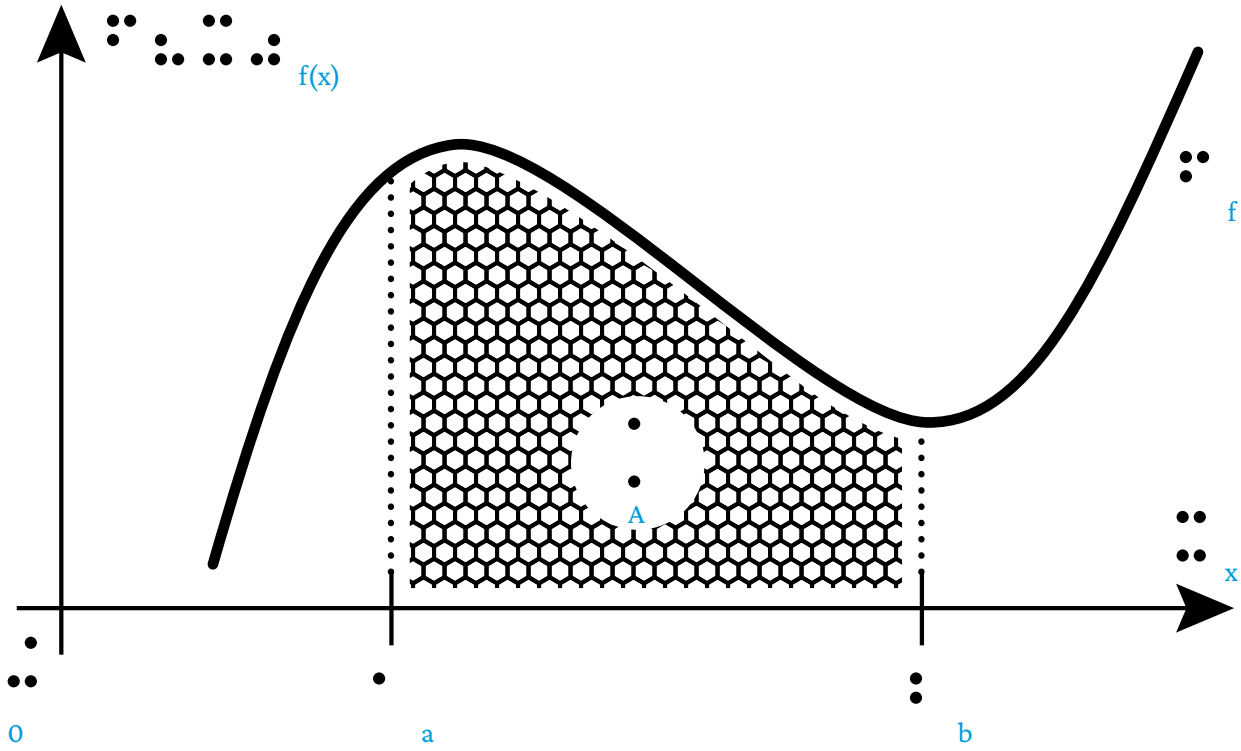
das Logo



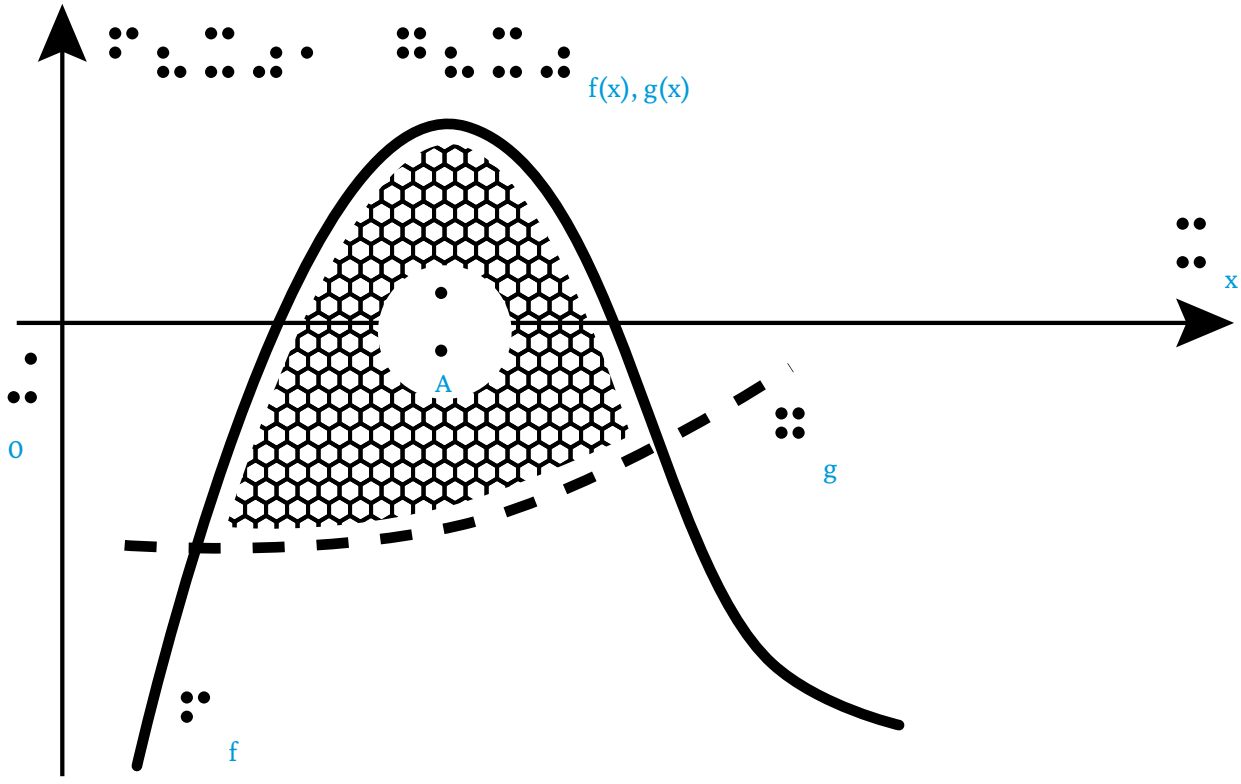


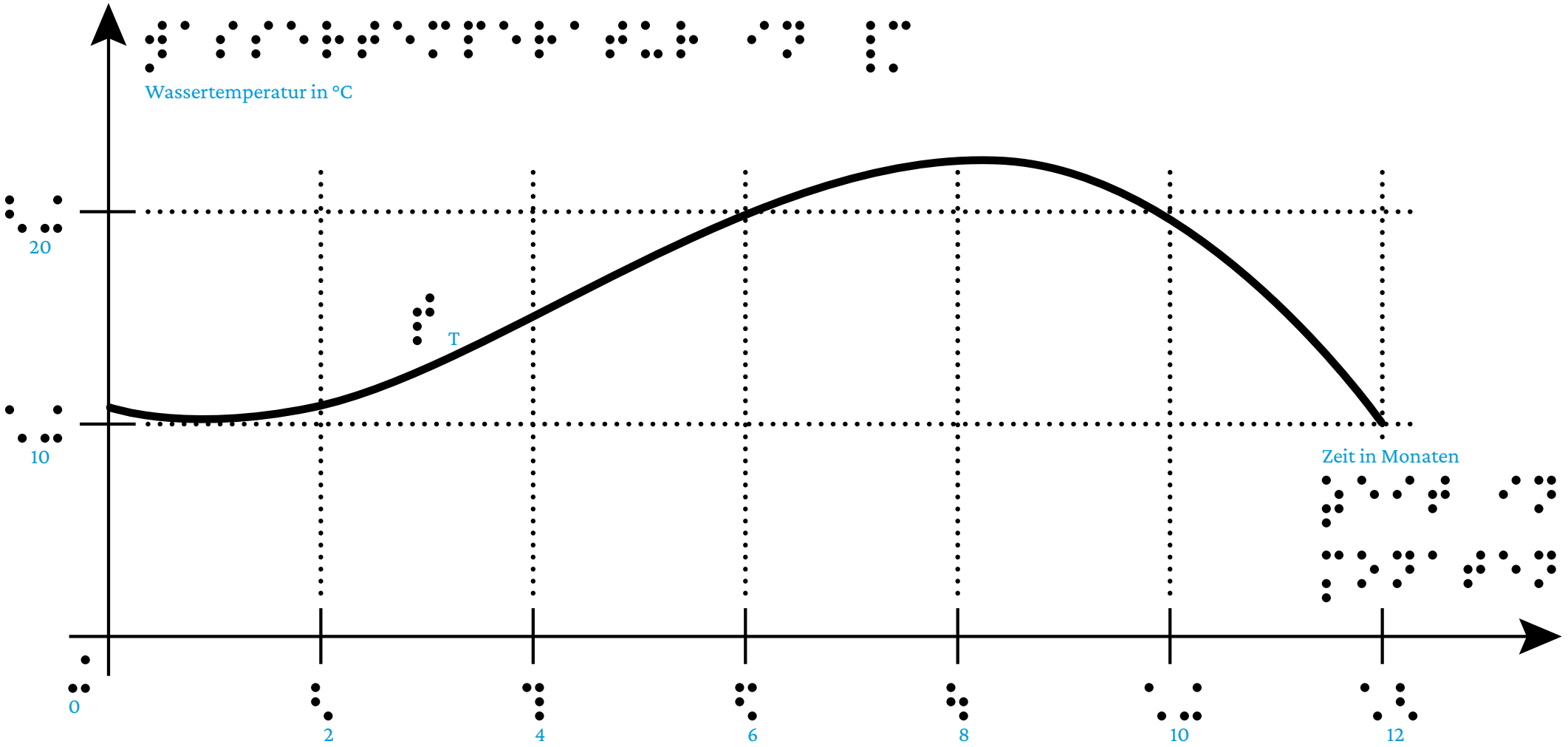
S.94 WH13 Hin. zu a)

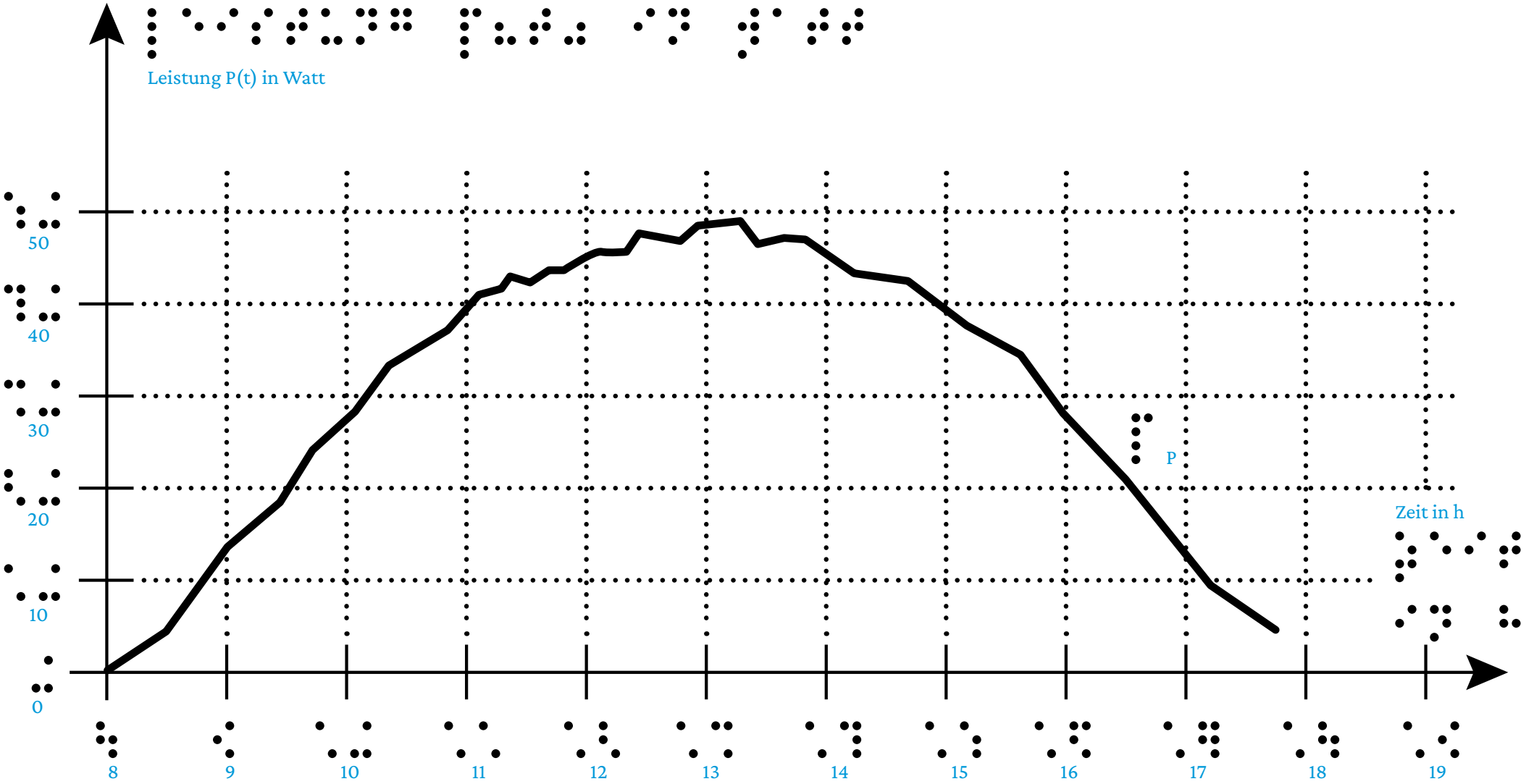
Fläche unterhalb von f

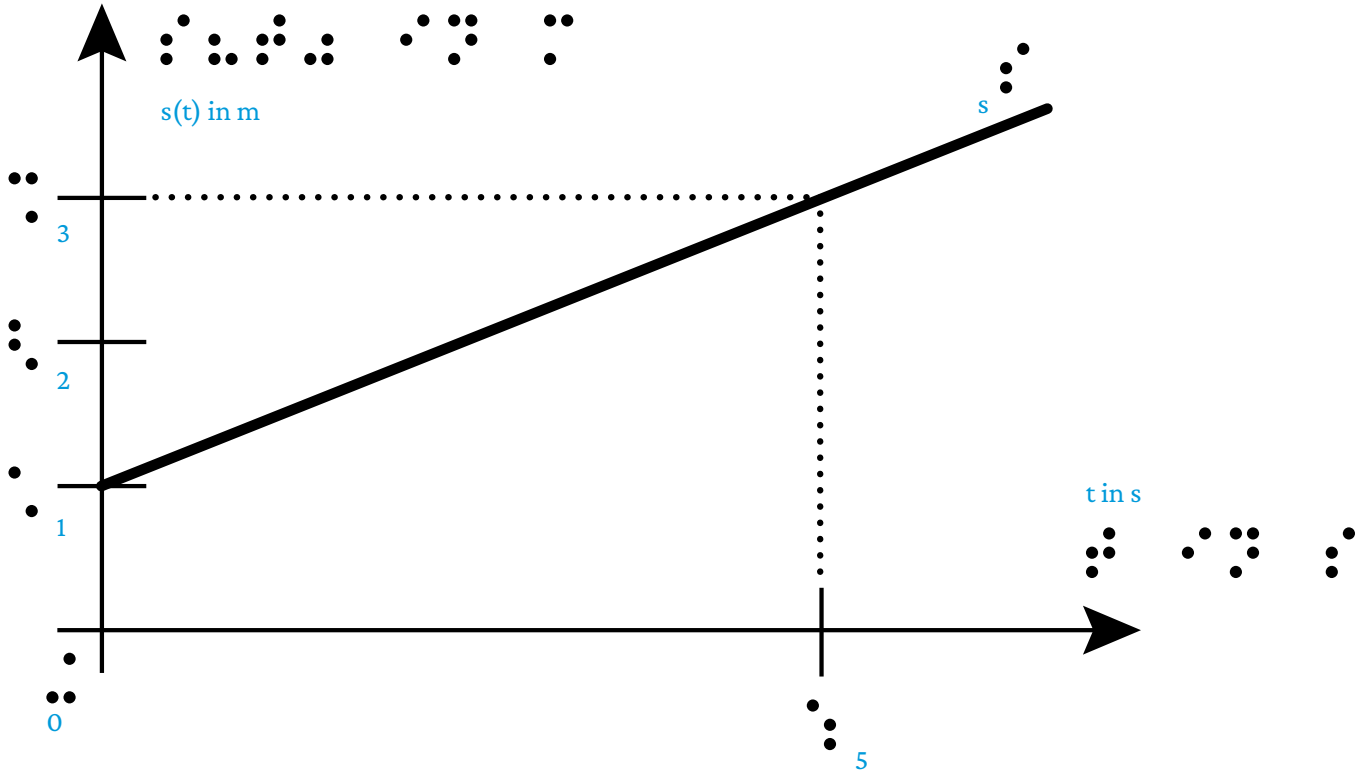


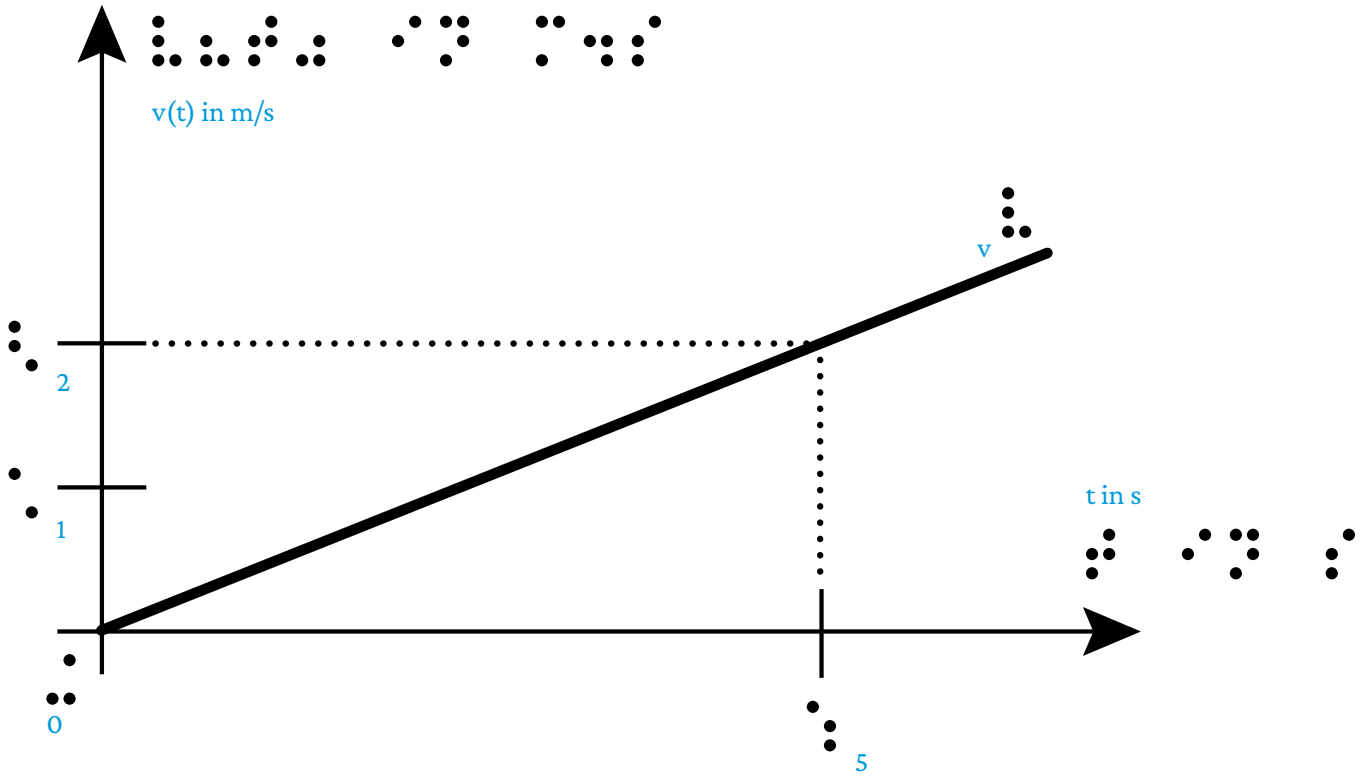
Fläche zwischen f und g



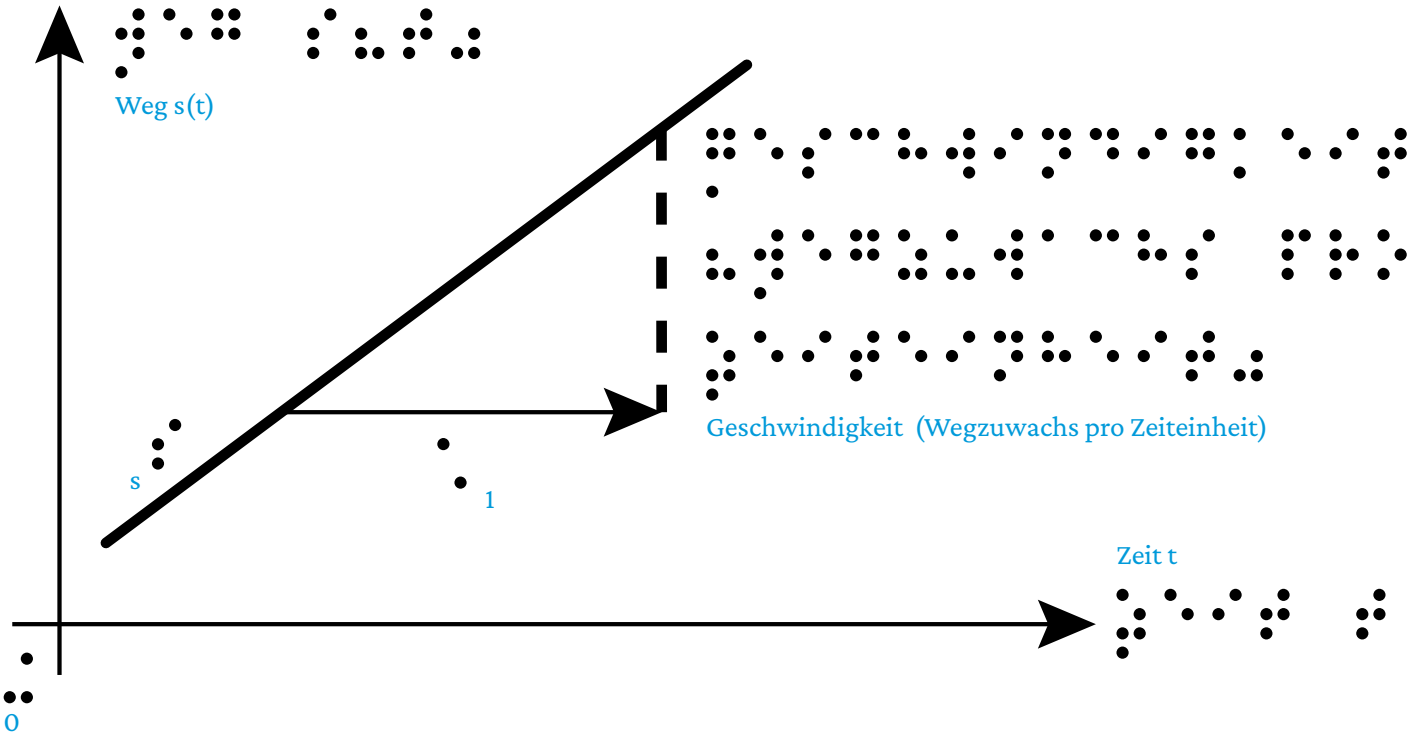

Wassertemperatur in °C
20
10
T
Zeit in Monaten
0
2
4
6
8
10
12

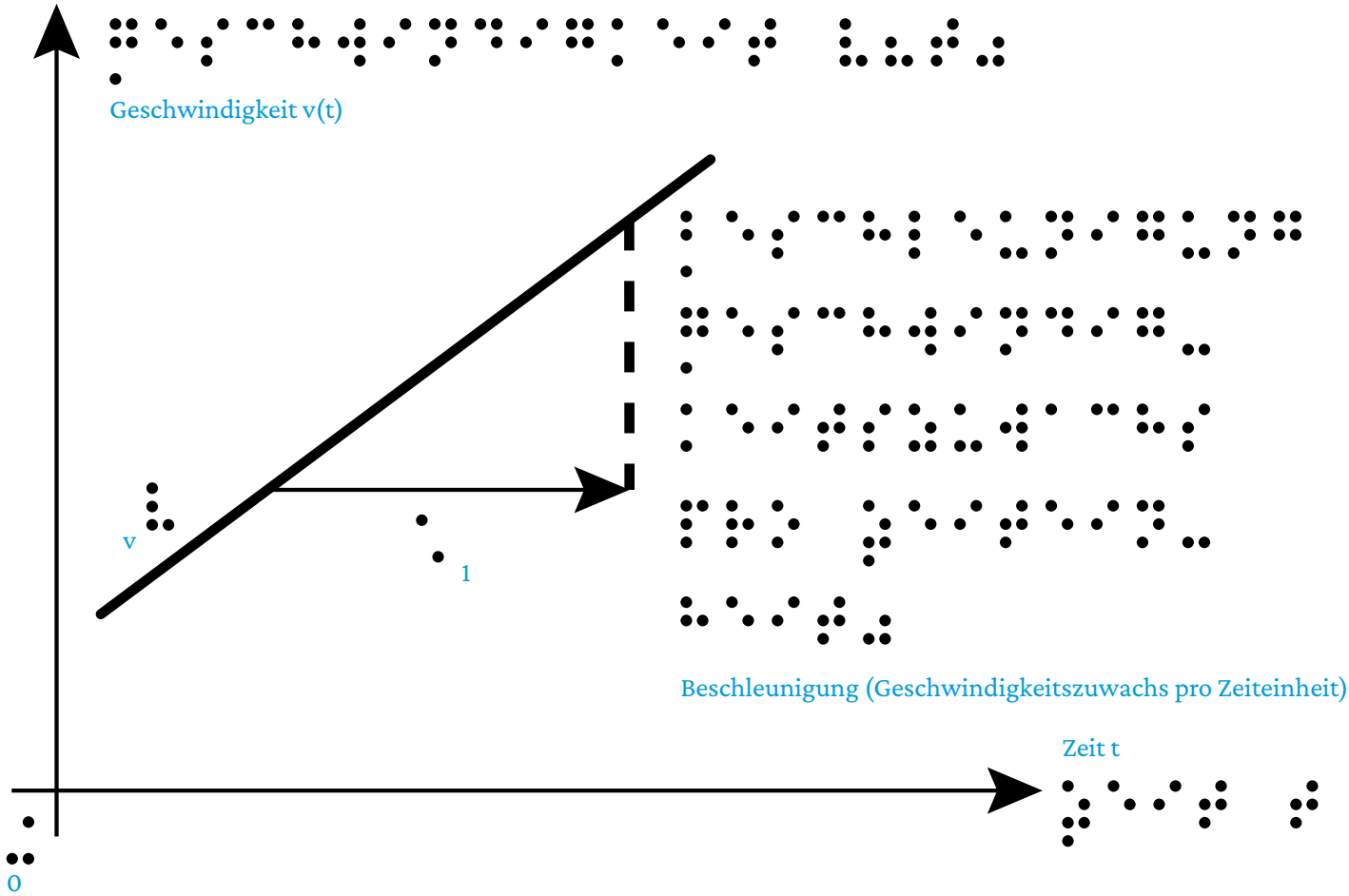

Leistung P(t) in Watt
50
40
30
20
10
0
P
Zeit in h
8
9
10
11
12
13
14
15
16
17
18
19

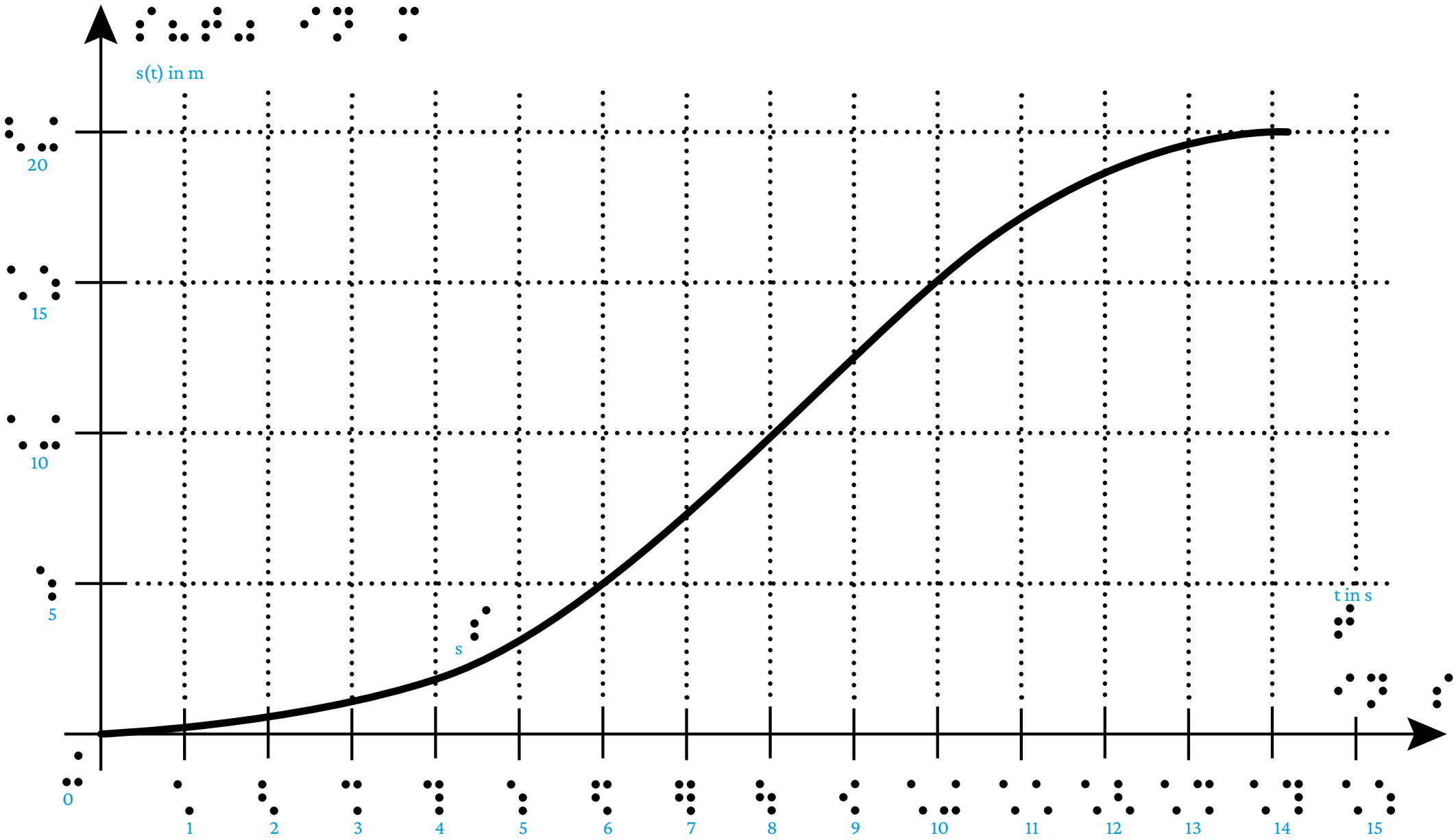

s(t) in m
s
3
2
1
0
5
t in s

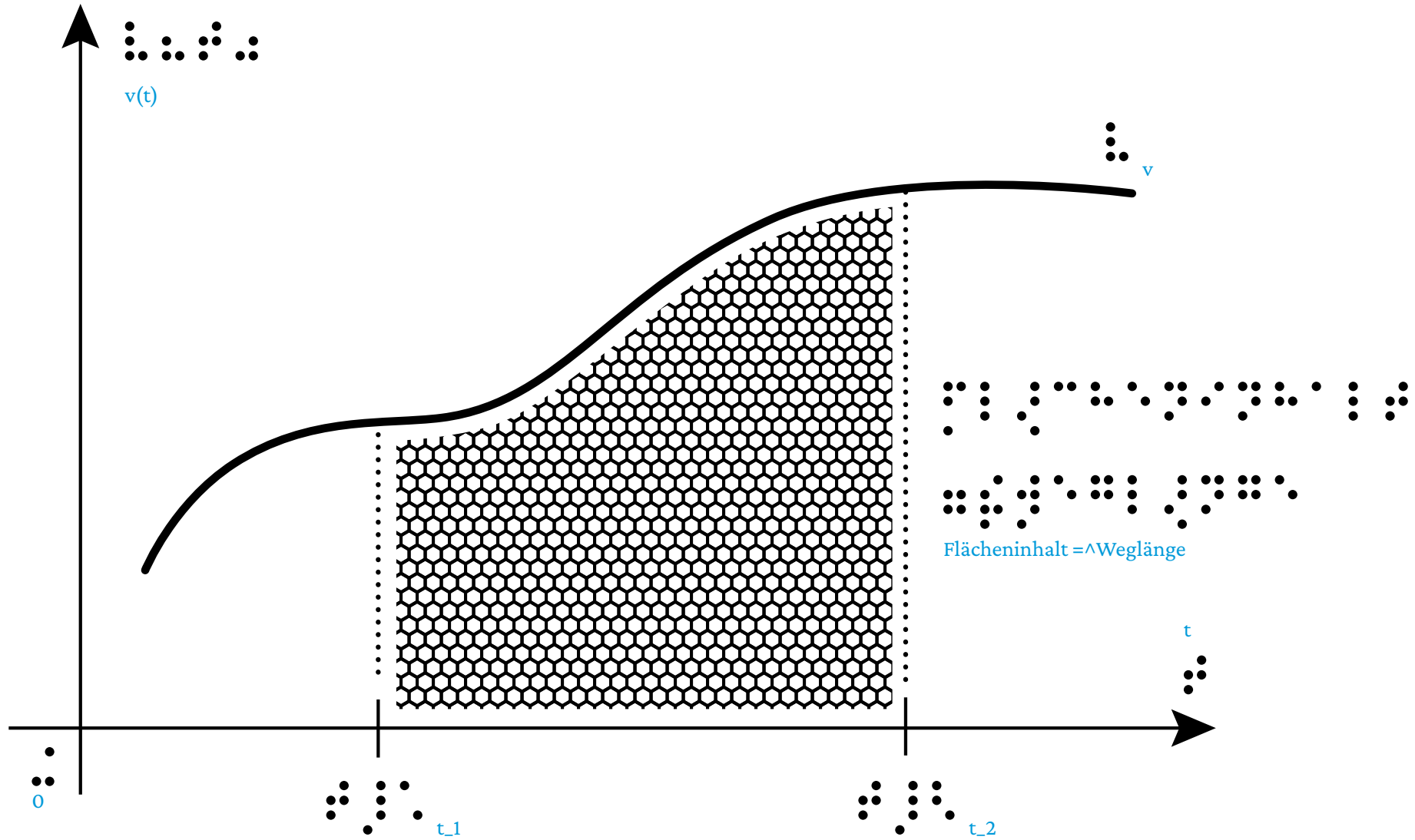

v(t) in m/s
v
2
1
0
5
t in s

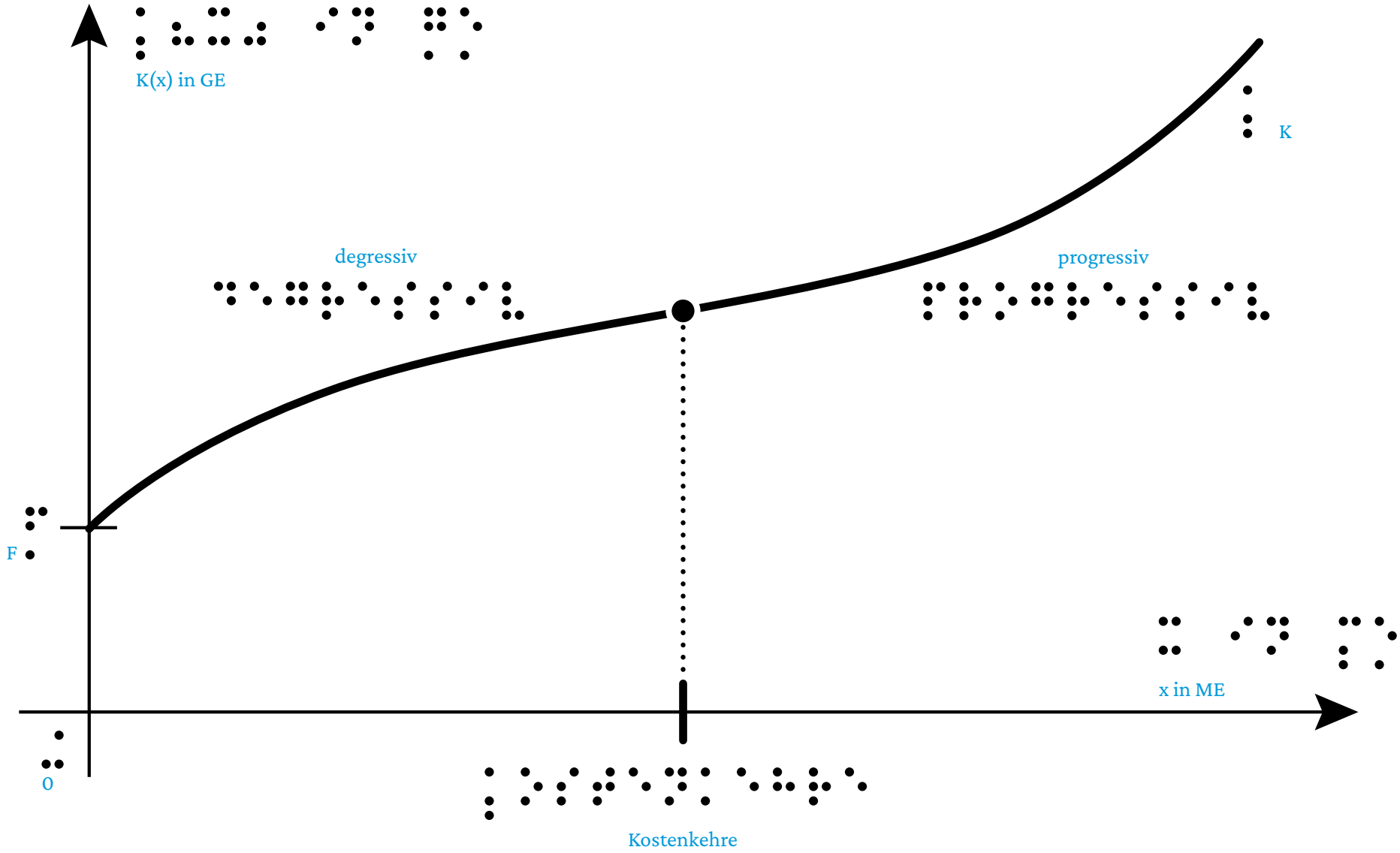
S.96 WH14 Hin. zu b)

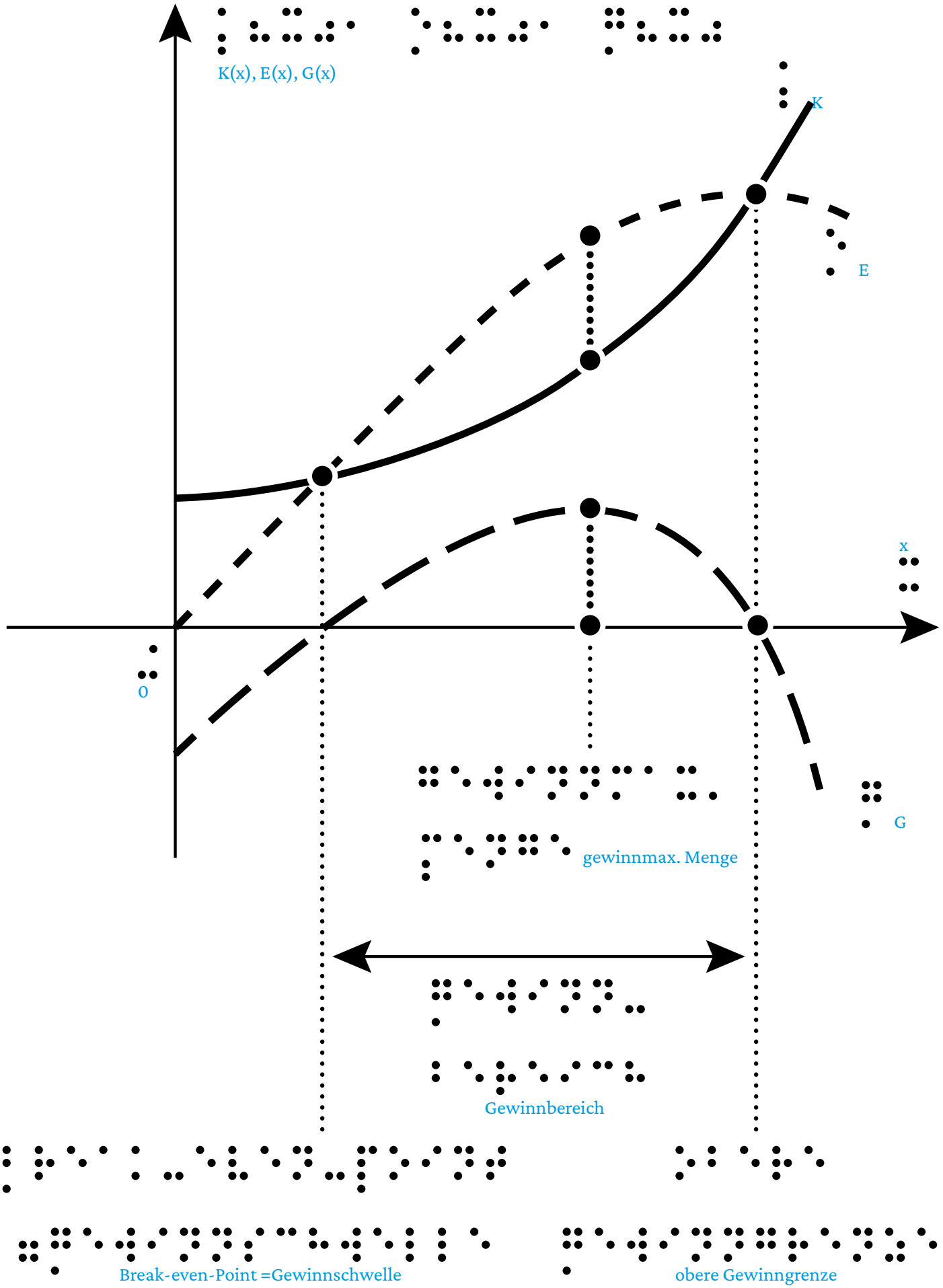




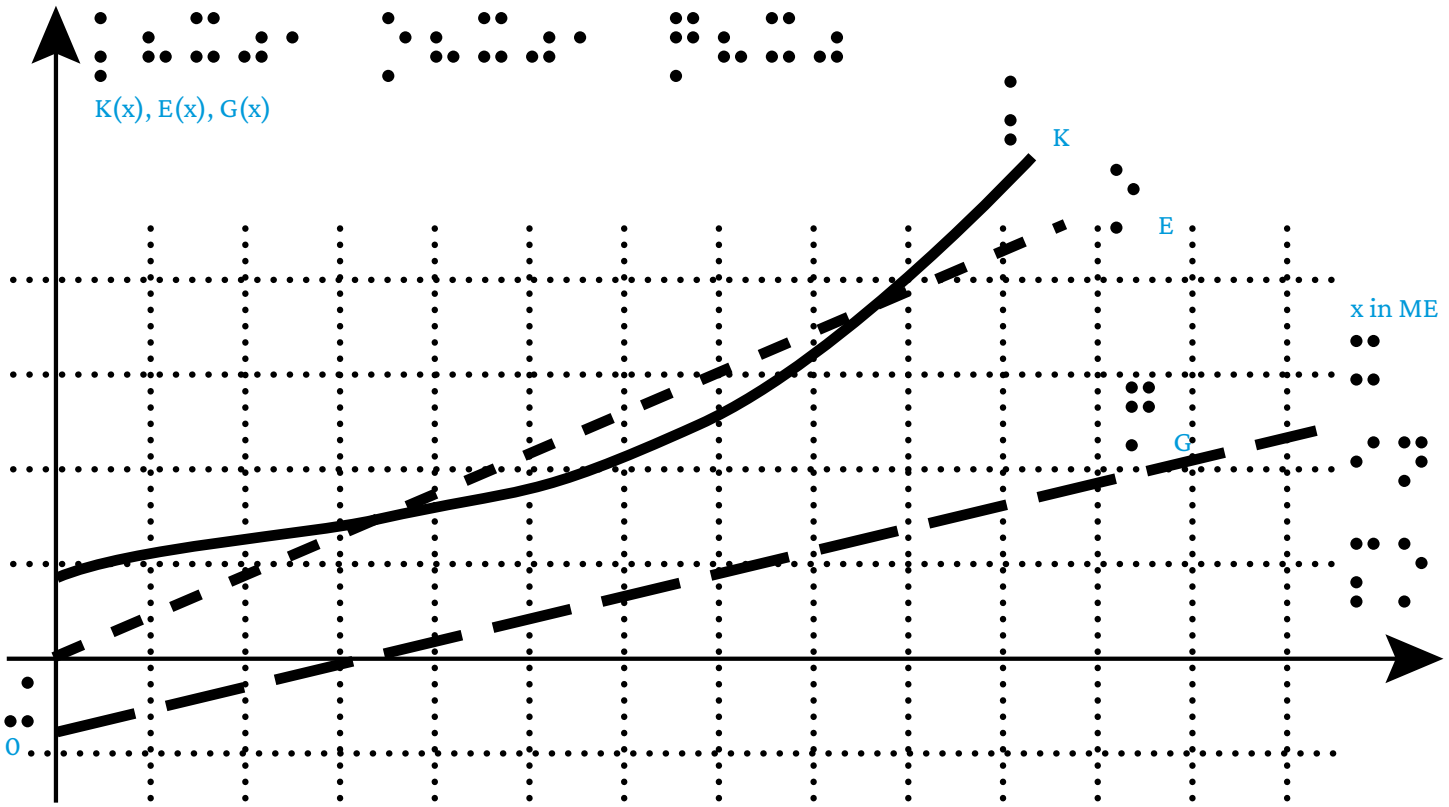

s(t) in m
20
15
10
5
s
t in s
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15


v(t)
v
Flächeninhalt =^Weglänge
t
0
t_1
t_2

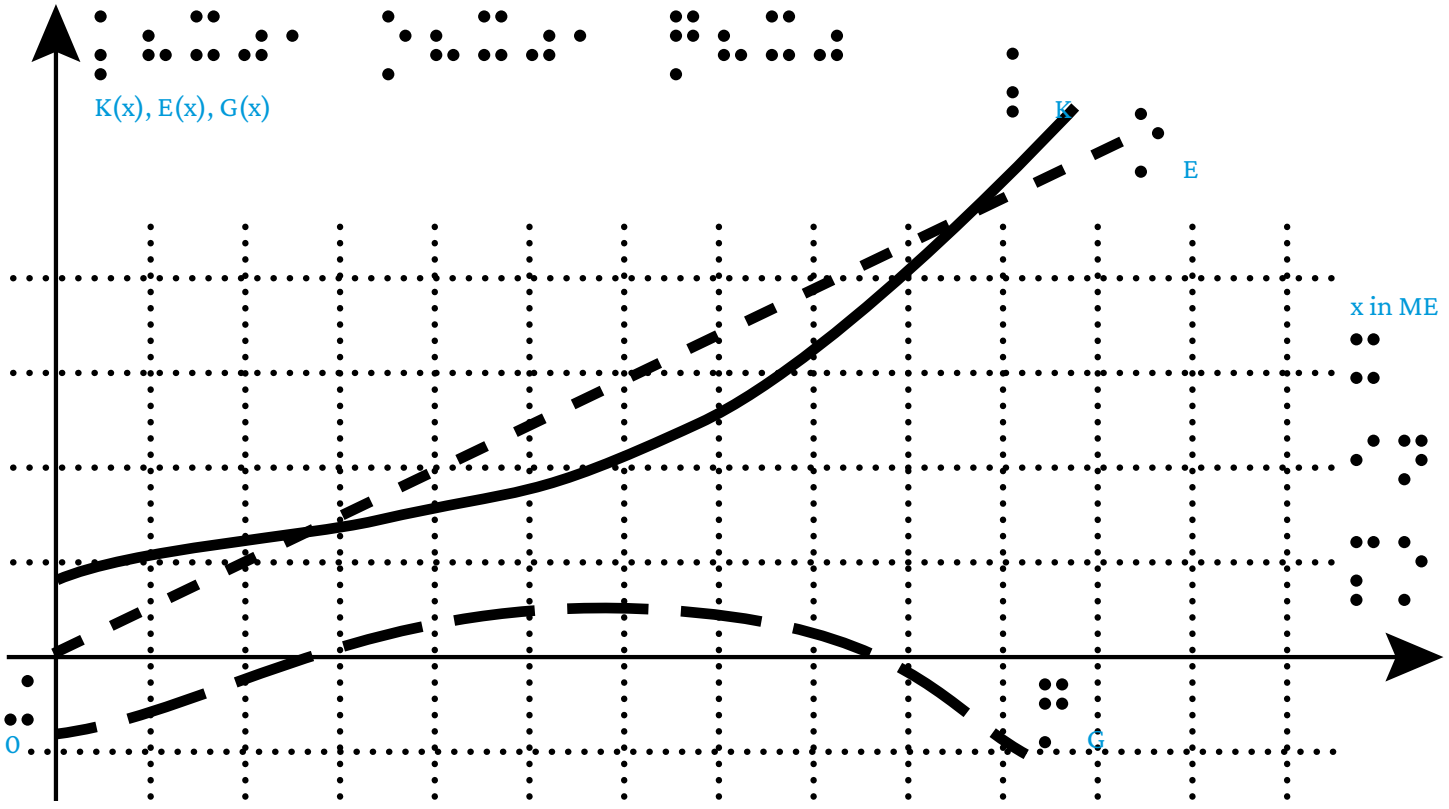

K(x) in GE
K
degressiv
progressiv
F
0
x in ME
Kostenkehre


K(x), E(x), G(x)
K
E
x
0
G
gewinnmax. Menge
Gewinnbereich
Break-even-Point =Gewinnschwelle
obere Gewinngrenze

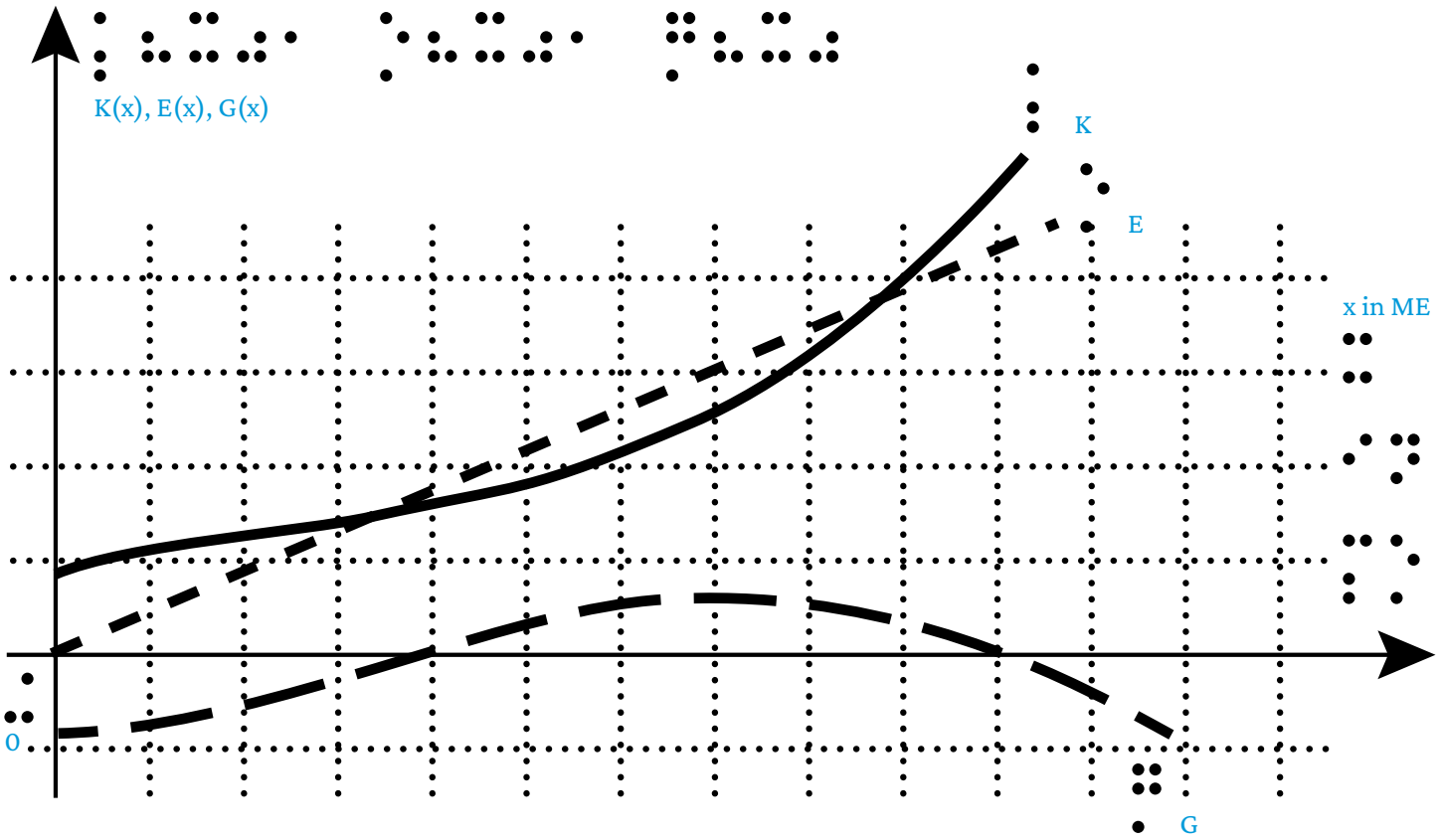
1)



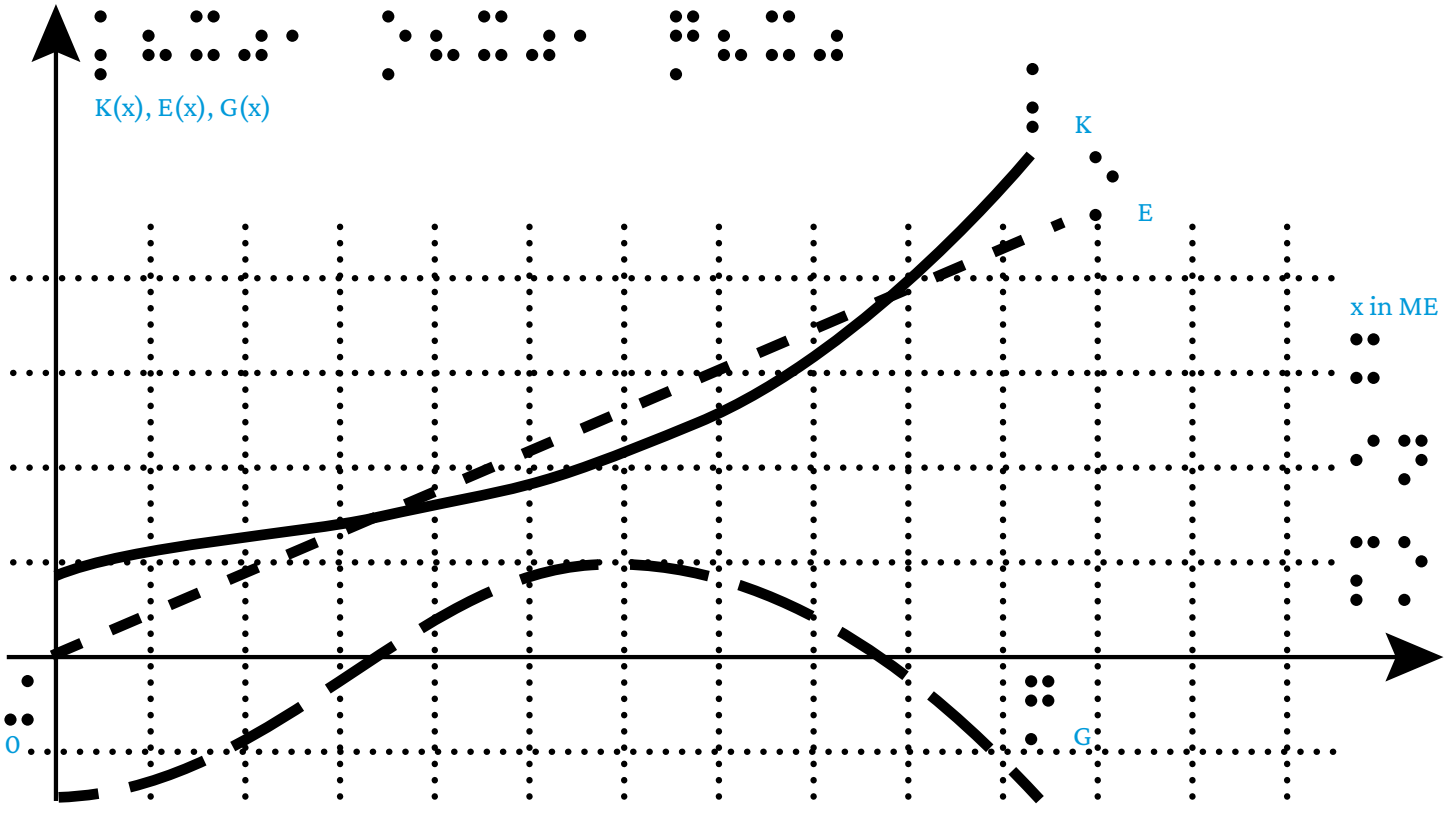
2)



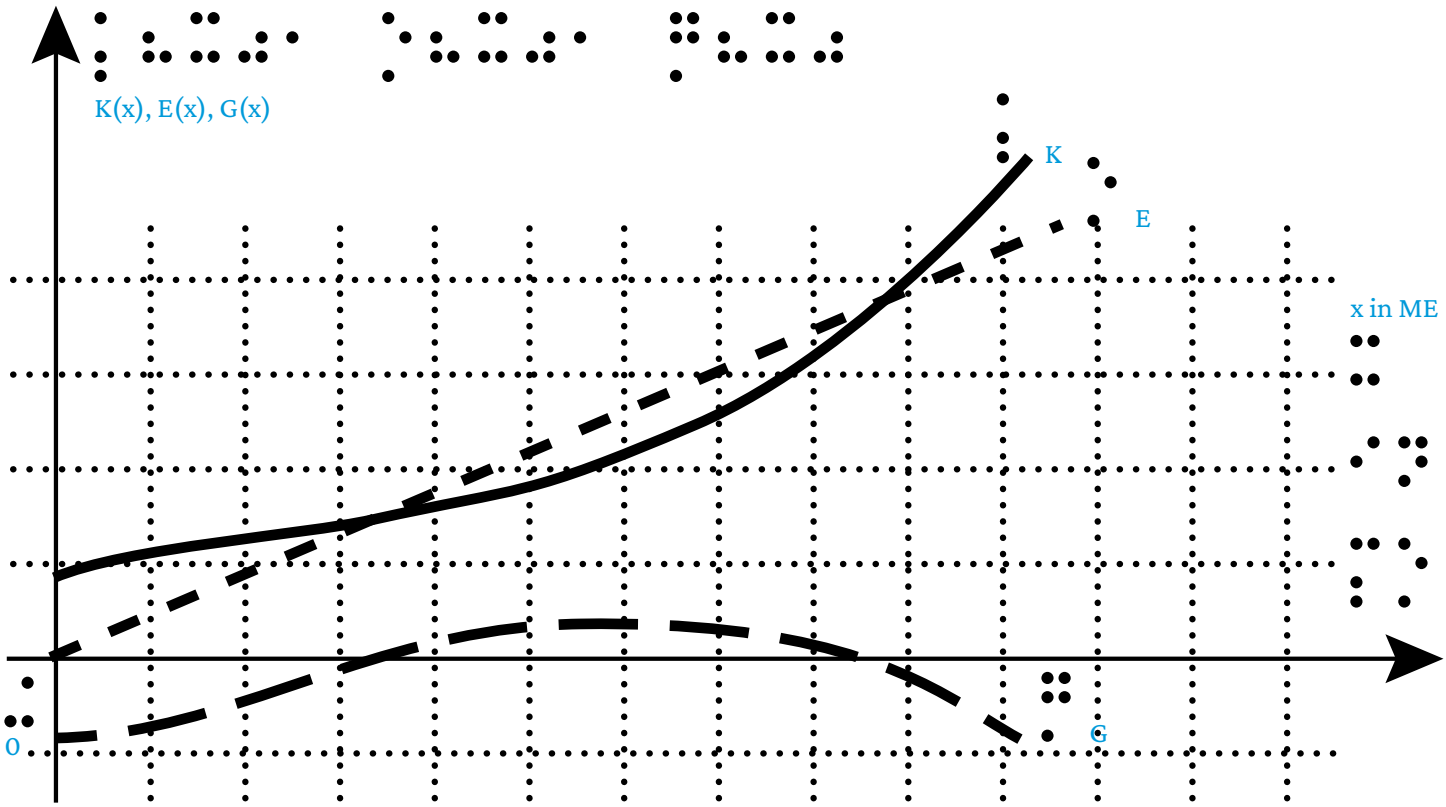
3)



4)

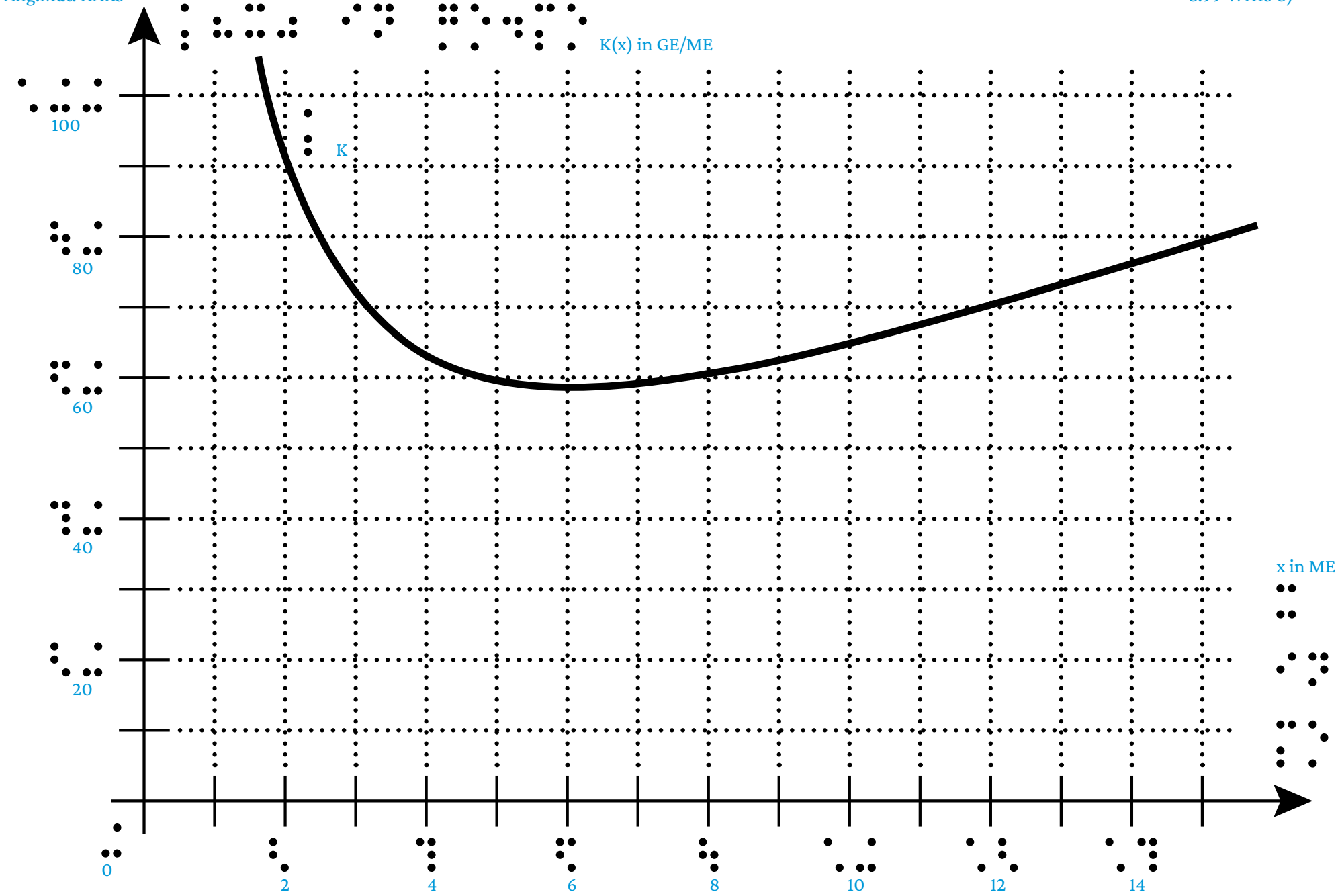


5)

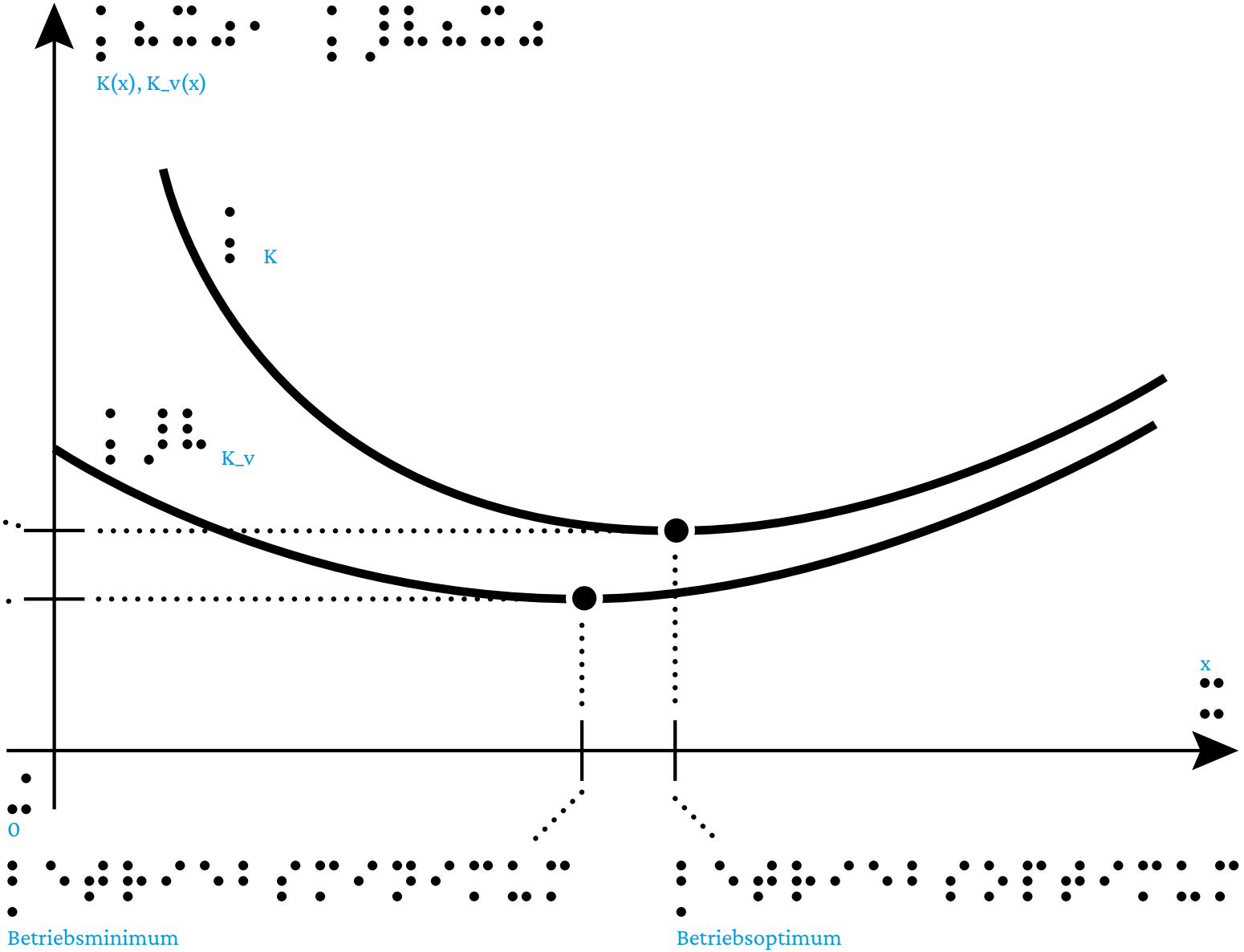


Ang.Mat. HAK5

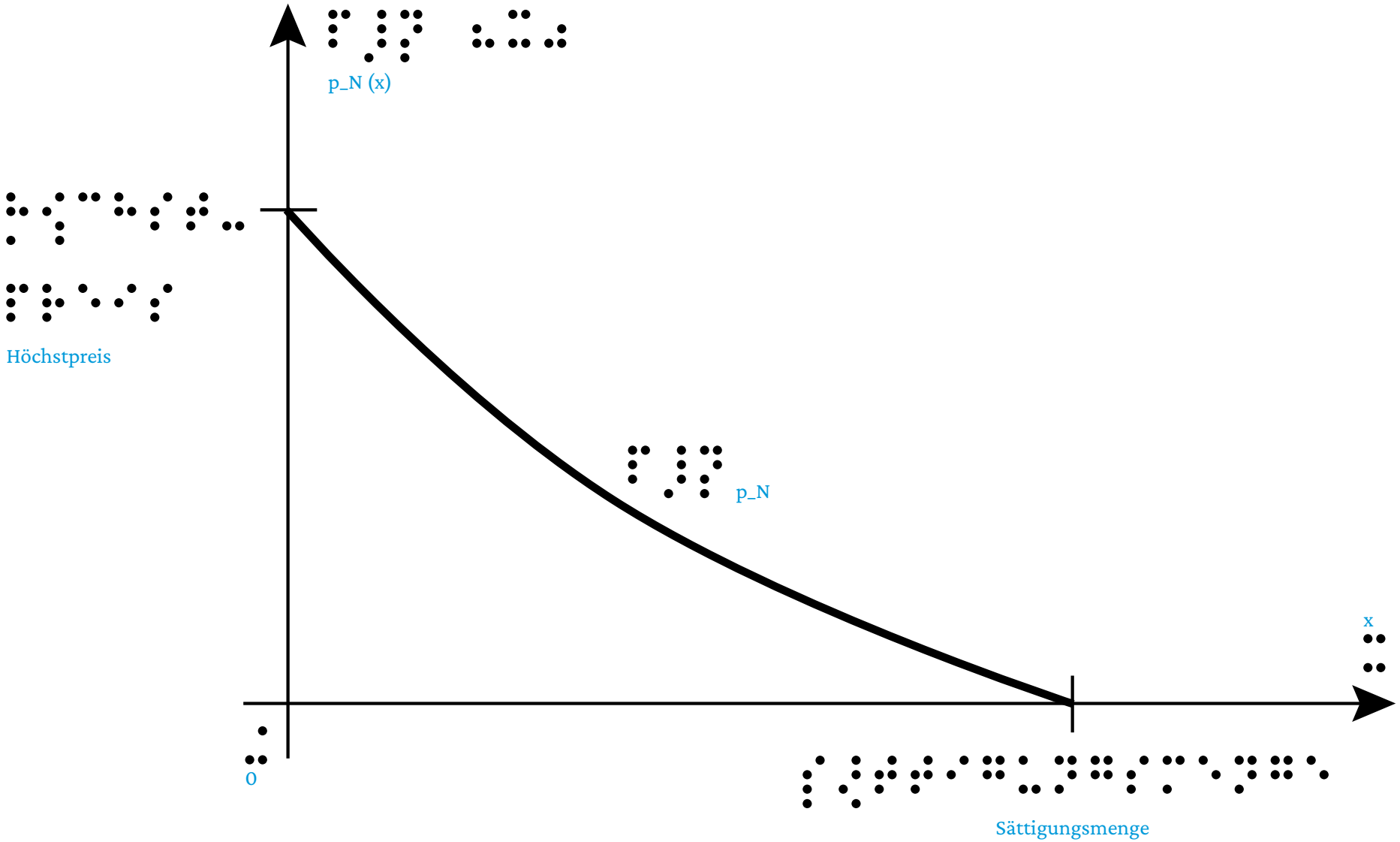
S.99 WH15 b)

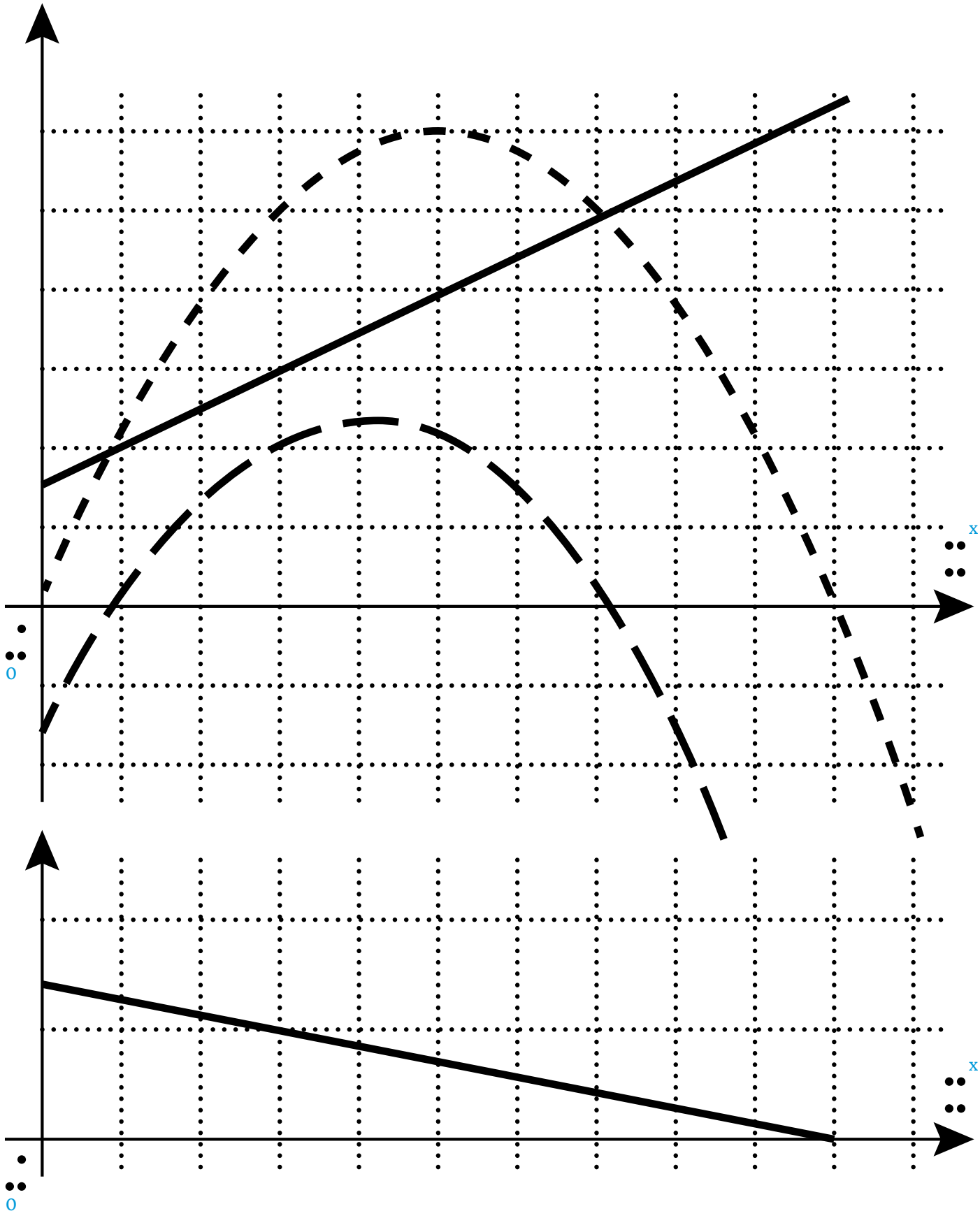


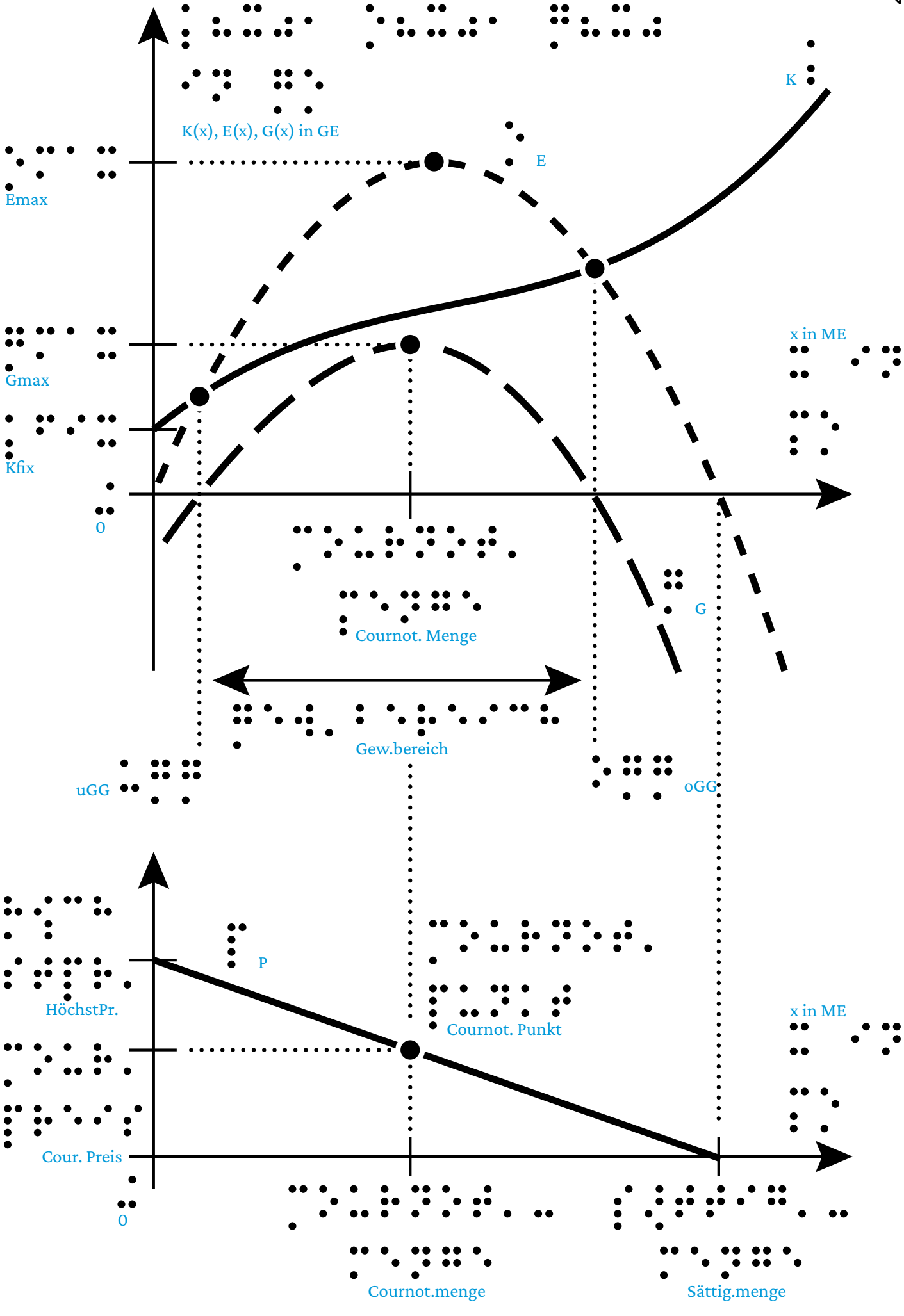
langfristige Preisuntergrenze

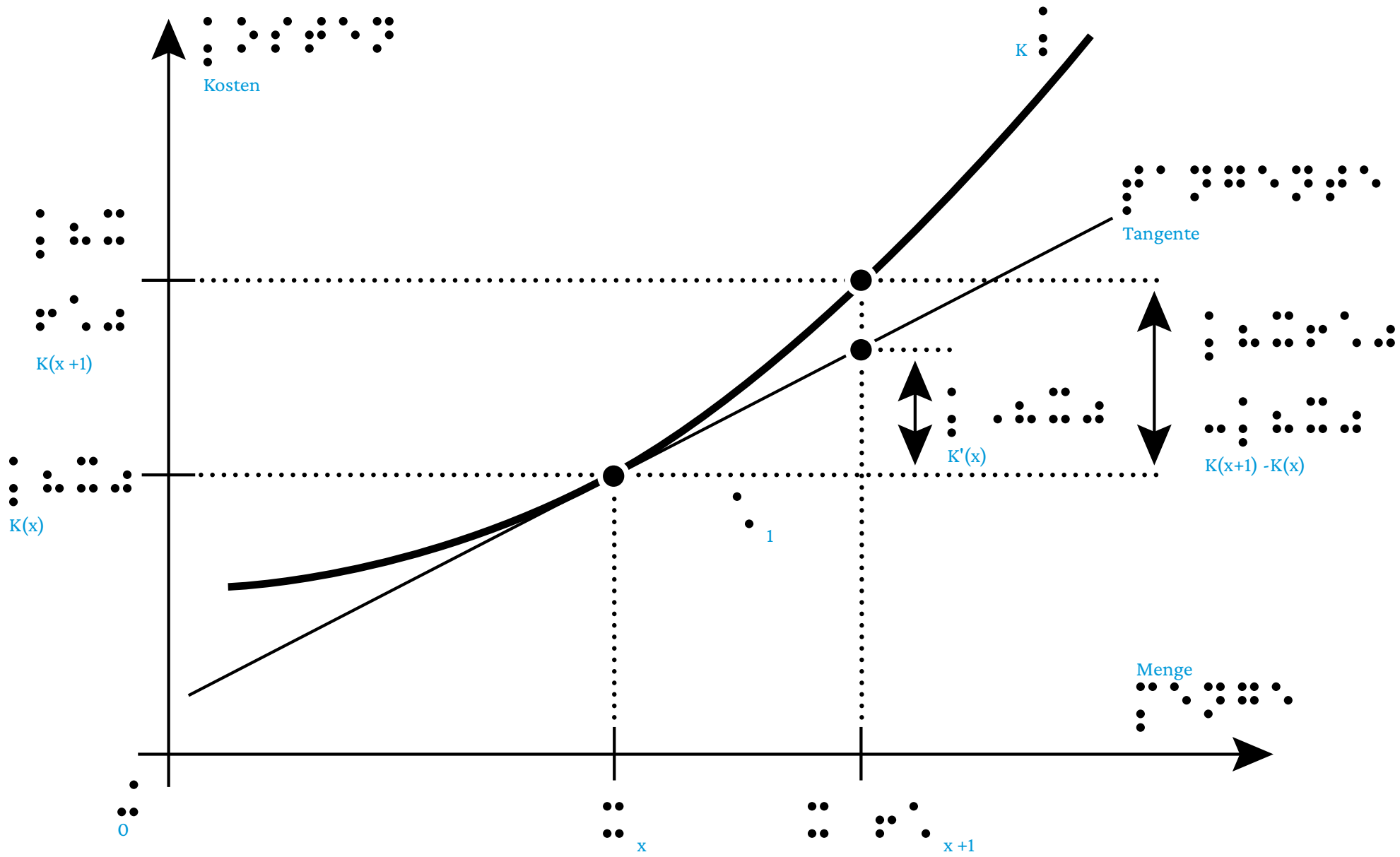


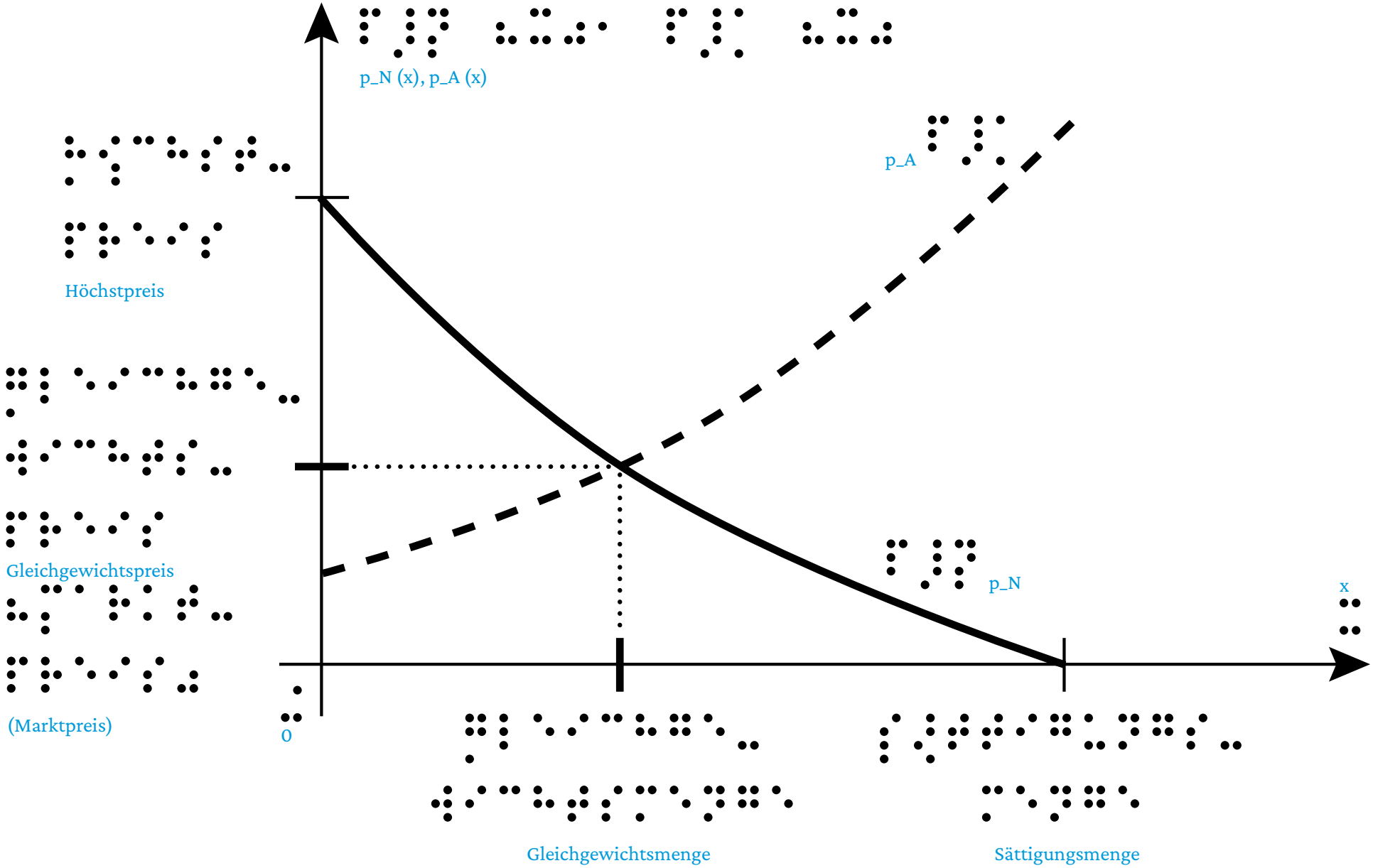
kurzfristige Preisuntergrenze

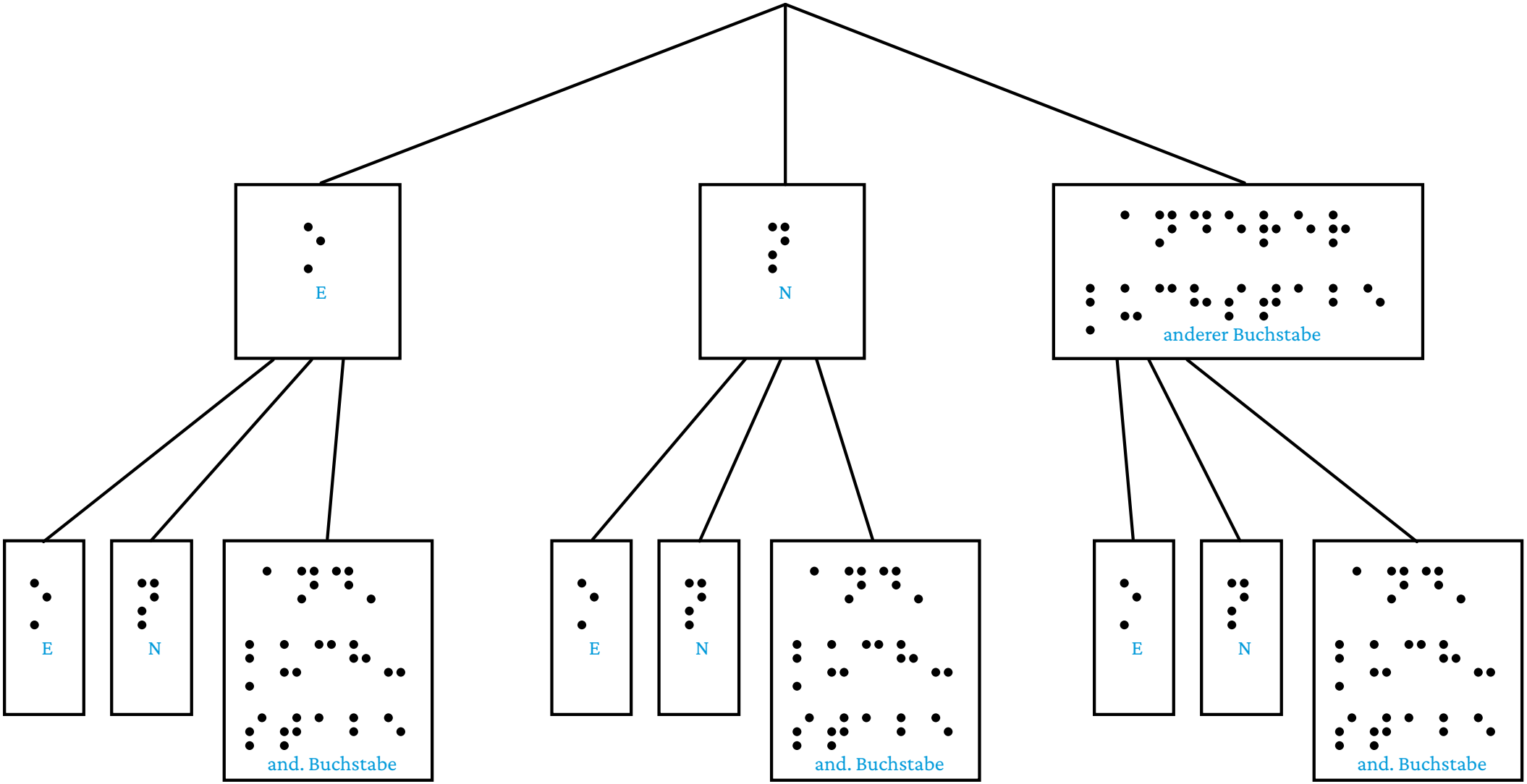

p_N (x)
Höchstpreis
p_N
x
0
Sättigungsmenge


x
0
x
0


K(x), E(x), G(x) in GE
K
E
Emax
Gmax
Kfix
0
x in ME
G
Cournot. Menge
Gew.bereich
uGG
oGG
P
HöchstPr.
Cournot. Punkt
x in ME
Cour. Preis
0
Cournot.menge
Sättig.menge

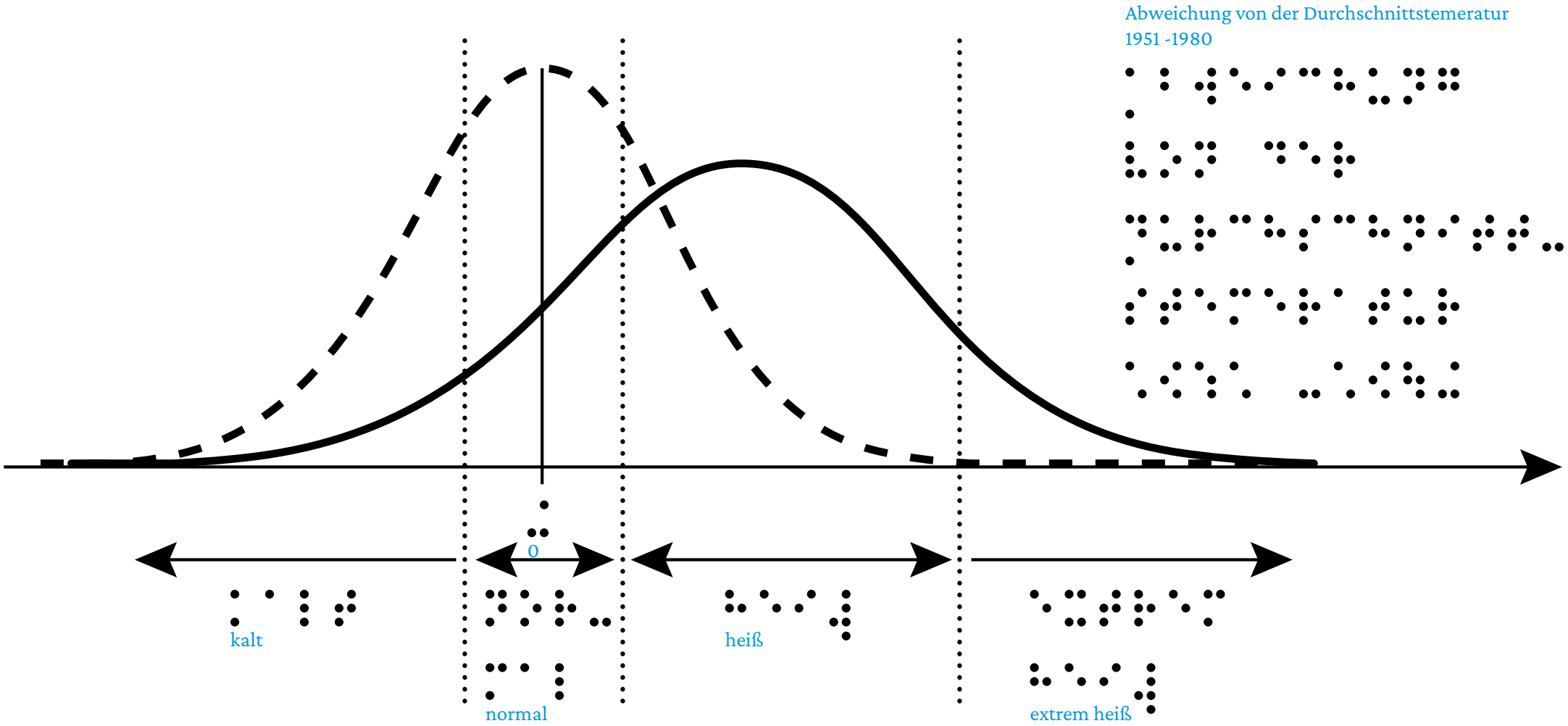

Kosten
K
Tangente
K(x +1)
K'(x)
K(x+1) -K(x)
K(x)
1
Menge
0
x
x +1

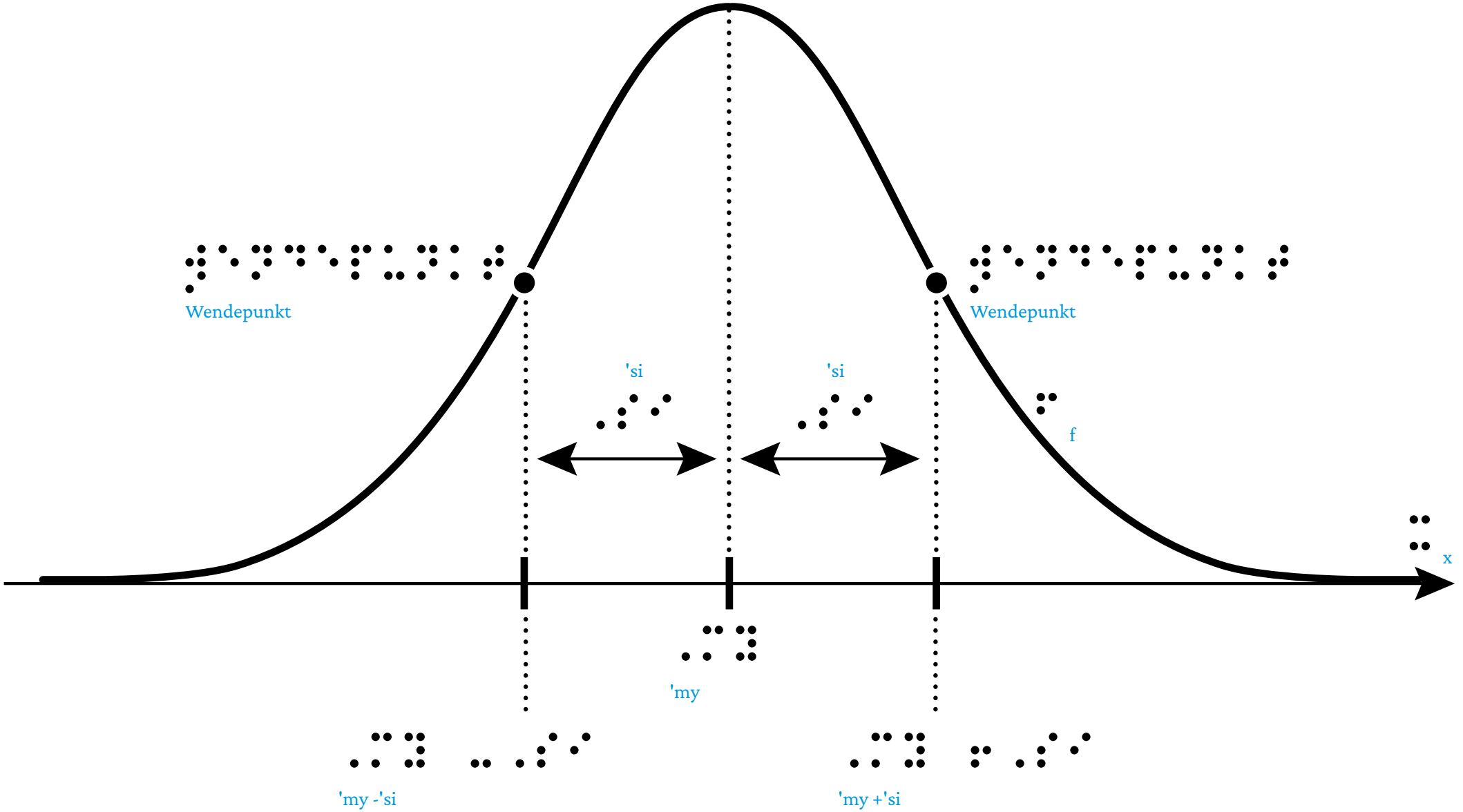

p_N (x), p_A (x)
p_A
Höchstpreis
Gleichgewichtspreis
(Marktpreis)
p_N
x
0
Gleichgewichtsmenge
Sättigungsmenge

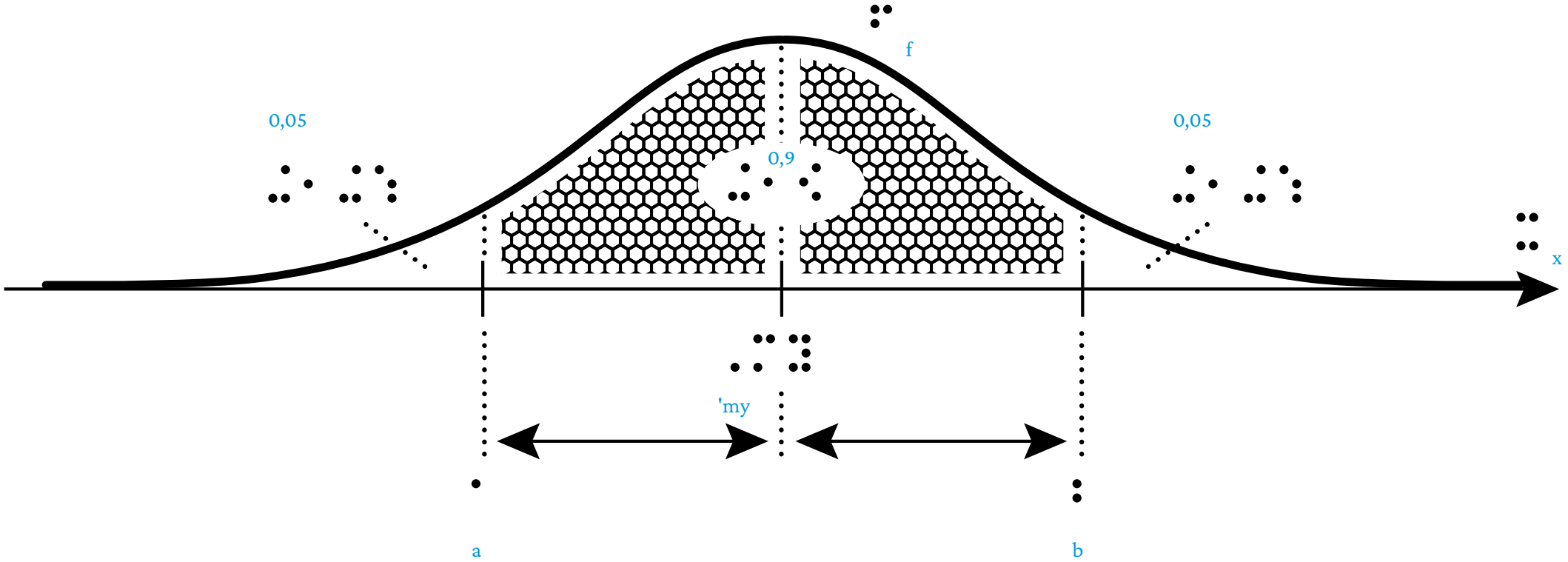

E
N
anderer Buchstabe
E
N
and. Buchstabe
E
N
and. Buchstabe
E
N
and. Buchstabe

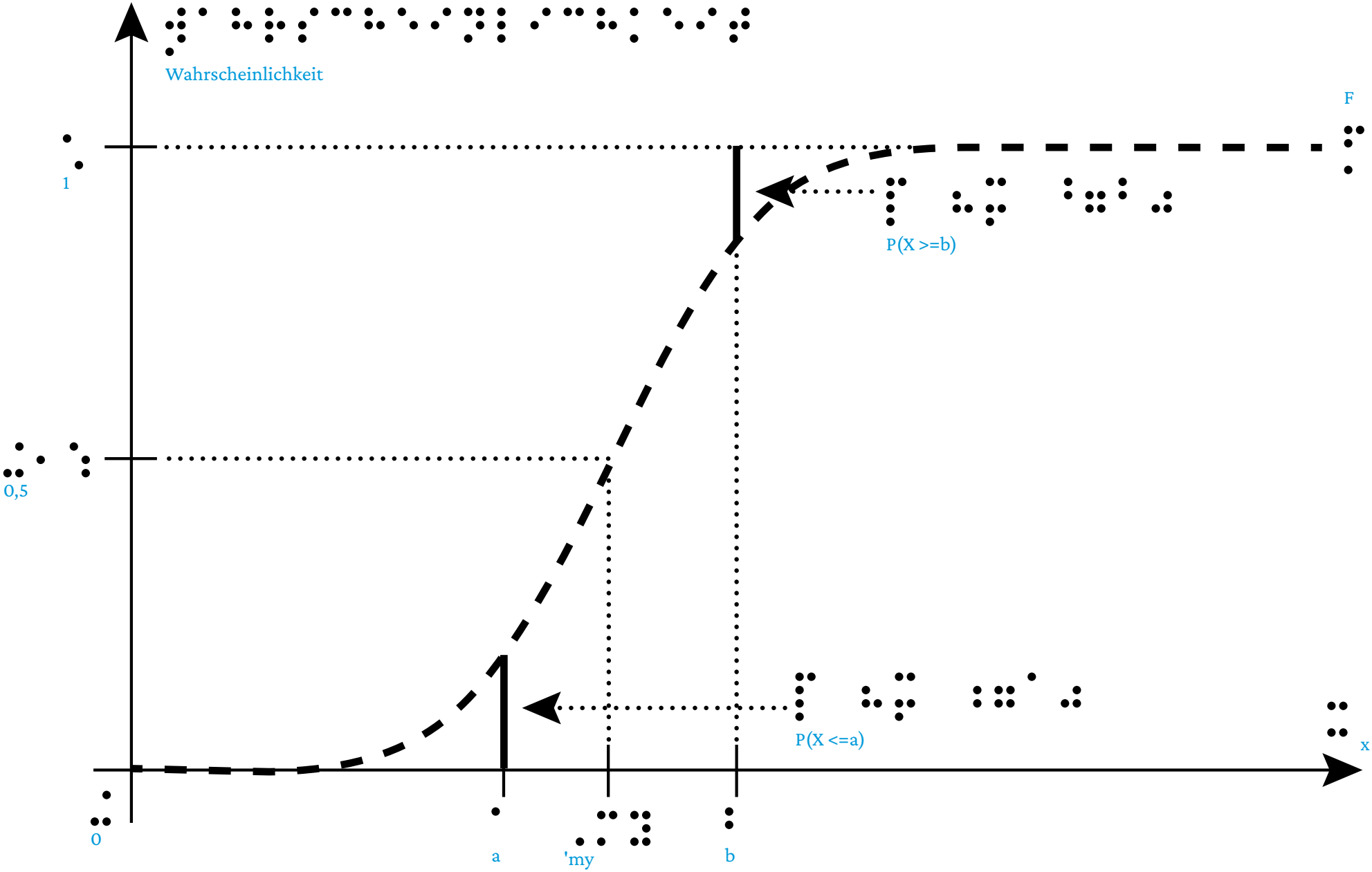
1951-1980

2005-2015




Wendepunkt
Wendepunkt
'si
'si
f
x
'my
'my -'si
'my +'si

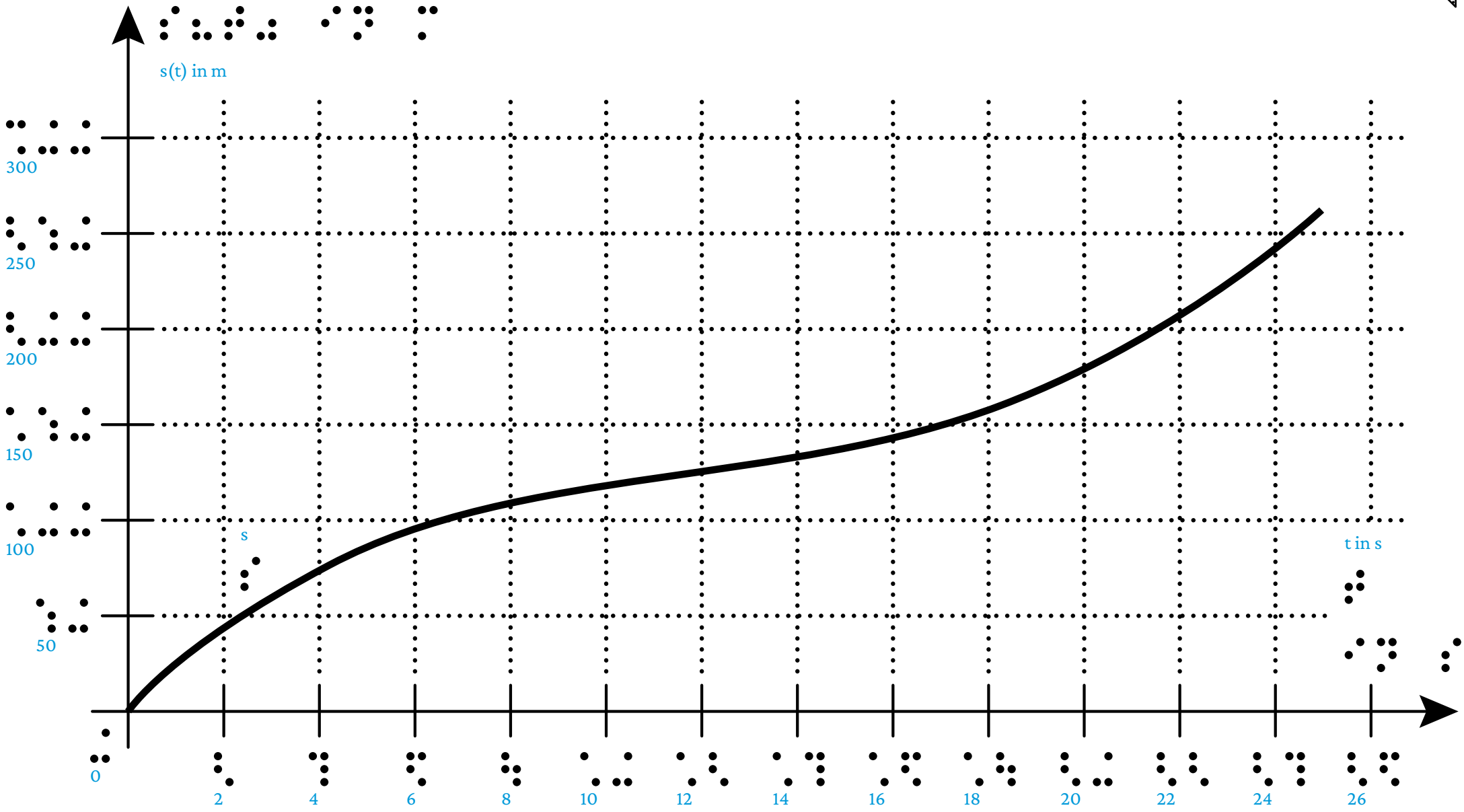

f
0,05
0,9
0,05
x
'my
a
b

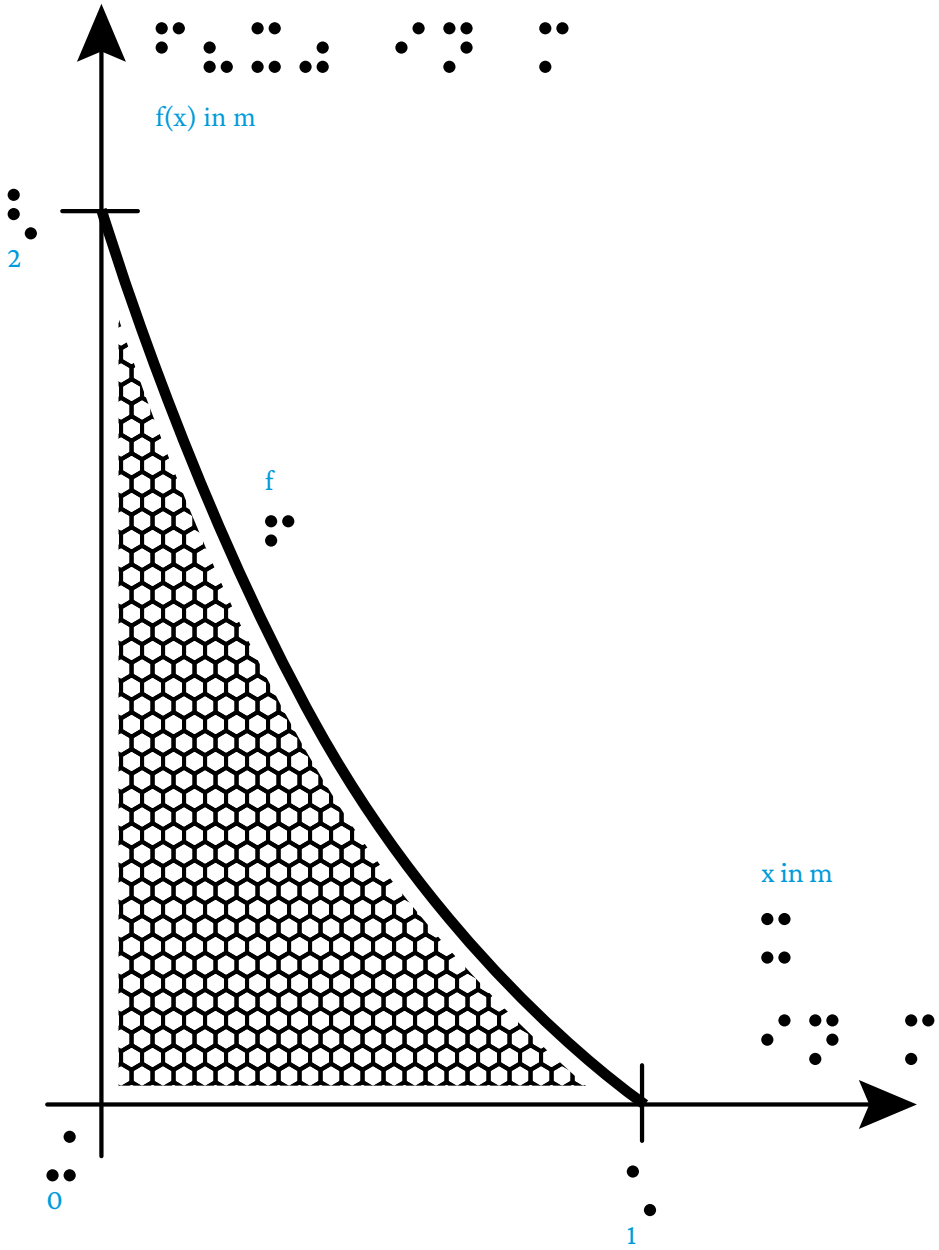

Wahrscheinlichkeit
F
1
0,5
P(X >=b)
P(X <=a)
x
0
a
'my
b

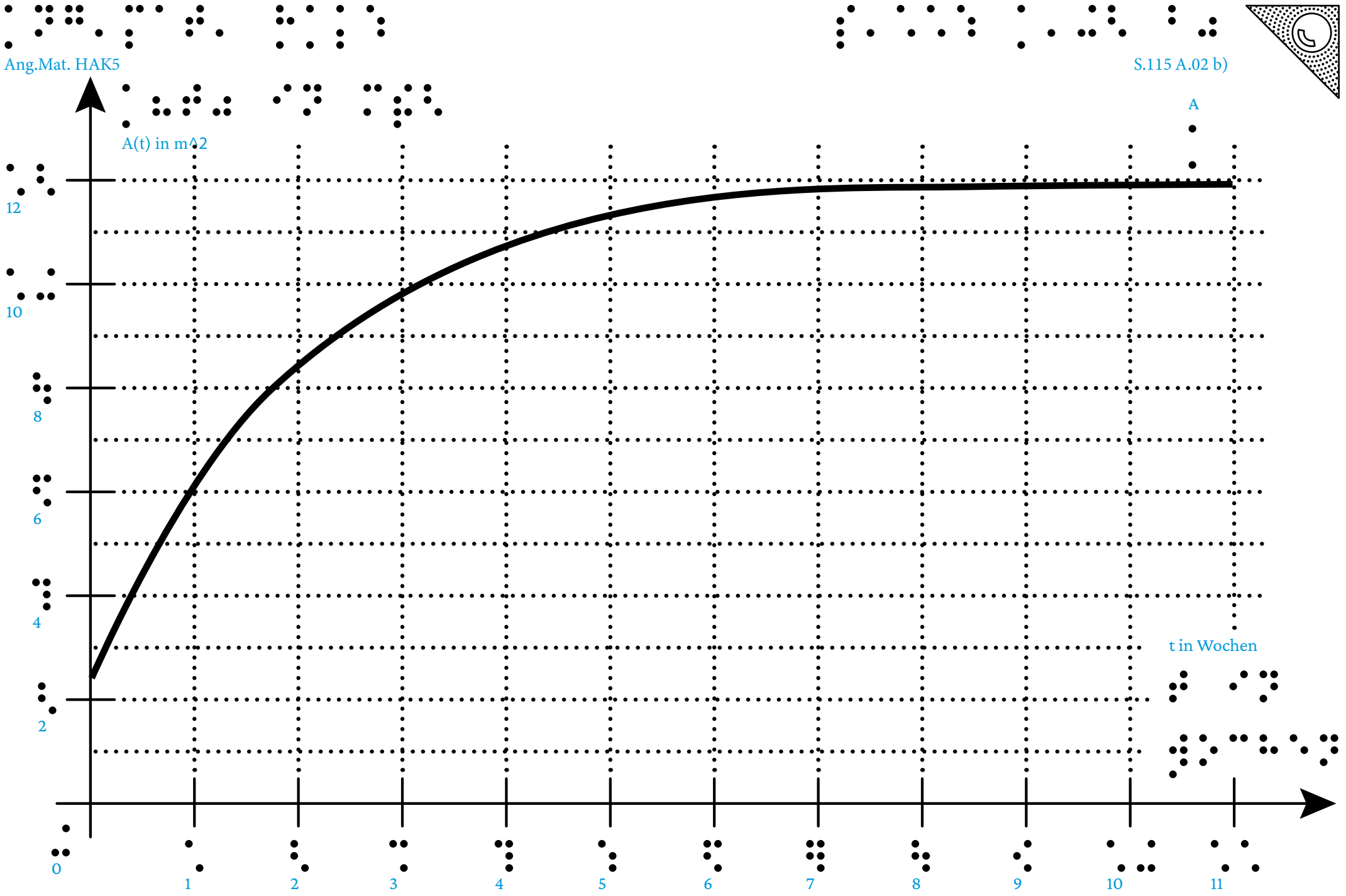
Angewandte Mathematik
HAK Band 5

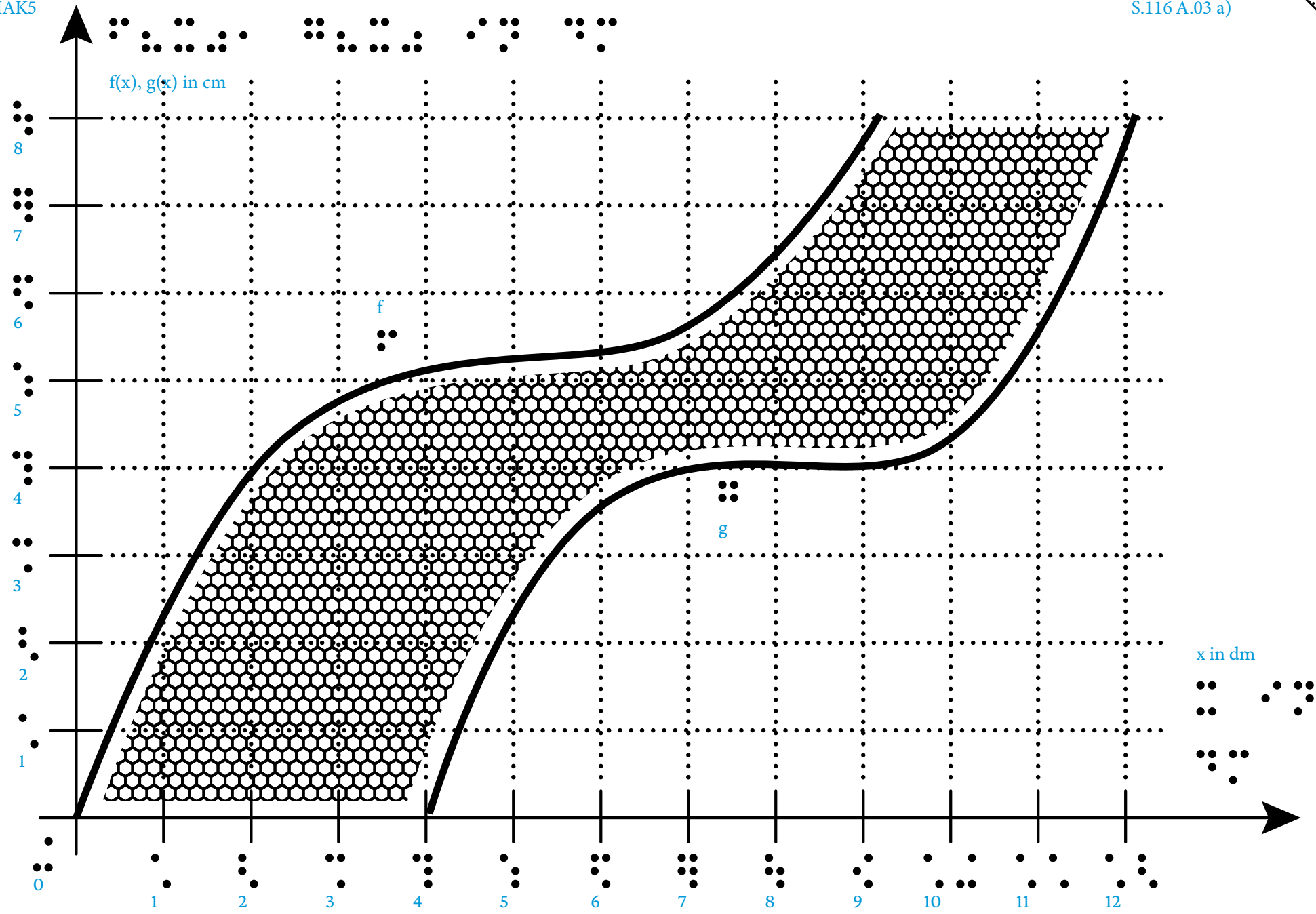
4.

Vermischte Aufgaben für die SRDP

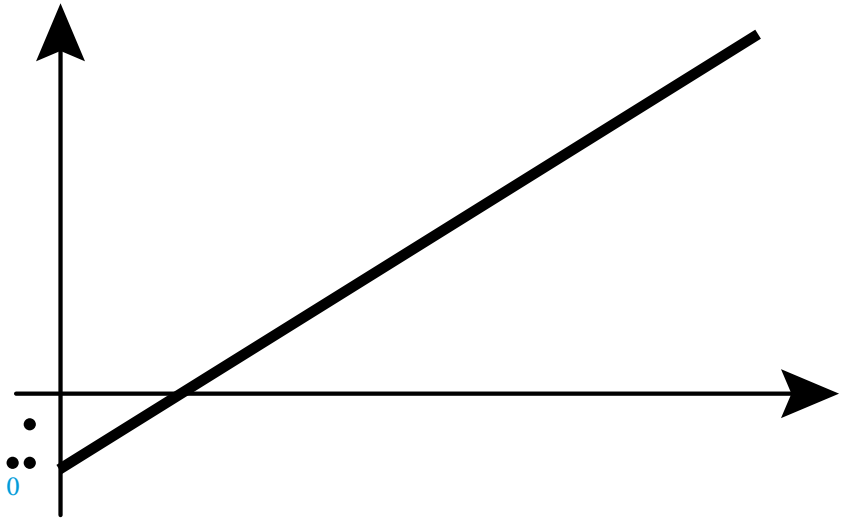

s(t) in m
300
250
200
150
100
50
0
s
t in s
2
4
6
8
10
12
14
16
18
20
22
24
26


f(x) in m
2
f
x in m
0
1

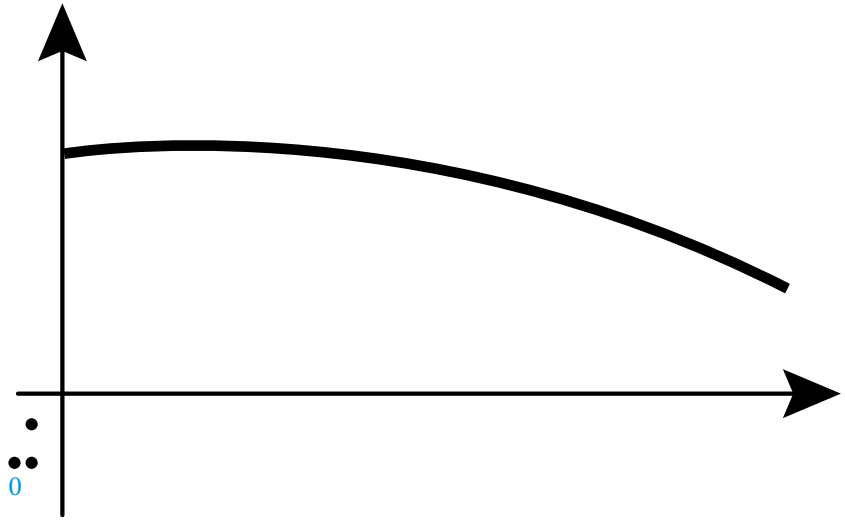

A
A(t) in m^2
12
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
11
t in Wochen


f(x), g(x) in cm
f
g
x in dm
0
1
2
3
4
5
6
7
8
9
10
11
12

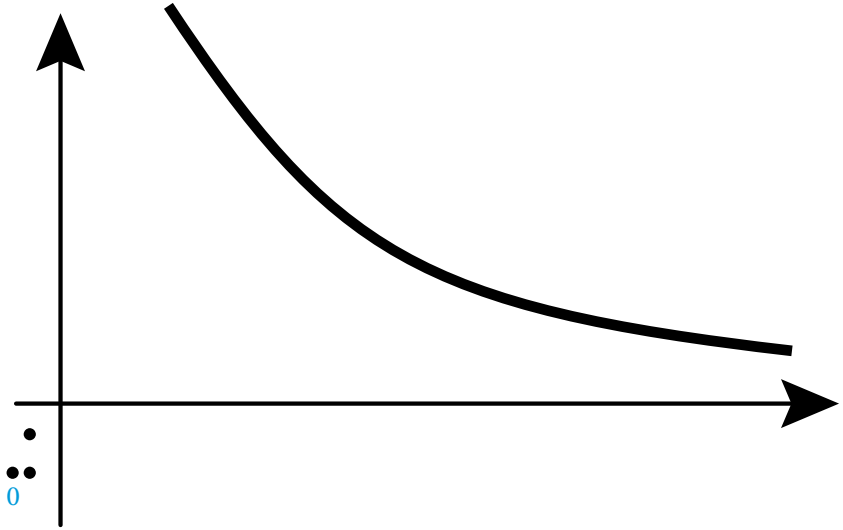
A



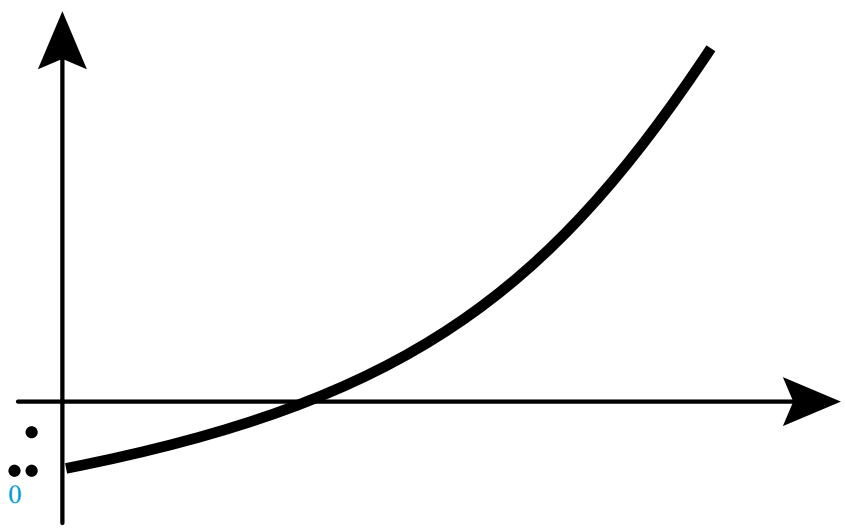
B

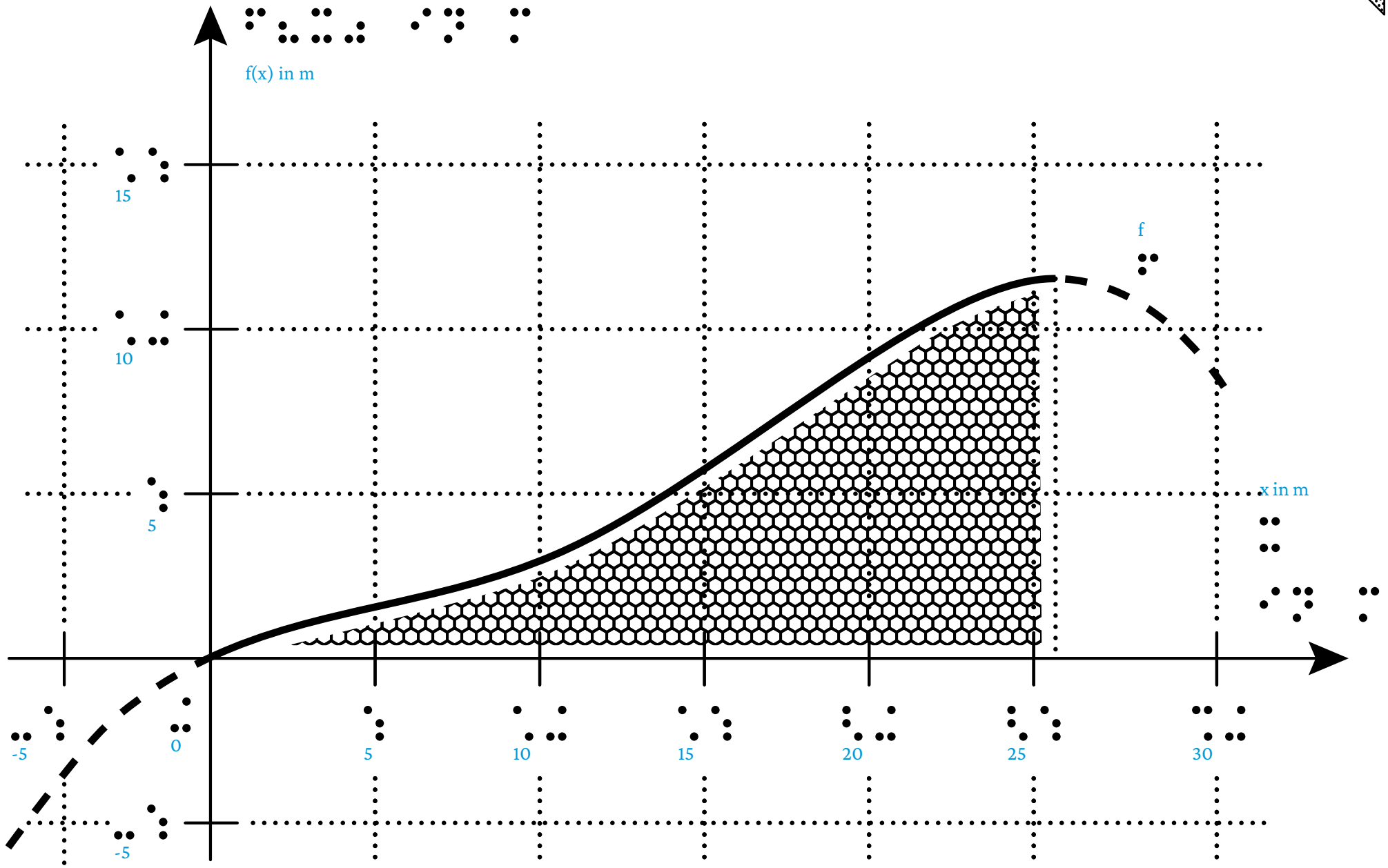


C

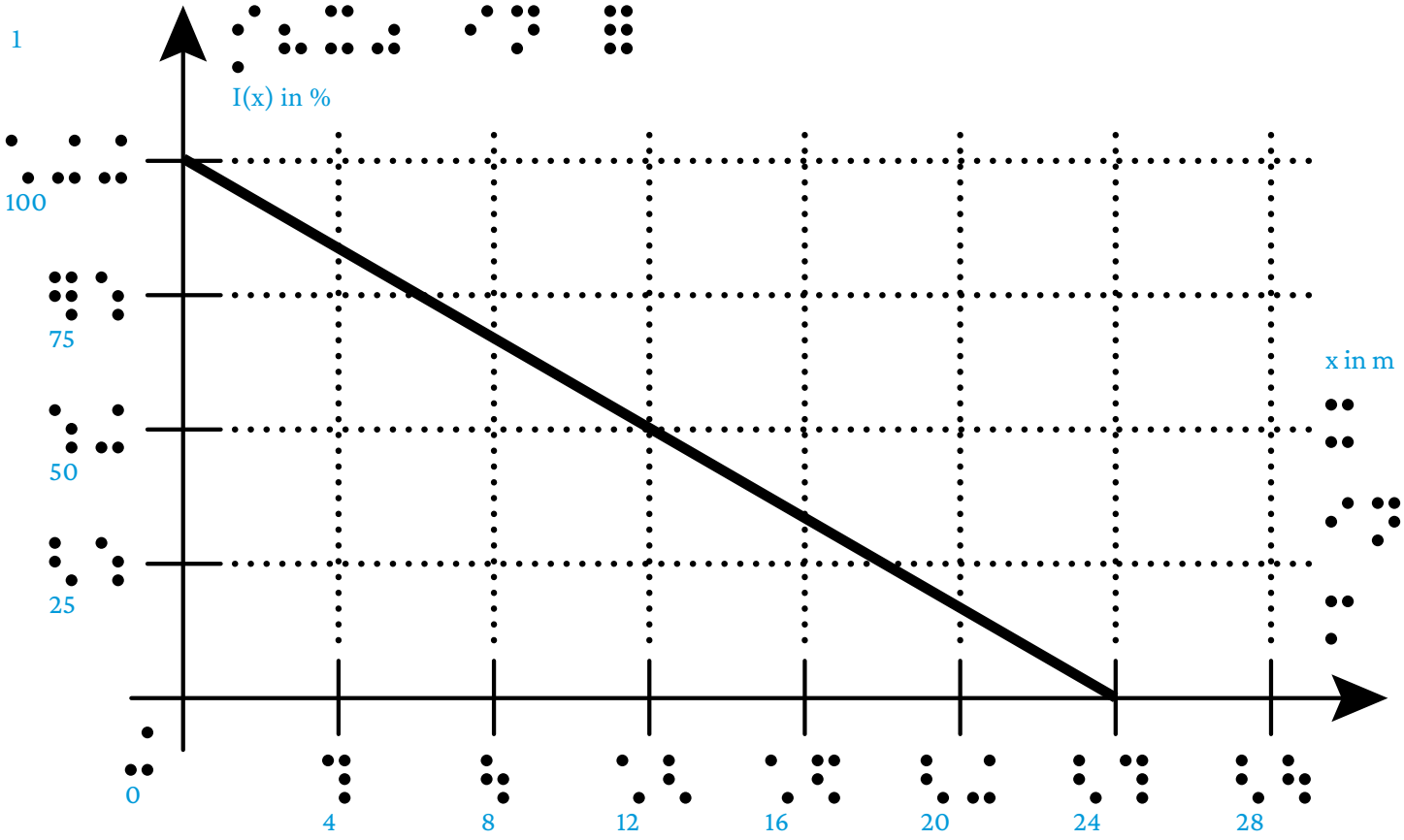


D

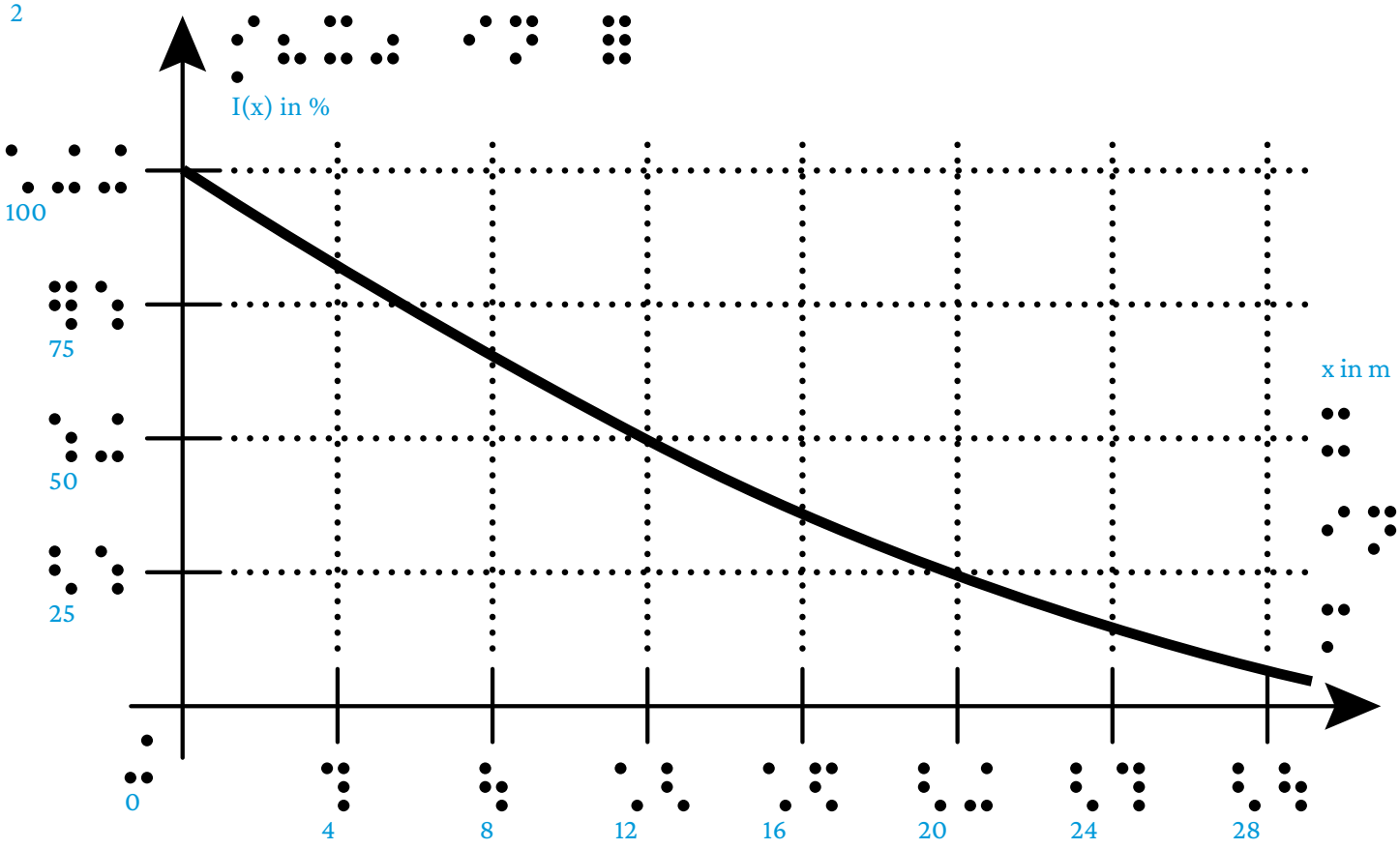



f(x) in m
15
10
5
-5
f
x in m
-5
0
5
10
15
20
25
30

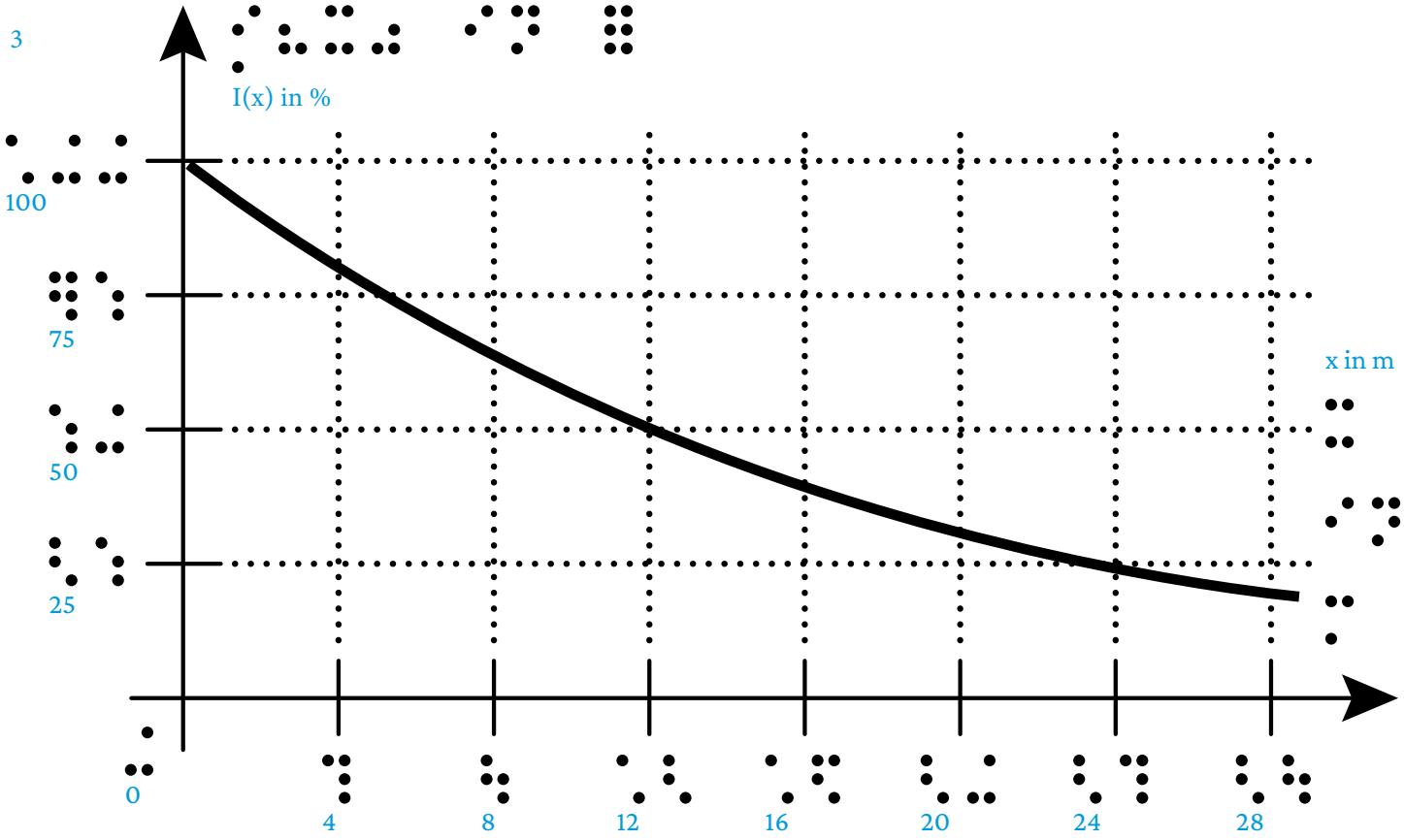
1


I(x) in %
100
75
50
25
0
4
8
12
16
20
24
28
x in m

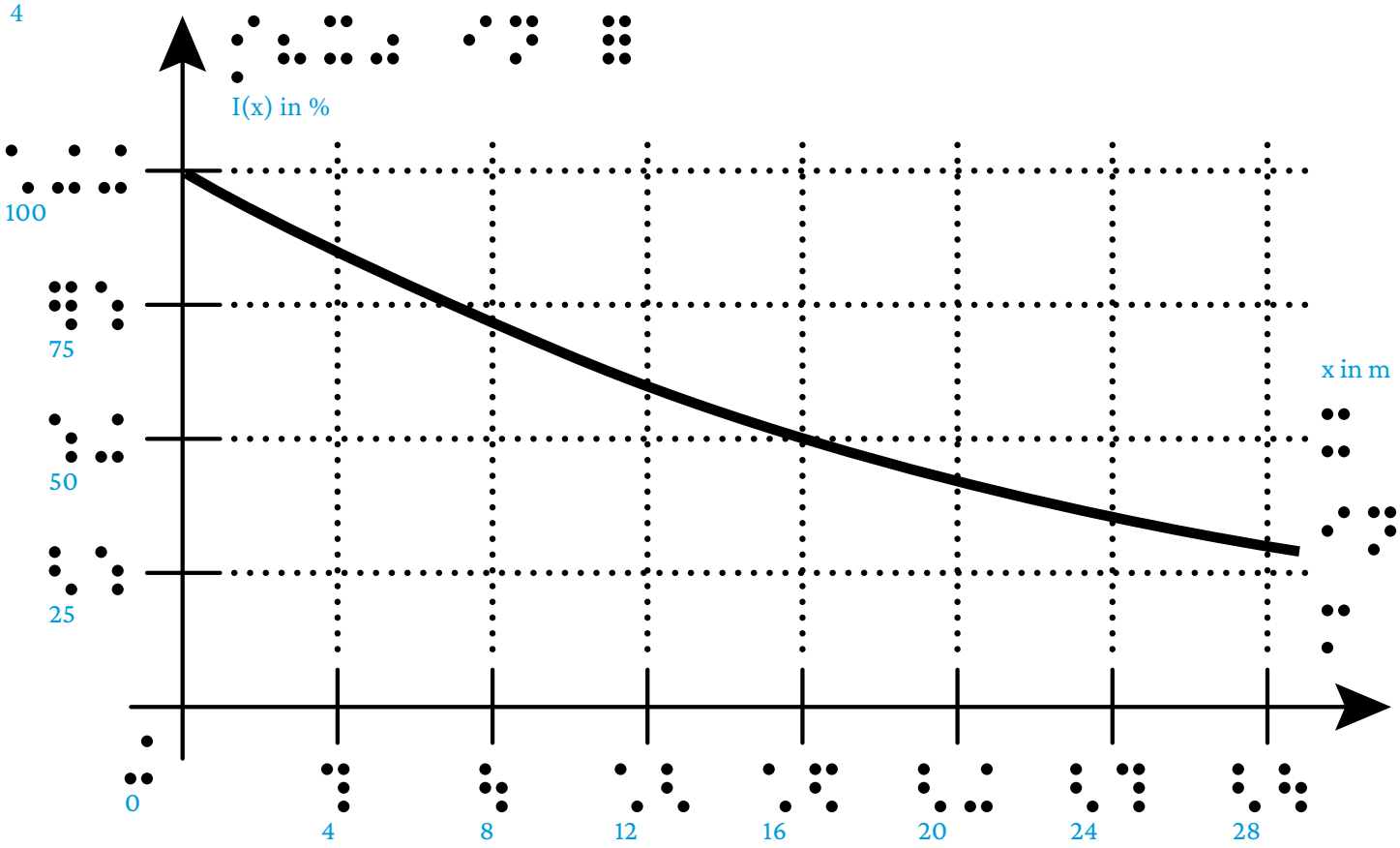
2


I(x) in %
100
75
50
25
0
4
8
12
16
20
24
28
x in m

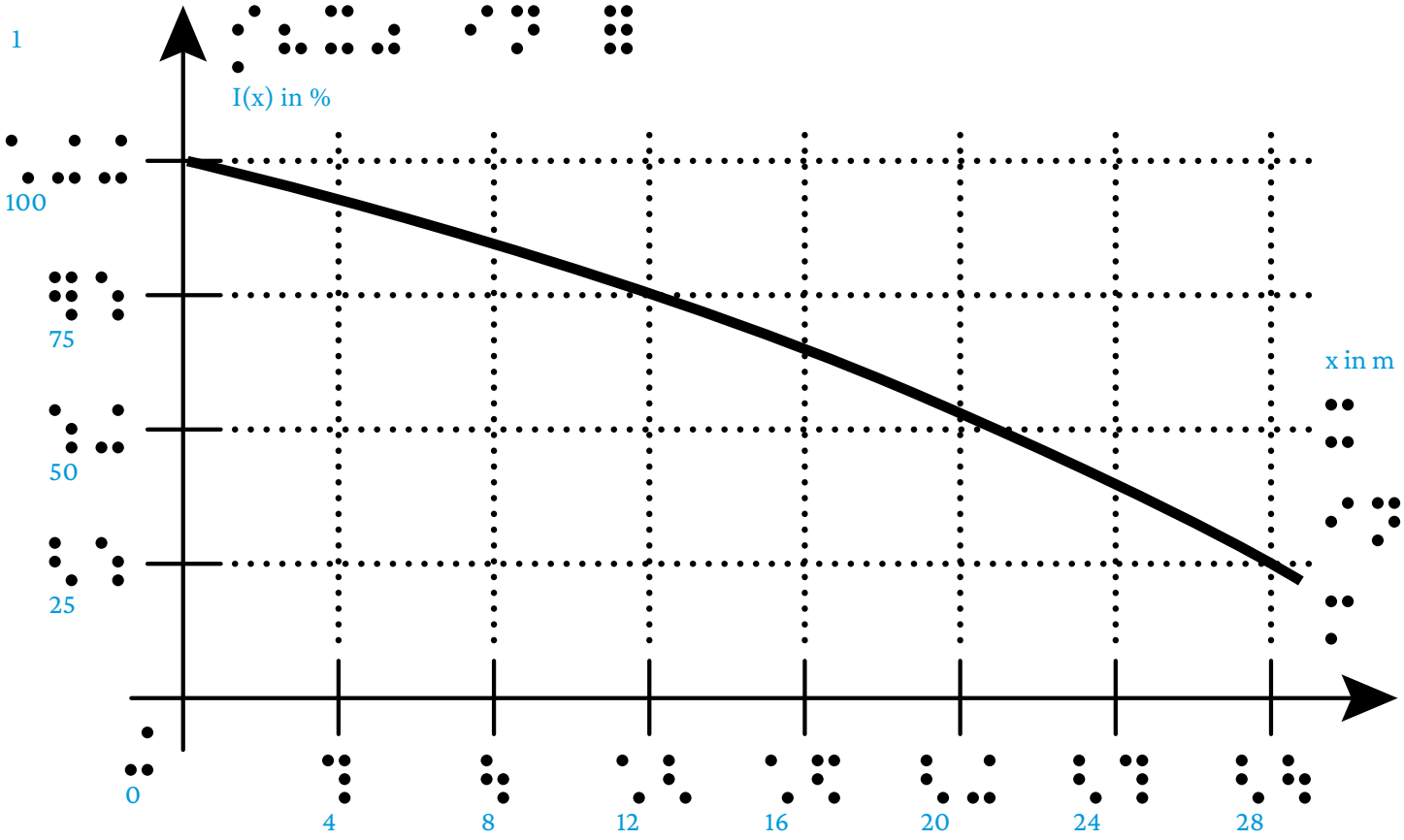
3

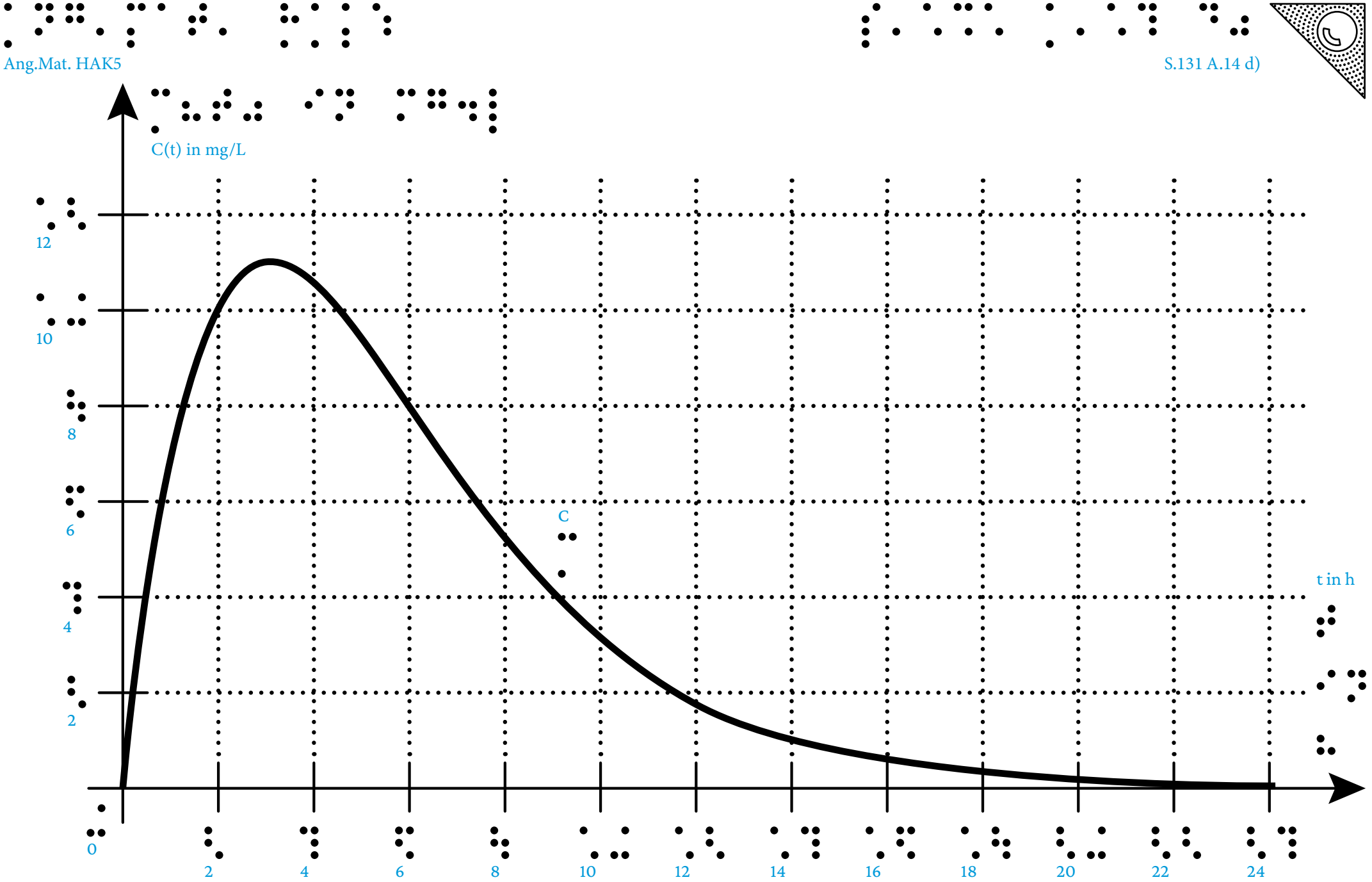

I(x) in %
100
75
50
25
0
4
8
12
16
20
24
28
x in m

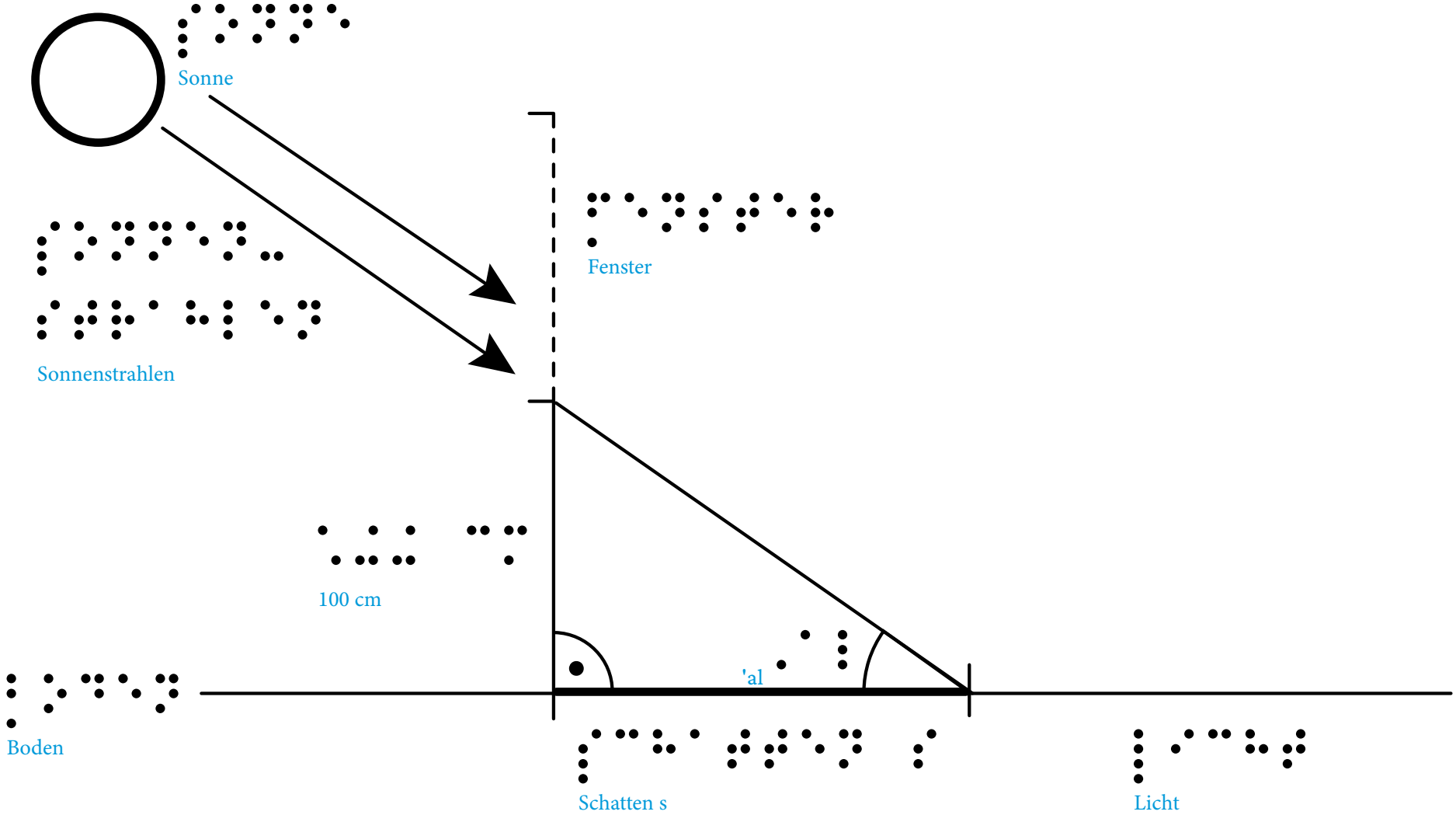
4

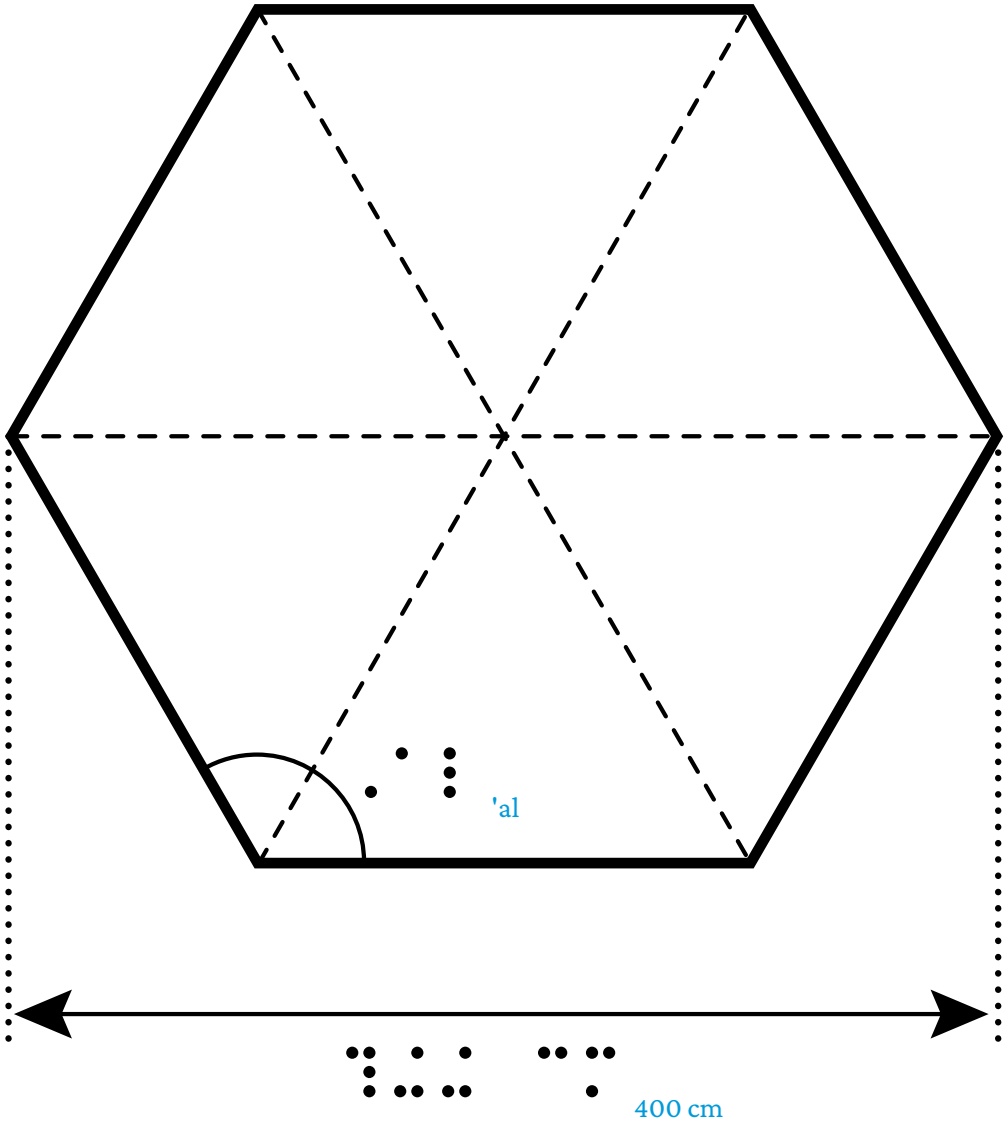

I(x) in %
100
75
50
25
0
4
8
12
16
20
24
28
x in m

1




C(t) in mg/L
12
10
8
6
4
2
0
C
t in h
2
4
6
8
10
12
14
16
18
20
22
24


Sonne
Fenster
Sonnenstrahlen
100 cm
'al
Boden
Schatten s
Licht


'al
400 cm