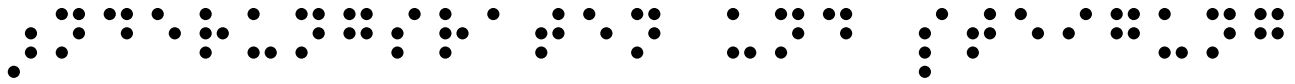
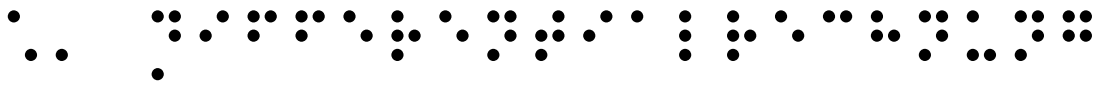


Ang.Mat. HAK4

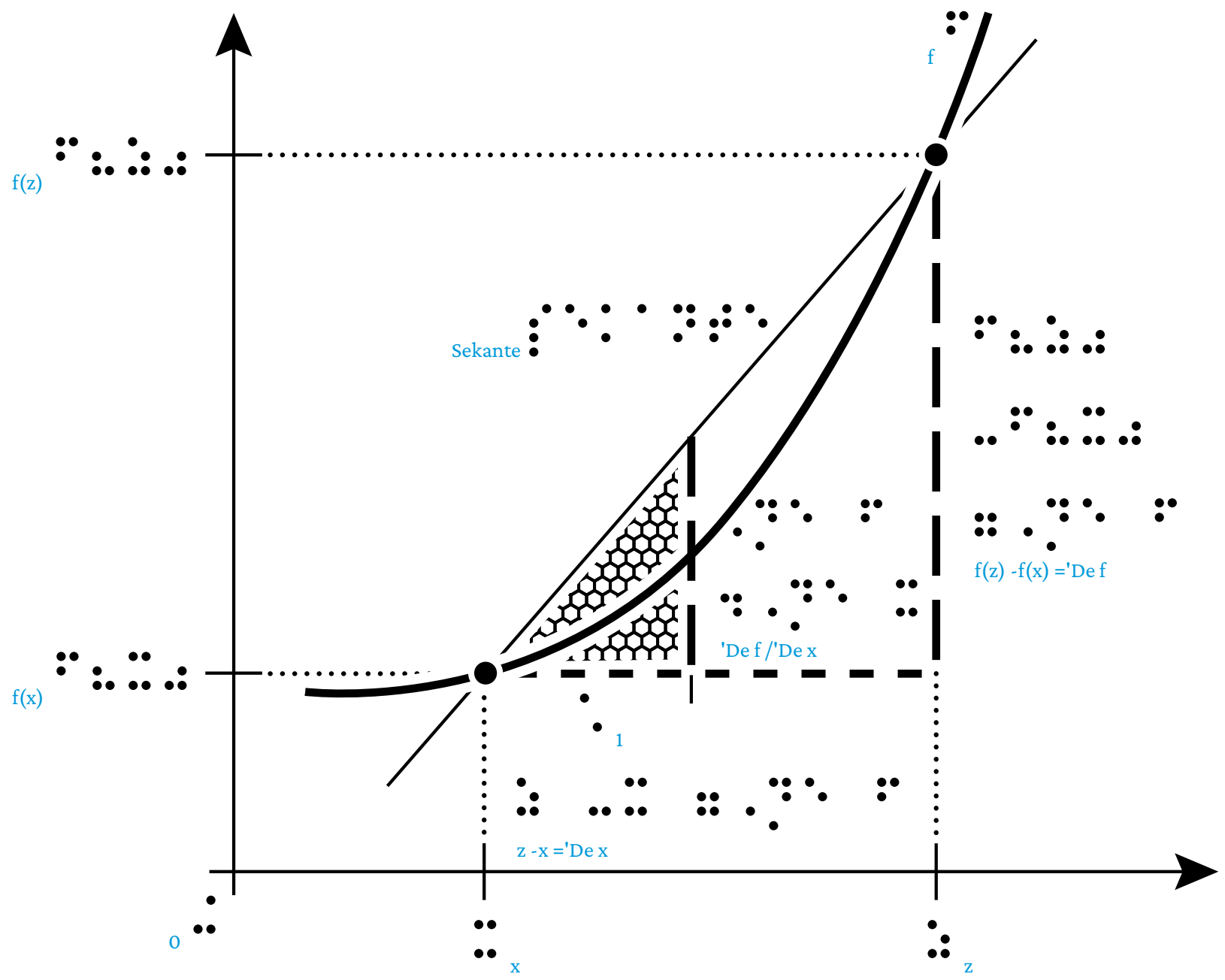
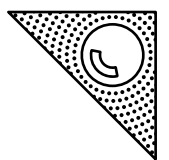


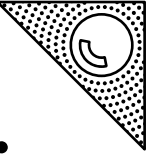
1. Differentialrechnung, Änderungsraten und Steigung

Angewandte Mathematik HAK Band 4

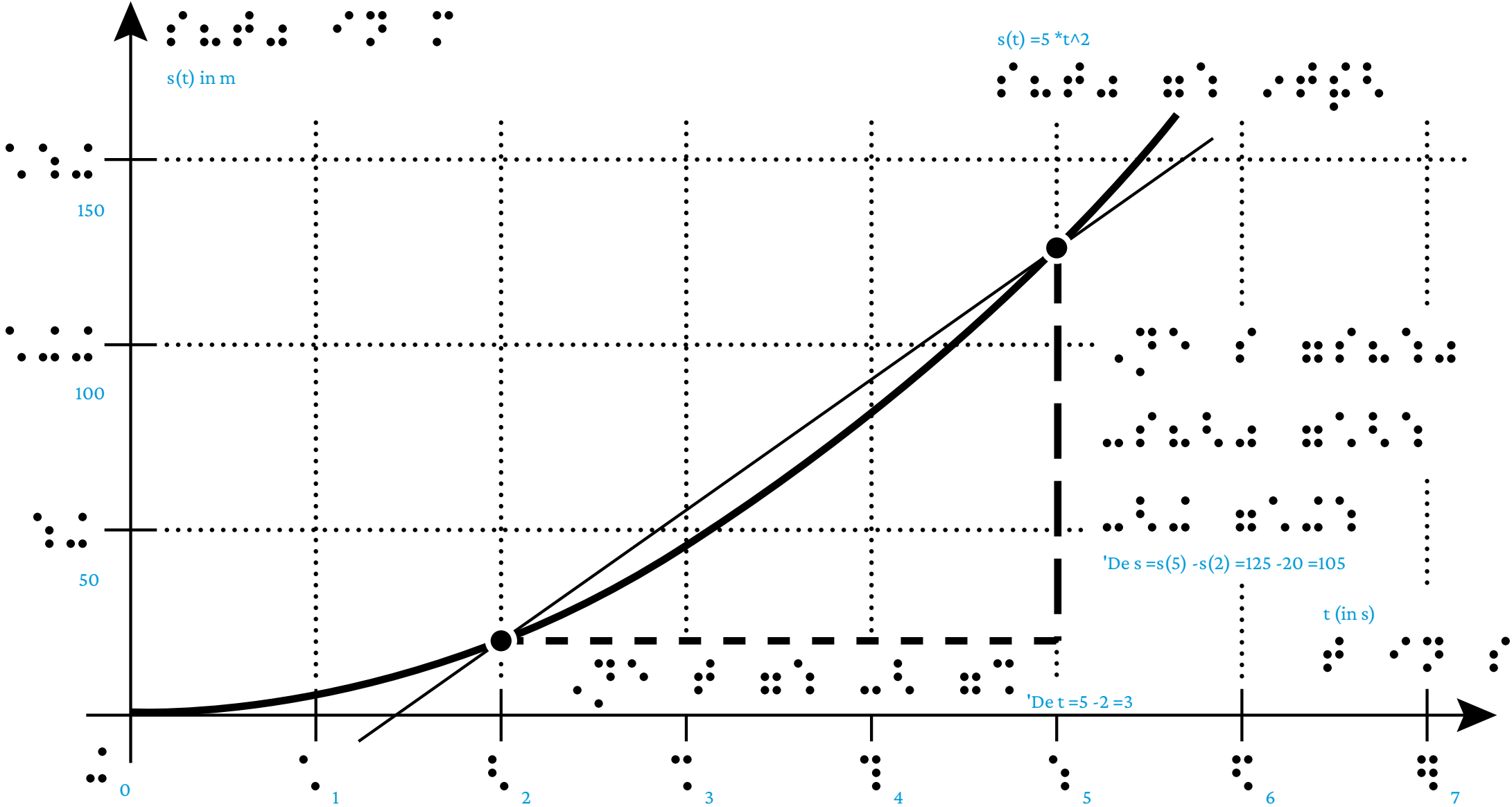
1.

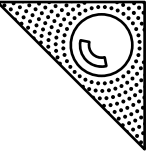
Differentialrechnung Änderungsraten und Steigung





Mittl. Geschwindigkeit im Zeitint. [2;5]

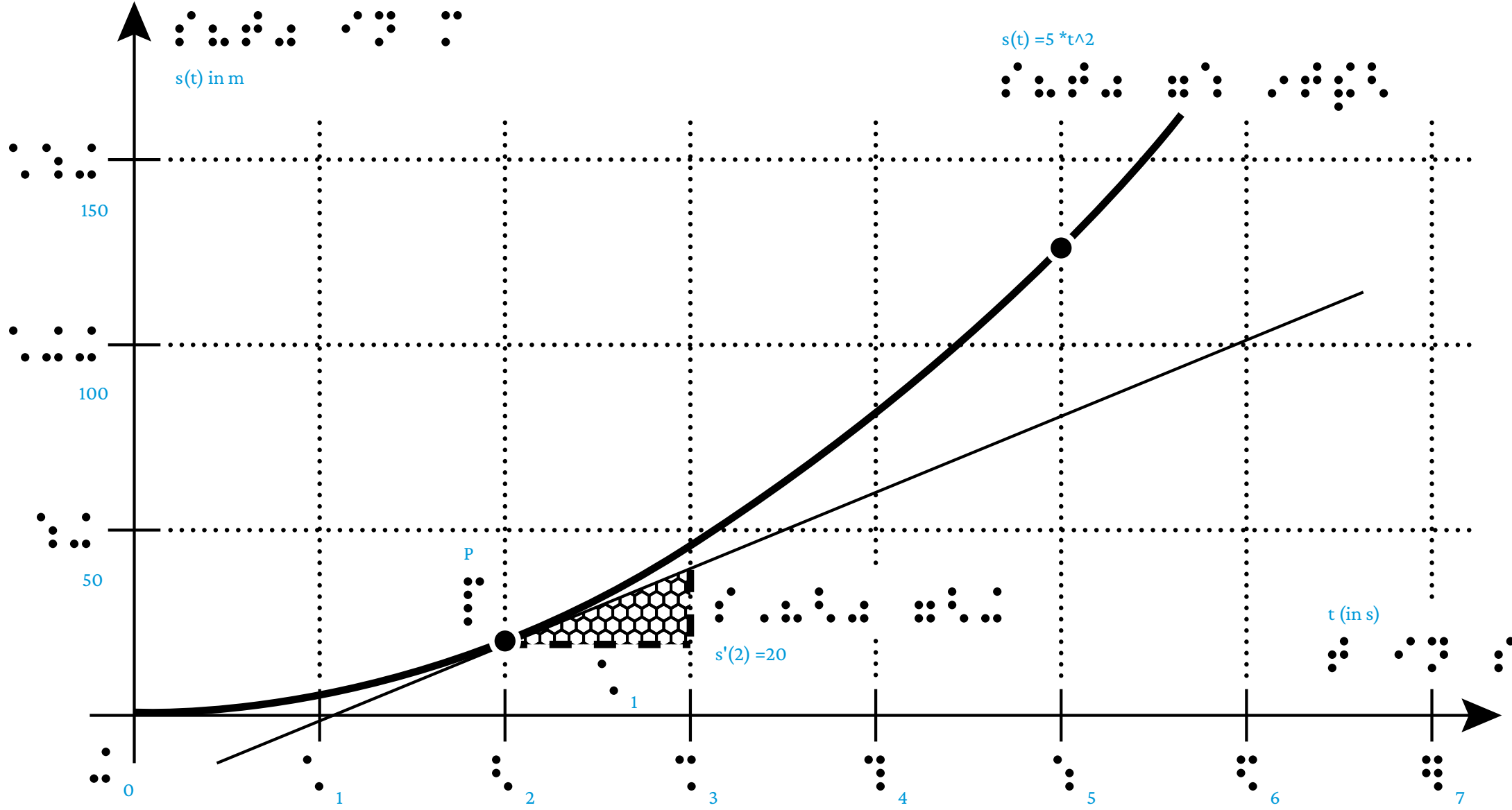




Momentangeschwindigkeit zum Zeitpunkt 2

$s(t)$ in m

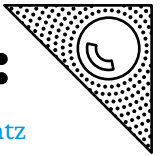
$$s(t) = 5 \cdot t^2$$



$$s'(2) = 20$$

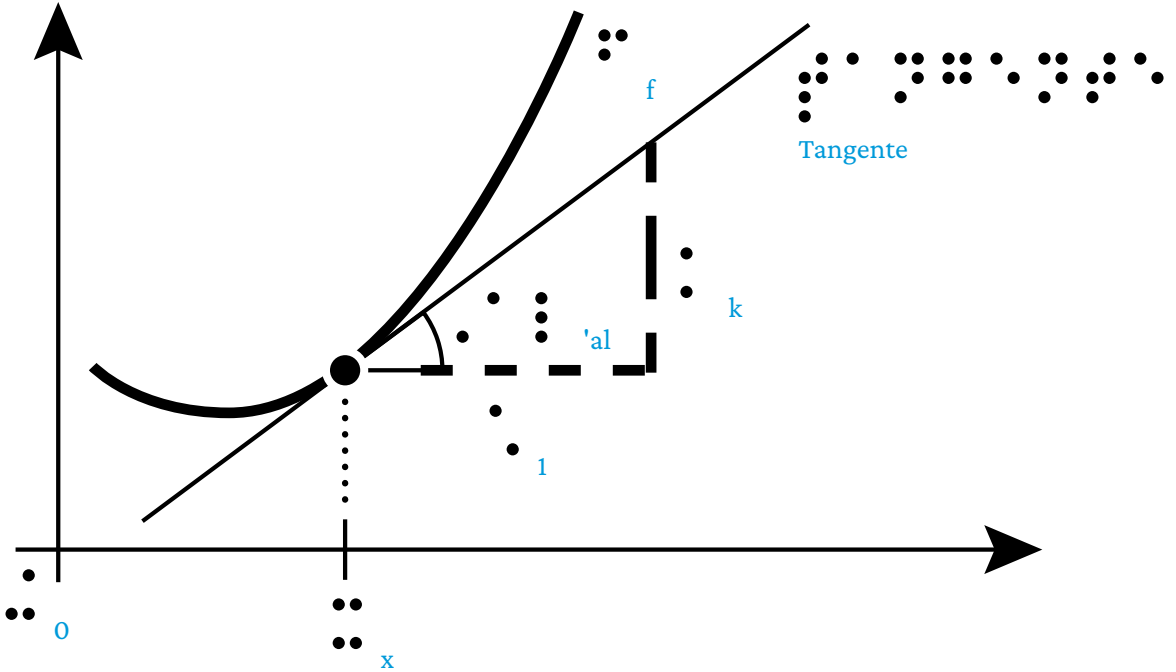
1

t (in s)

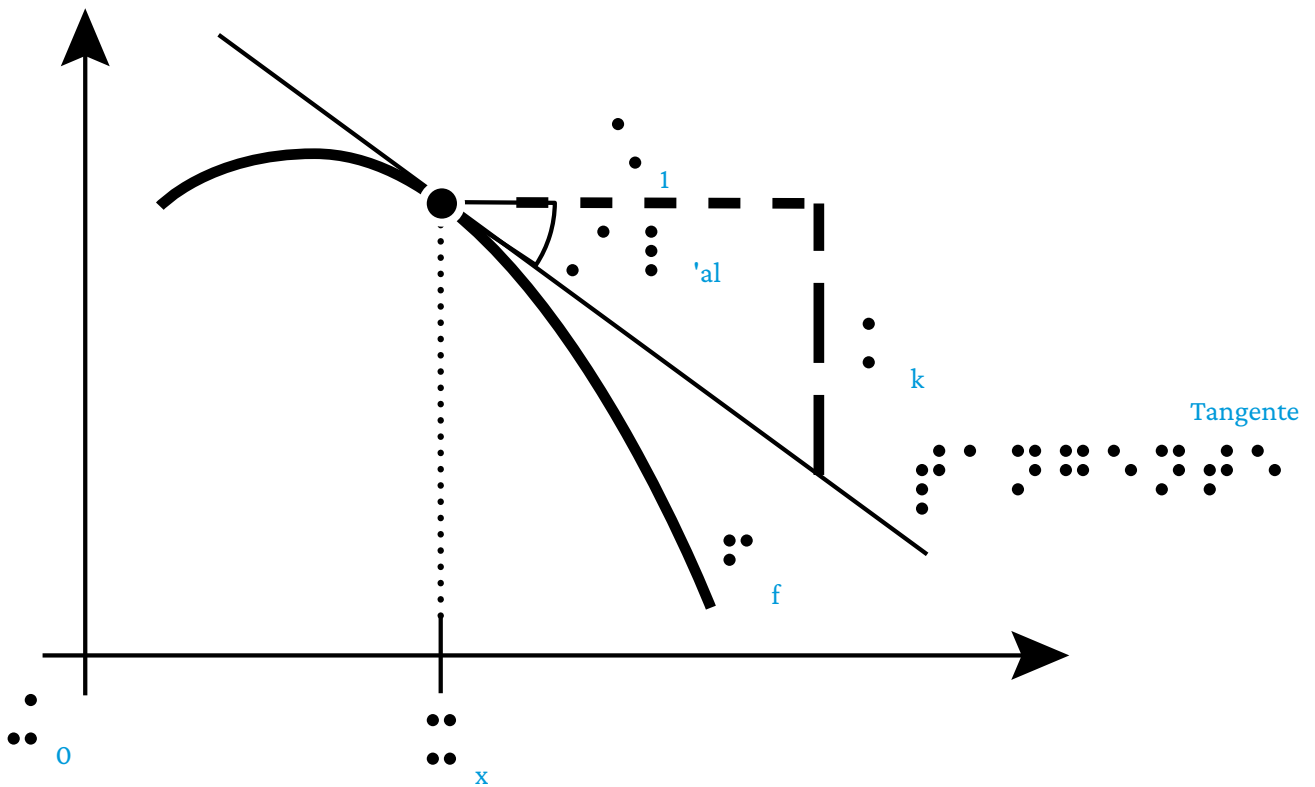


$$f'(x) = k = \tan(\alpha)$$

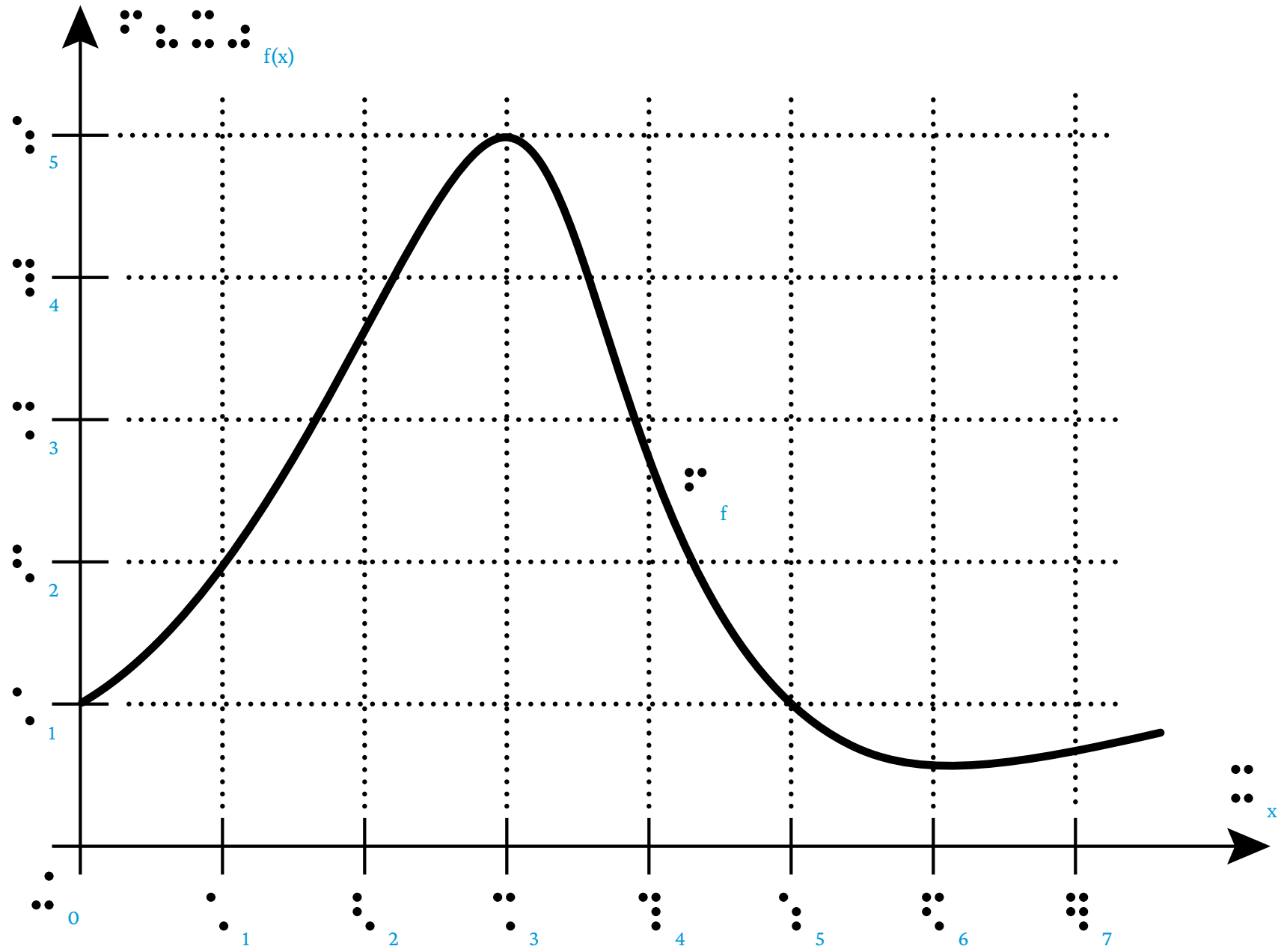
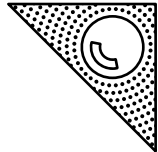
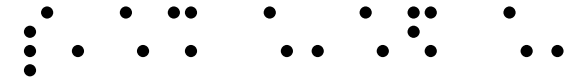
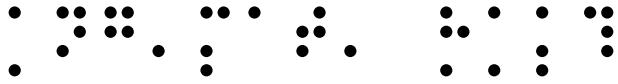
$$\alpha = \arctan(k) = \arctan(f'(x))$$

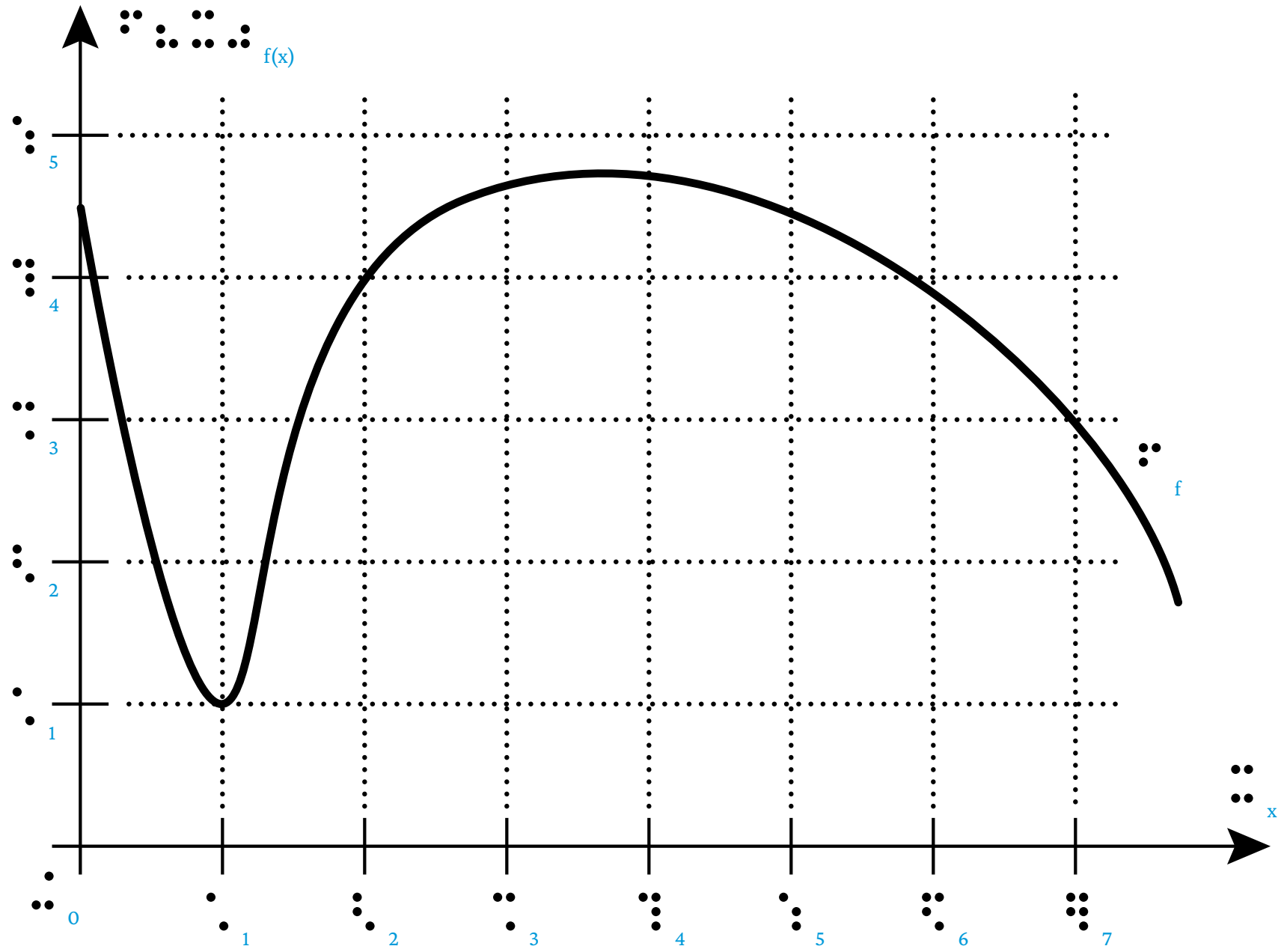
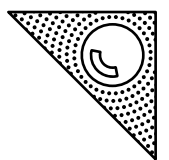


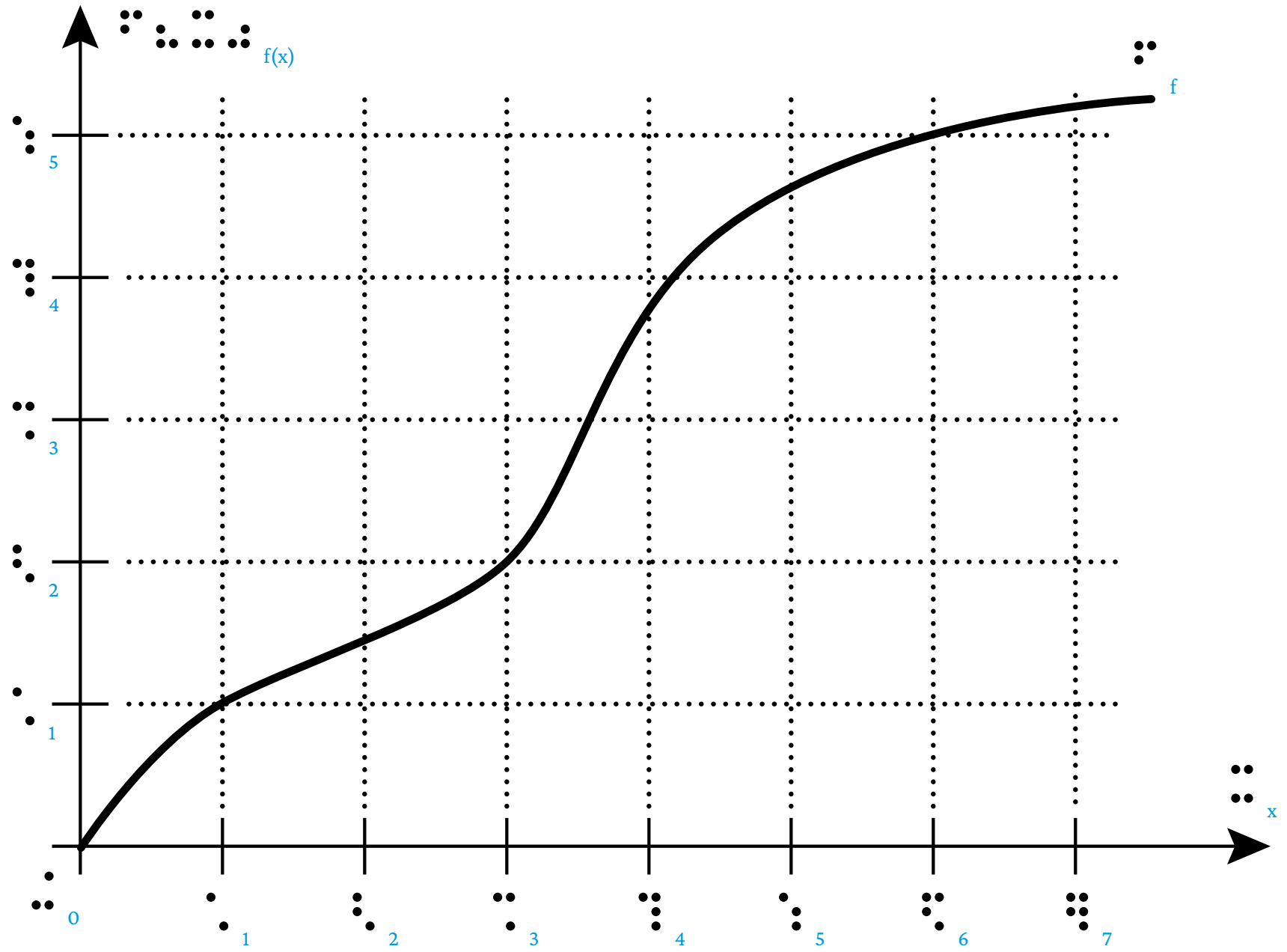
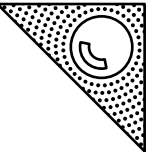
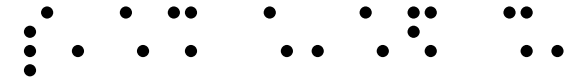
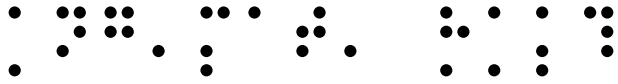
positive Steigung: $k > 0, \alpha > 0$

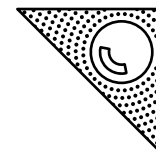
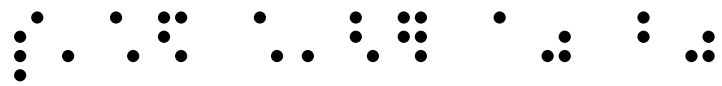
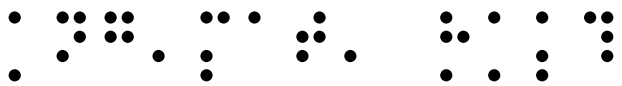


negative Steigung: $k < 0, \alpha < 0$

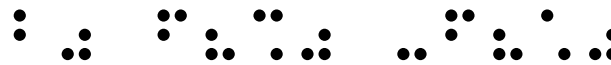




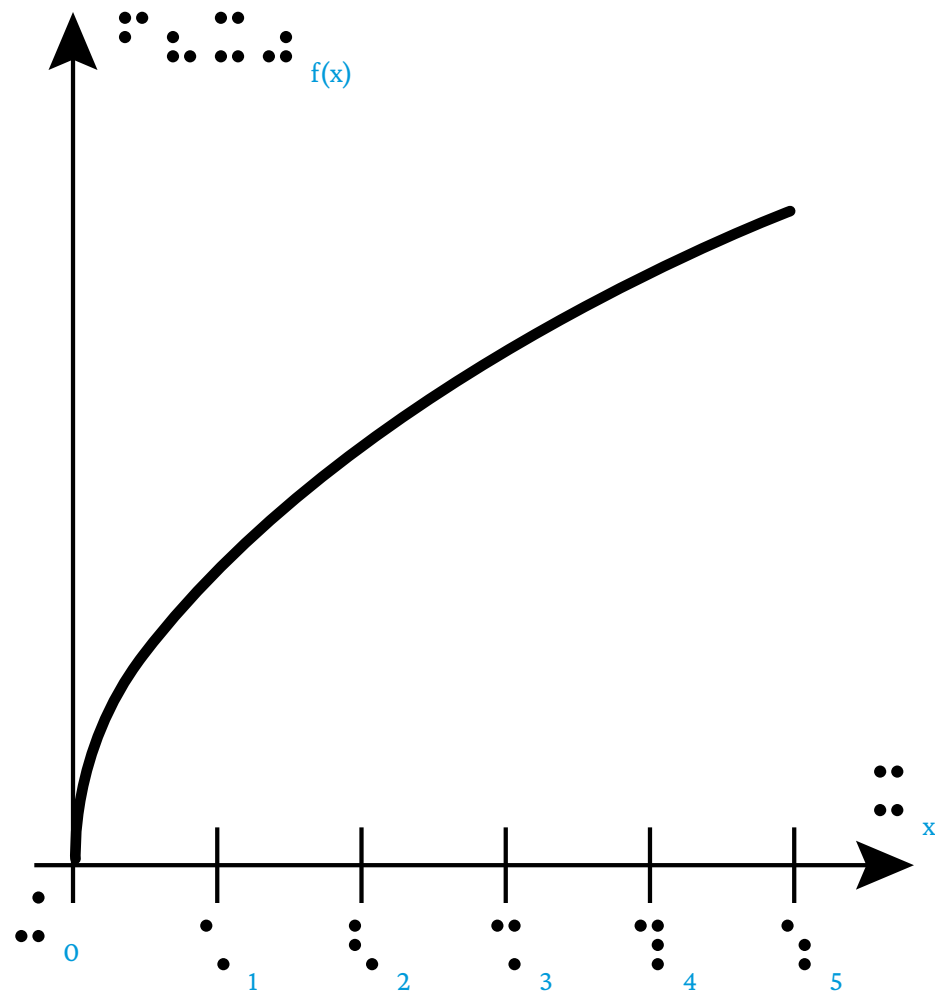
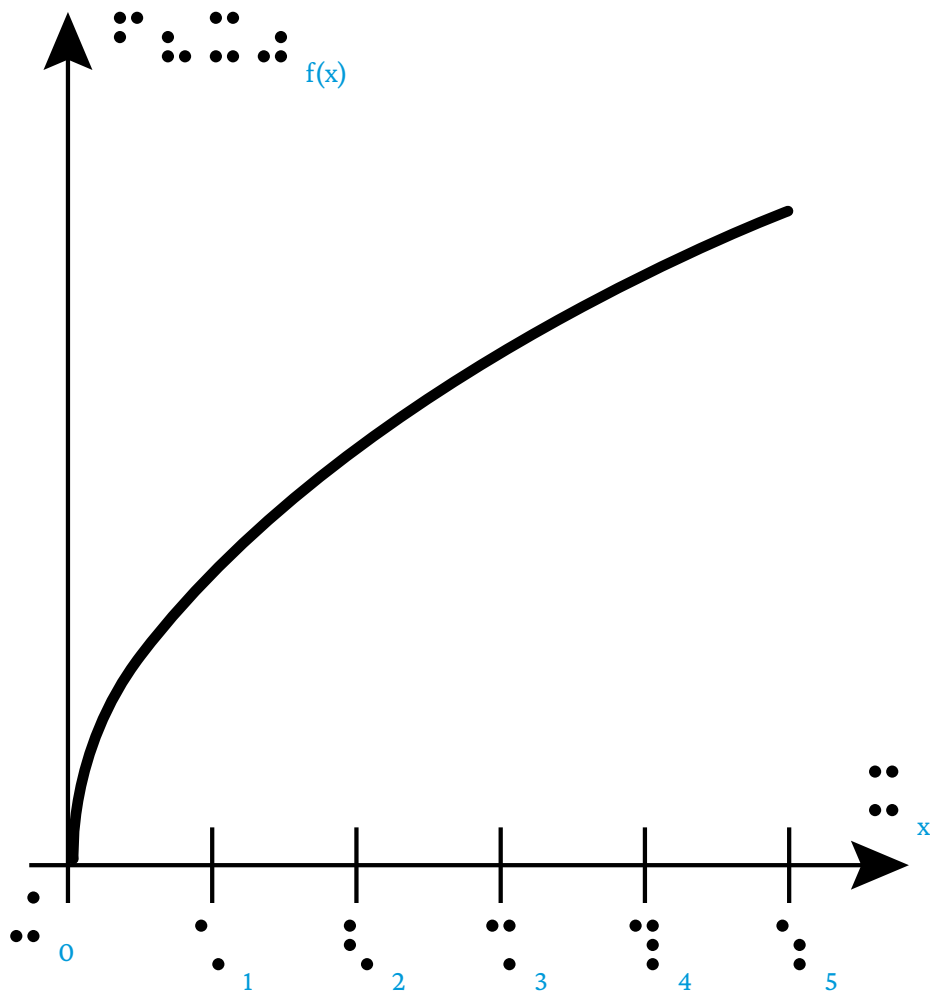


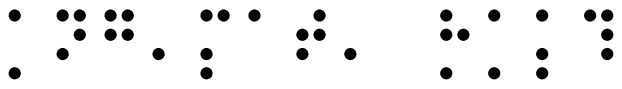


a) $f(2)$

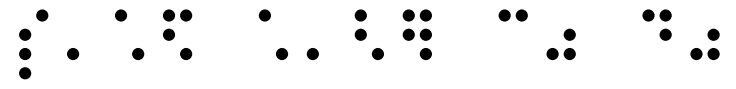


b) $f(3) - f(1)$

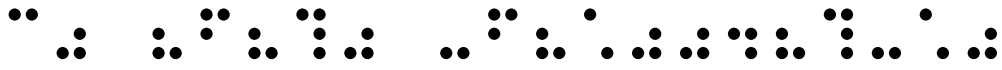
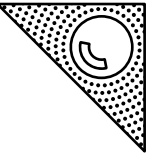




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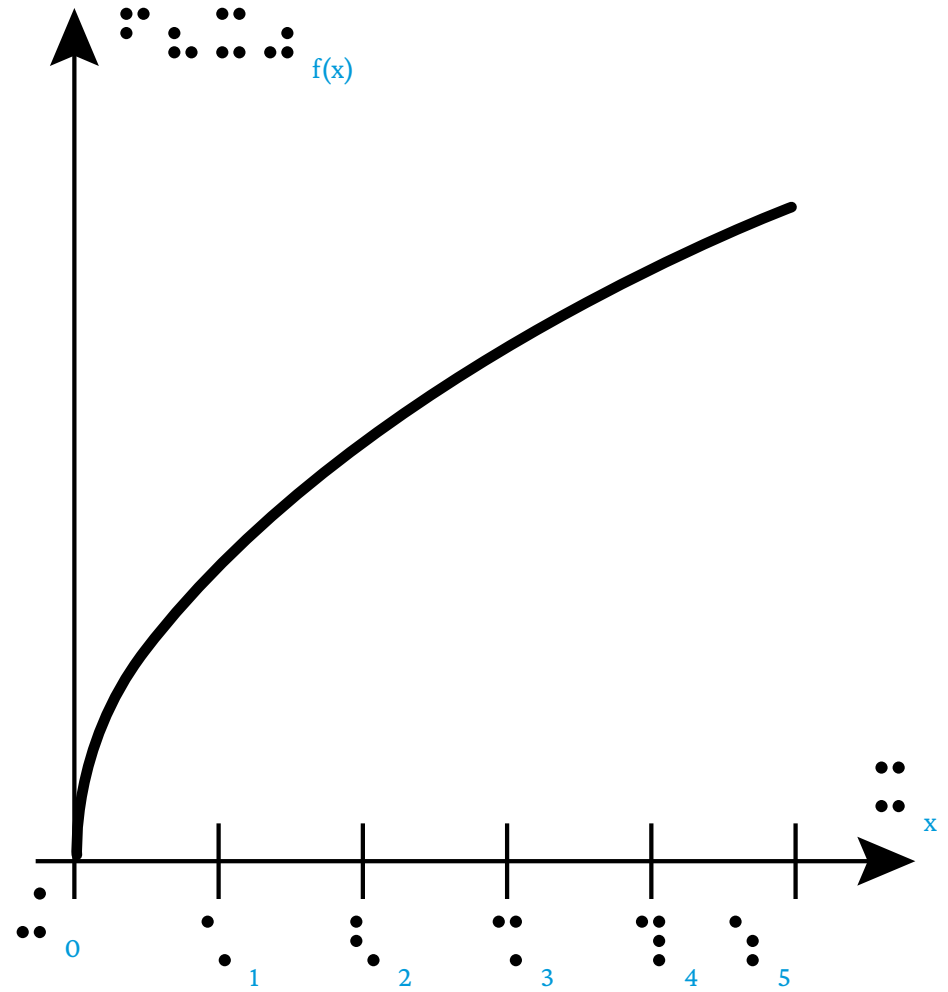
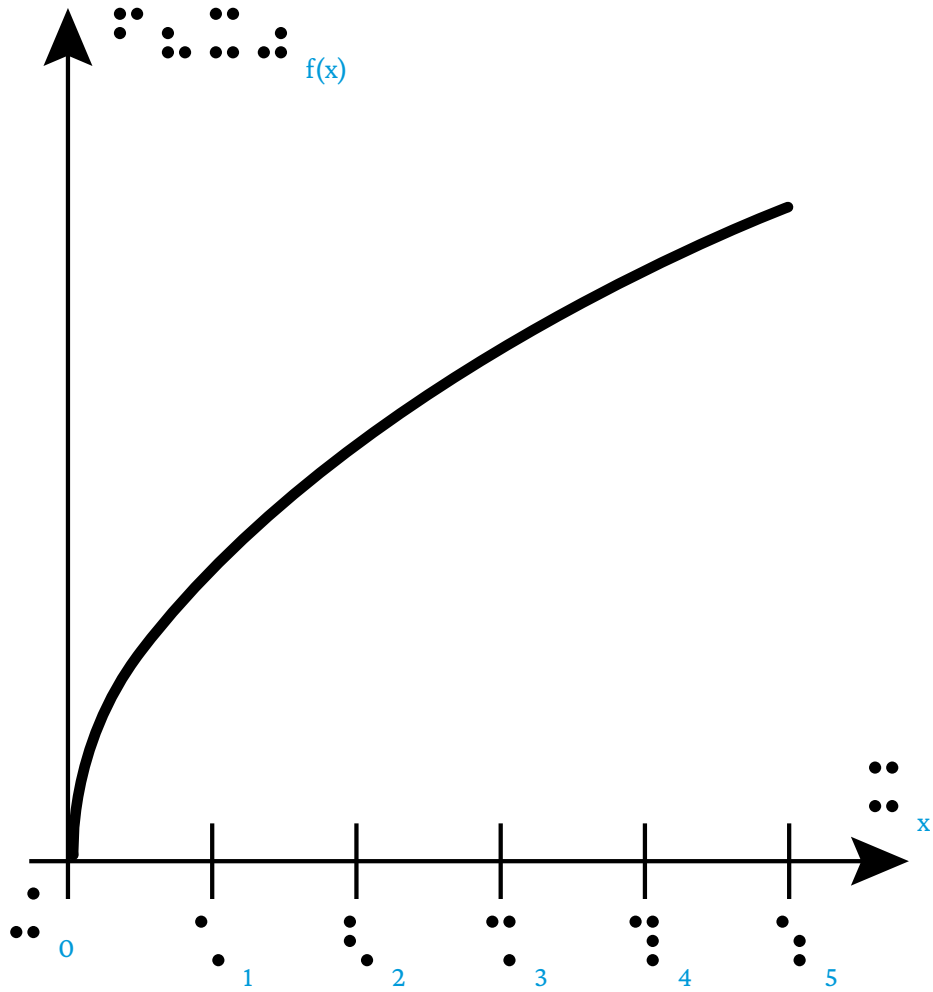
S.16 1.27 c) d)

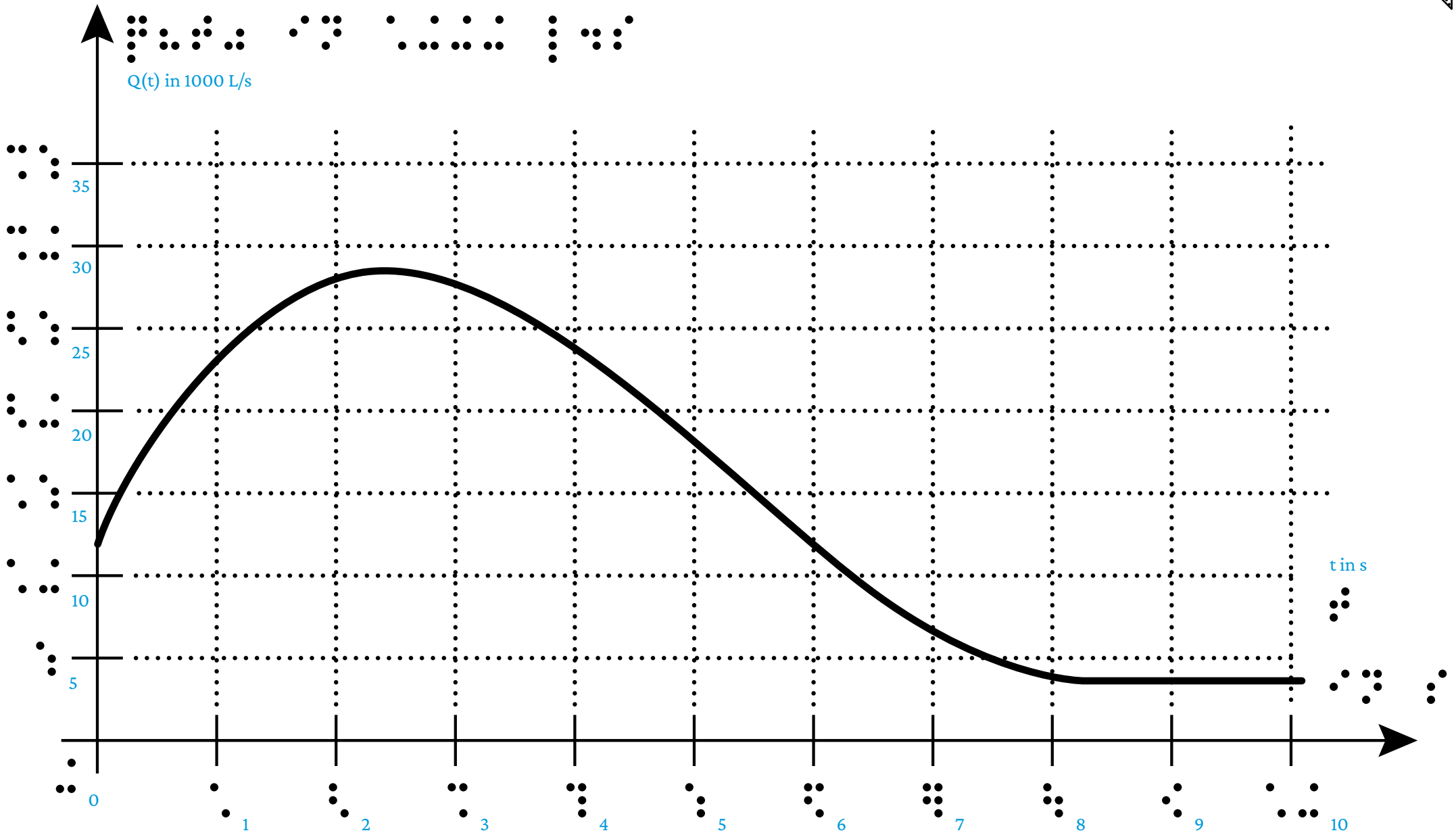
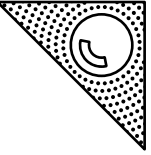


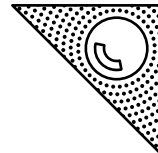
c) $(f(4) - f(1)) / (4 - 1)$



d) $f(1)$







• • • • • • • • • • • •

Ang.Mat. HAK4

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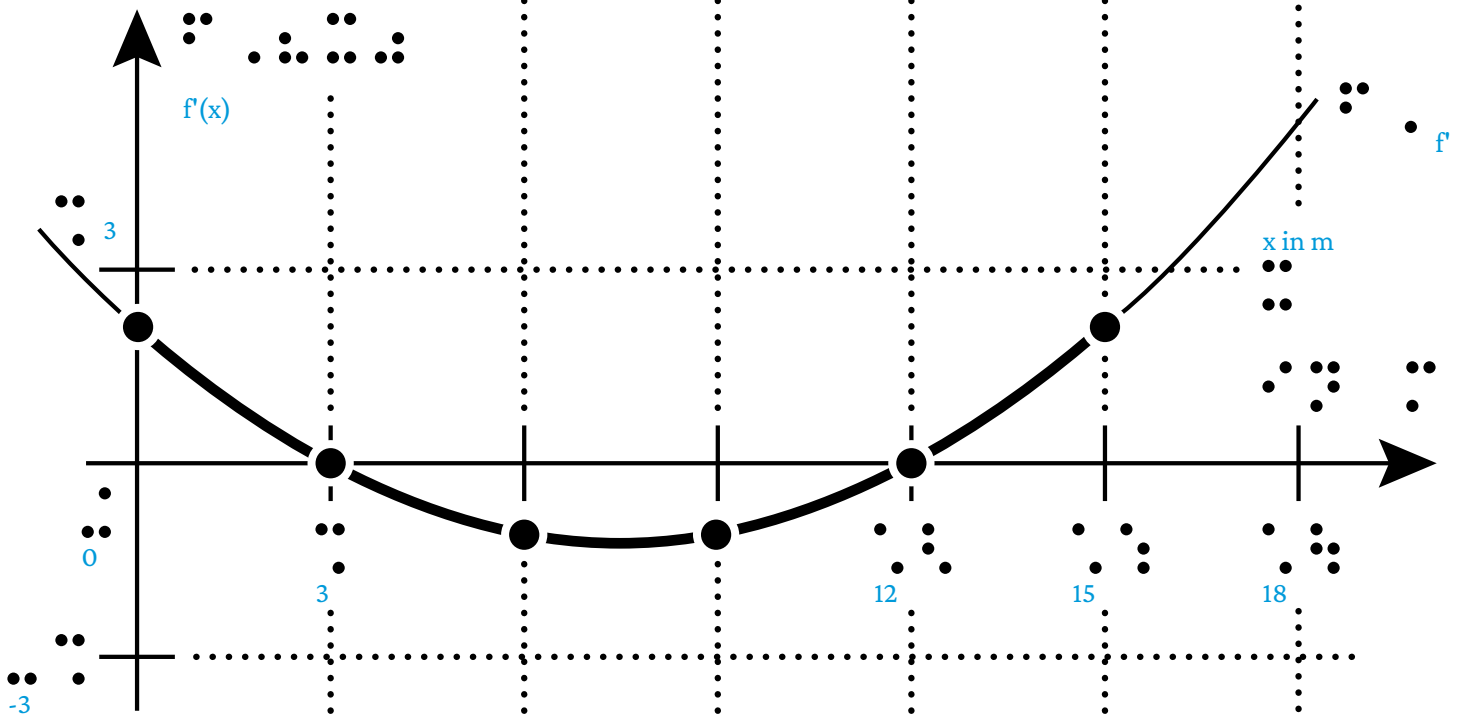
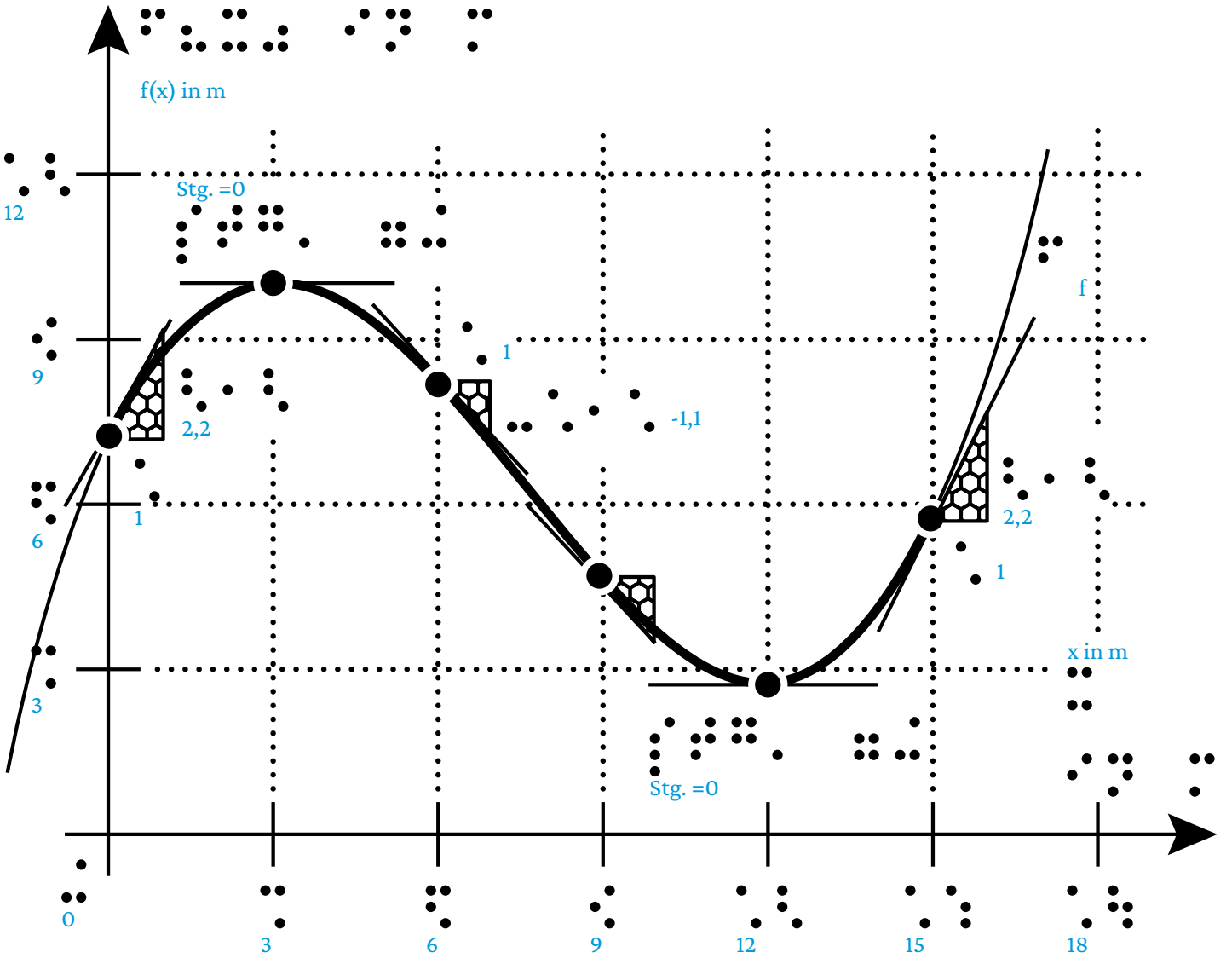
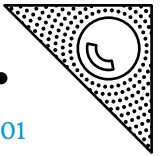
• • • • • • • • • • • • • •

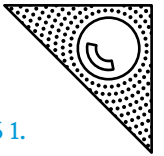
2. Funktionen und Ableitungsfunktionen

Angewandte Mathematik HAK Band 4

2.

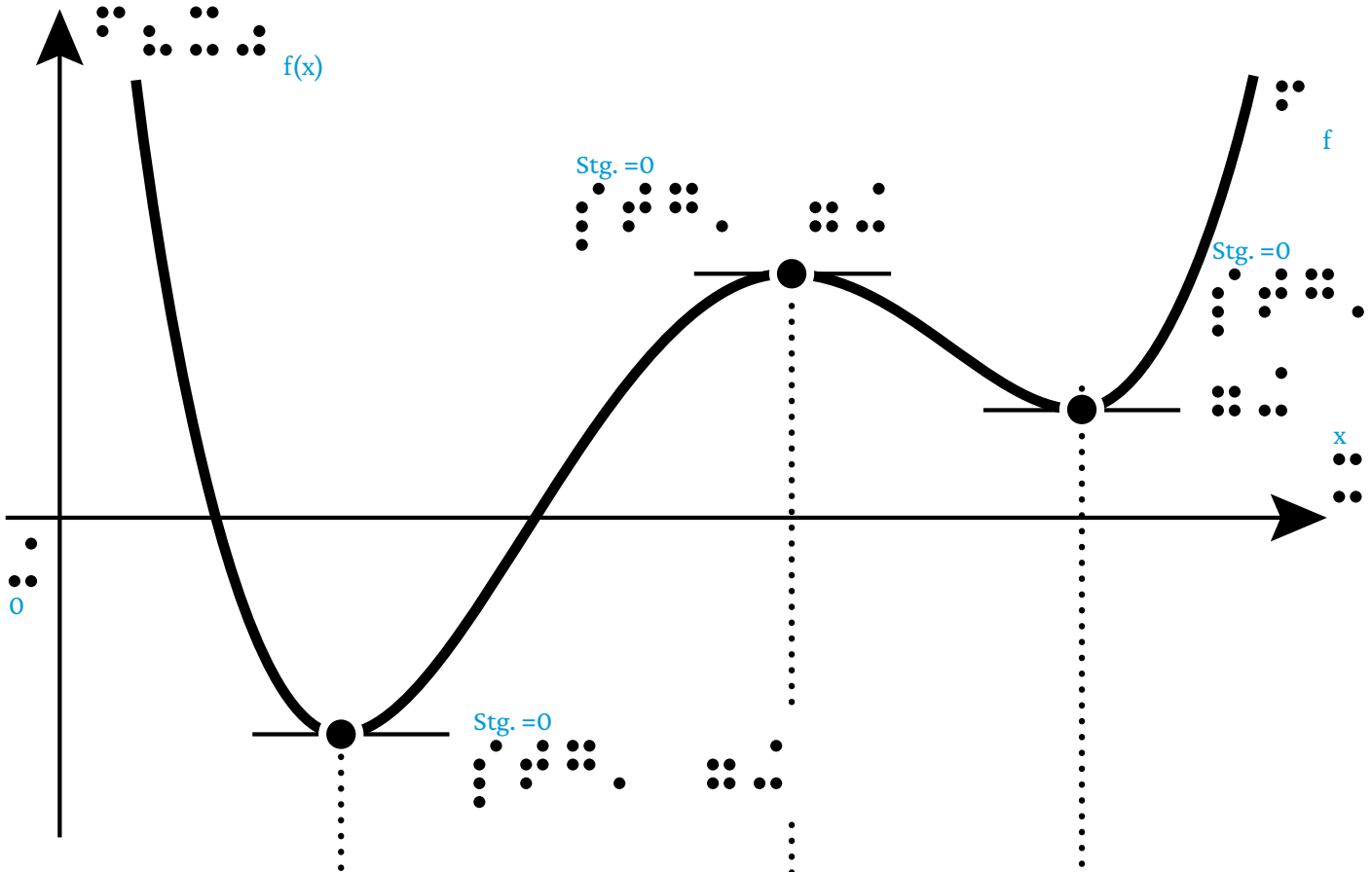
Funktionen und Ableitungsfunktionen



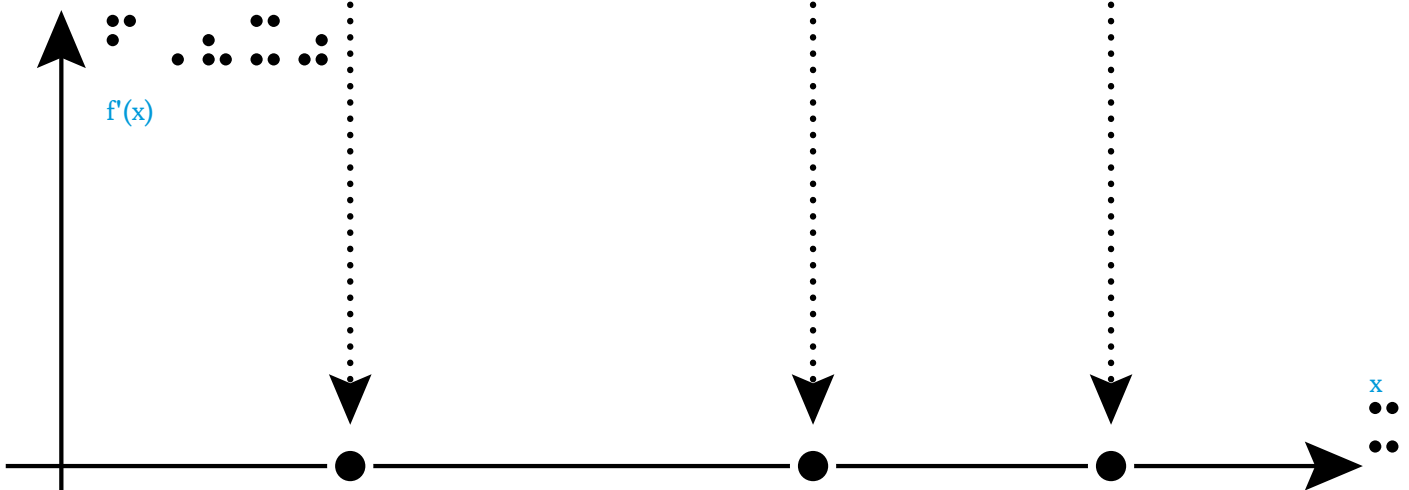


Grafisches Ableiten 1.

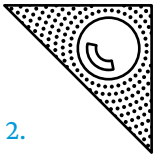
Funktion:



Ableitungsfunktion:

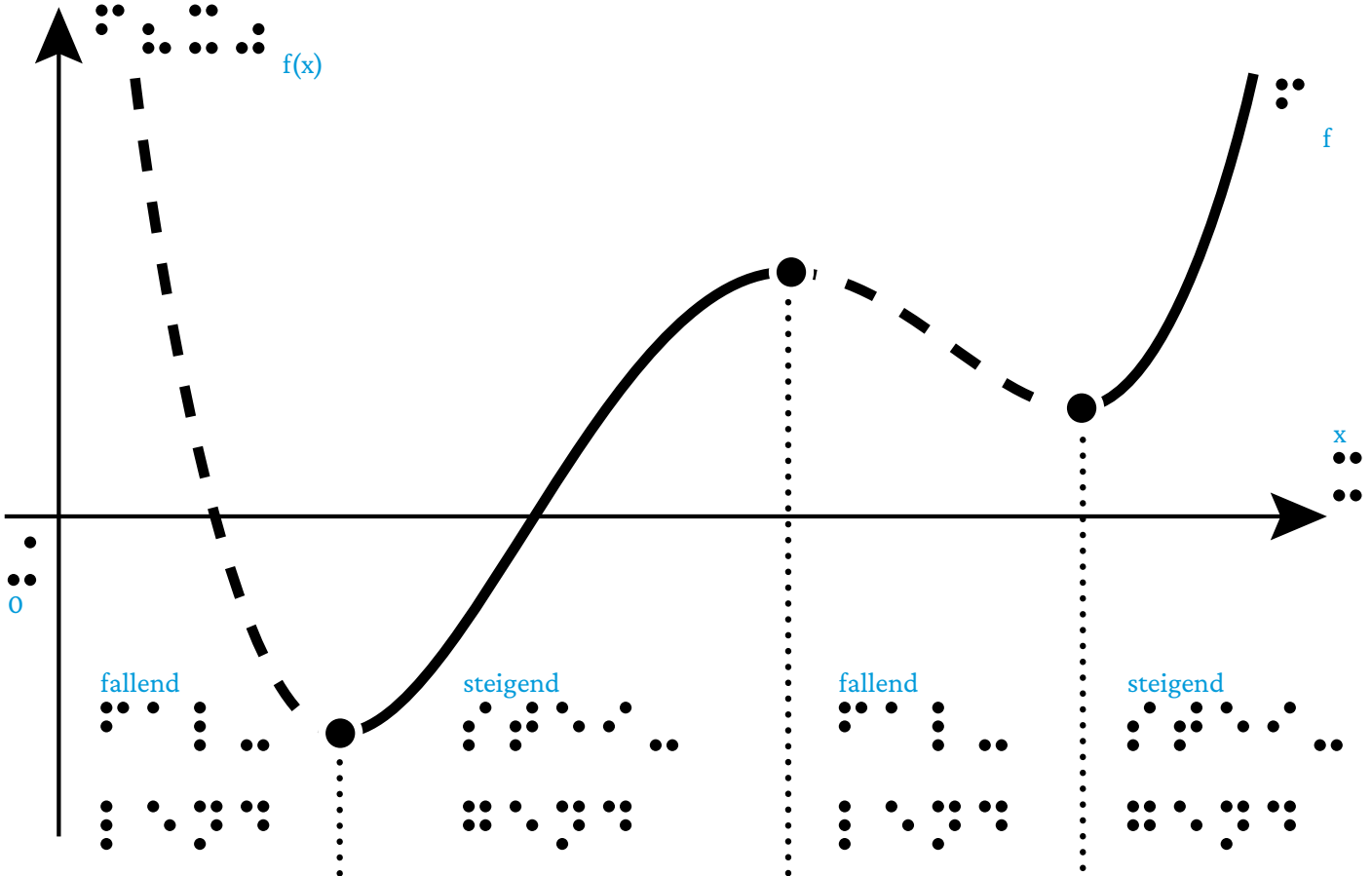


Nullstellen

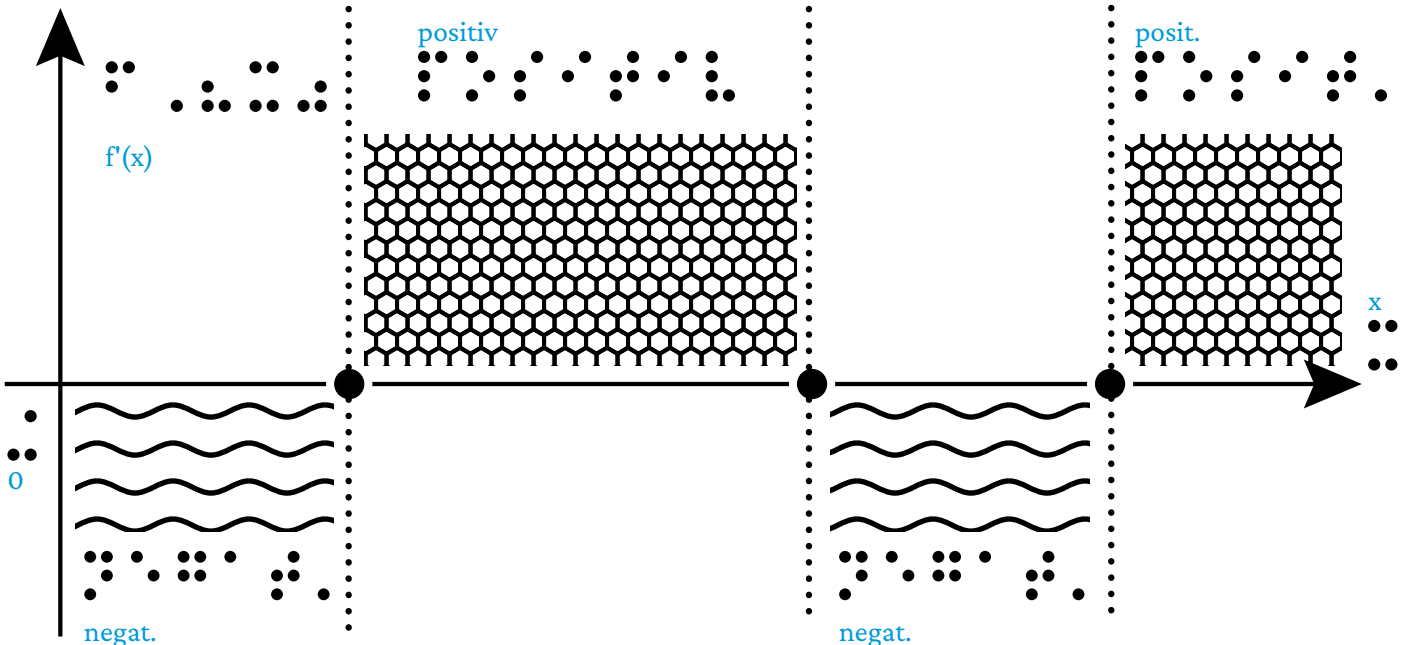


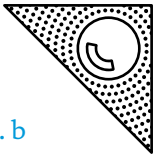
Grafisches Ableiten 1.

Funktion:



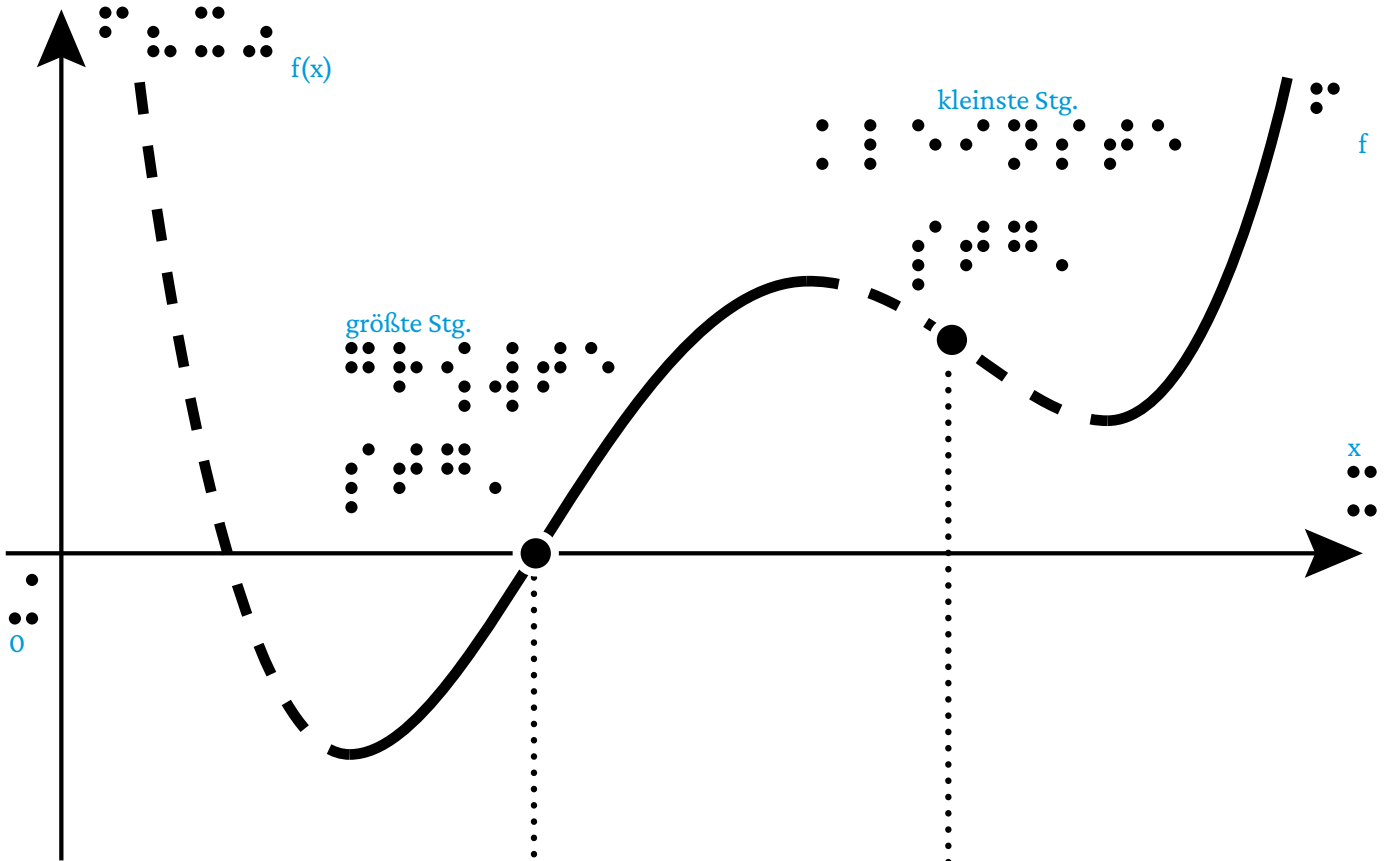
Ableitungsfunktion:



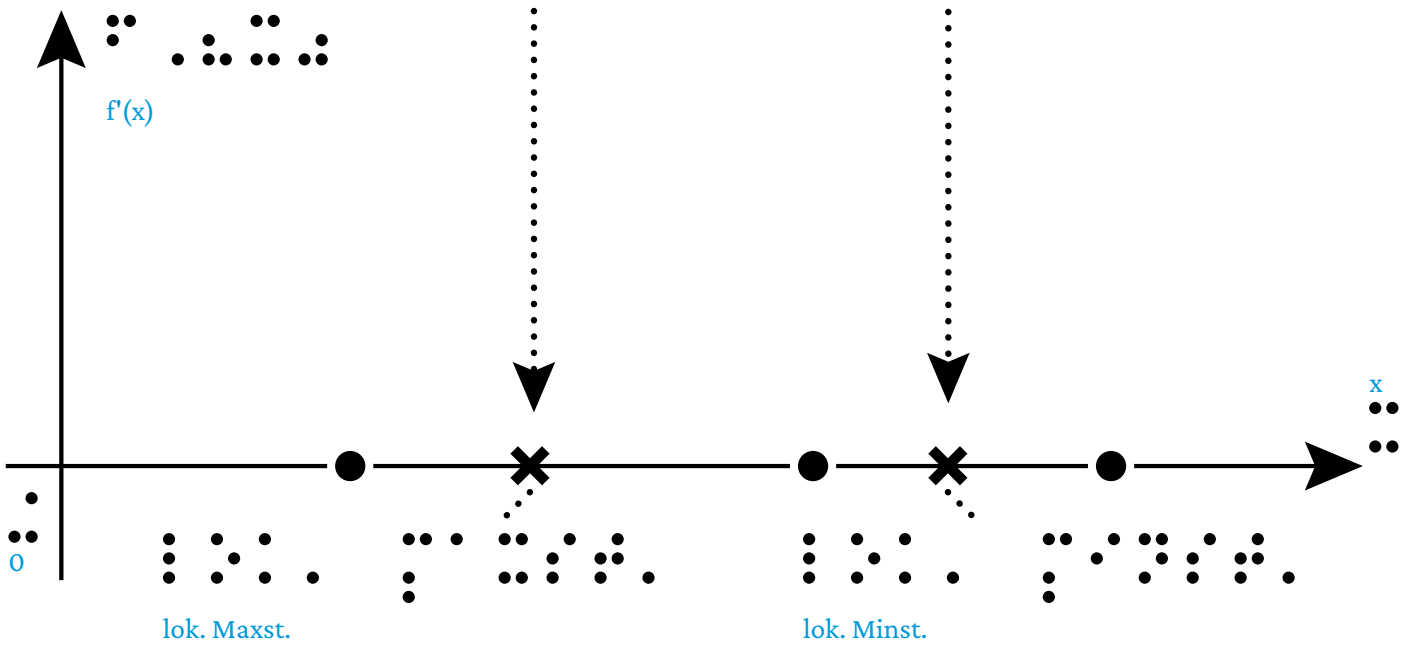


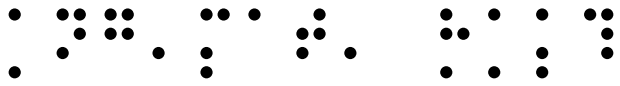
Grafisches Ableiten 1.

Funktion:



Ableitungsfunktion:

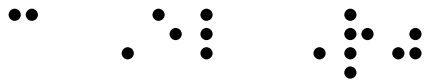




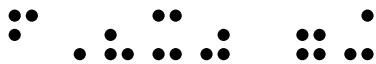
Ableitung von konstanten Funktionen



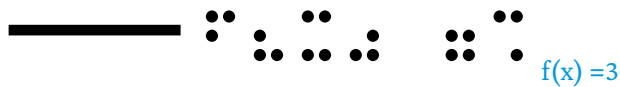
Regel:



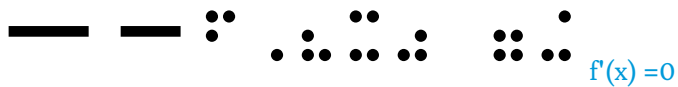
$f(x) = c$ (mit $c \in \mathbb{R}$)



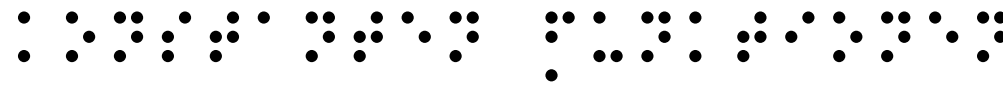
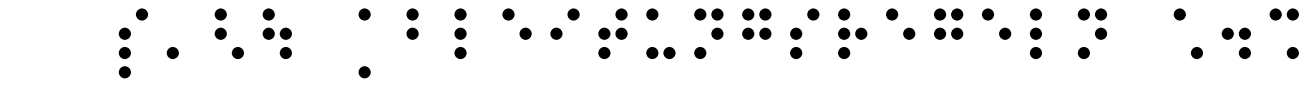
$f'(x) = 0$



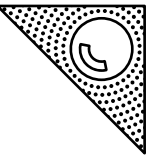
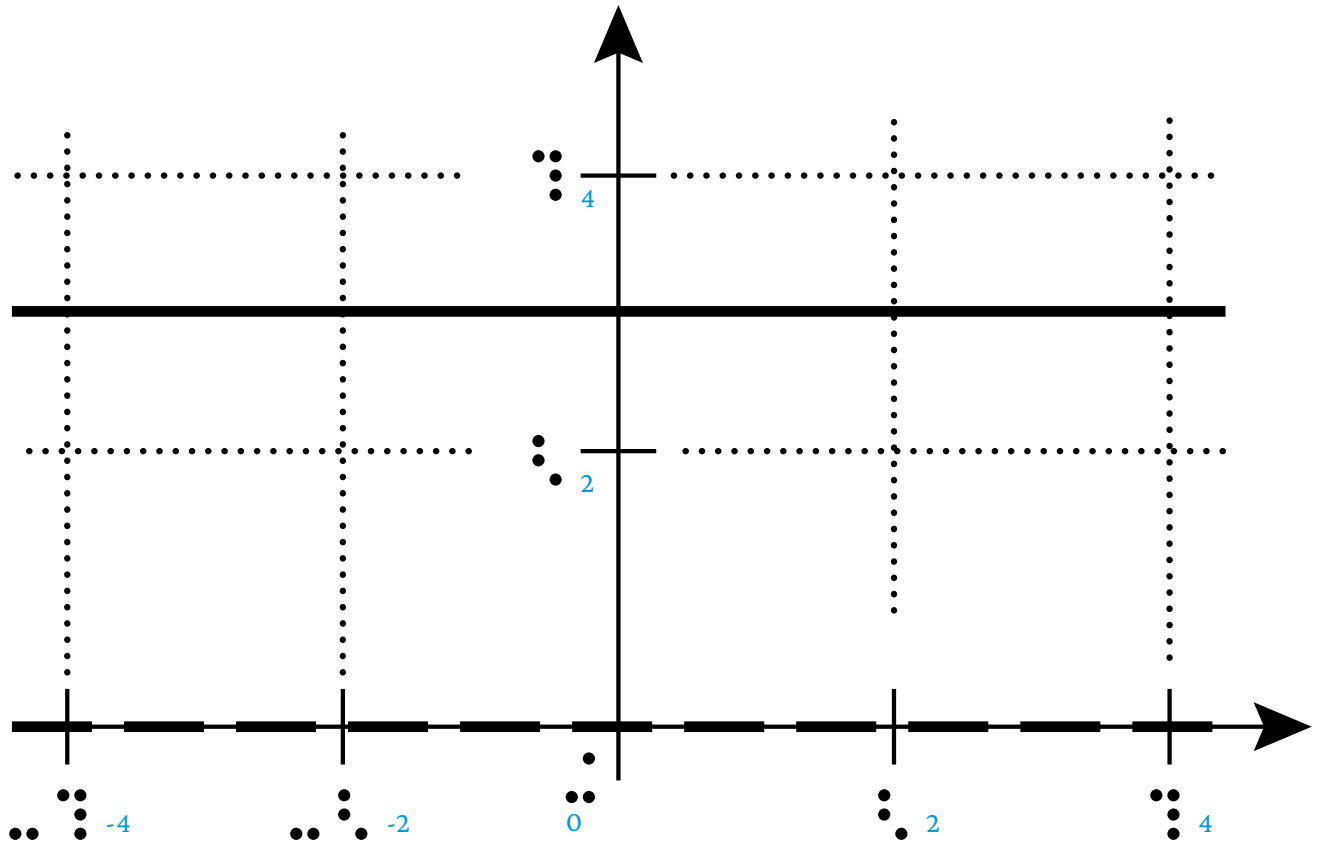
$f(x) = 3$



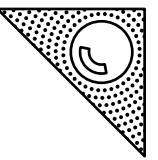
$f'(x) = 0$



Beispiel/Veranschaulichung



Angewandte Mathematik HAK4



Ableitung von Potenzfunktionen

Regel:

$$f(x) = x^n$$

$$f'(x) = n \cdot x^{n-1}$$

(mit $n \in \mathbb{R}$)

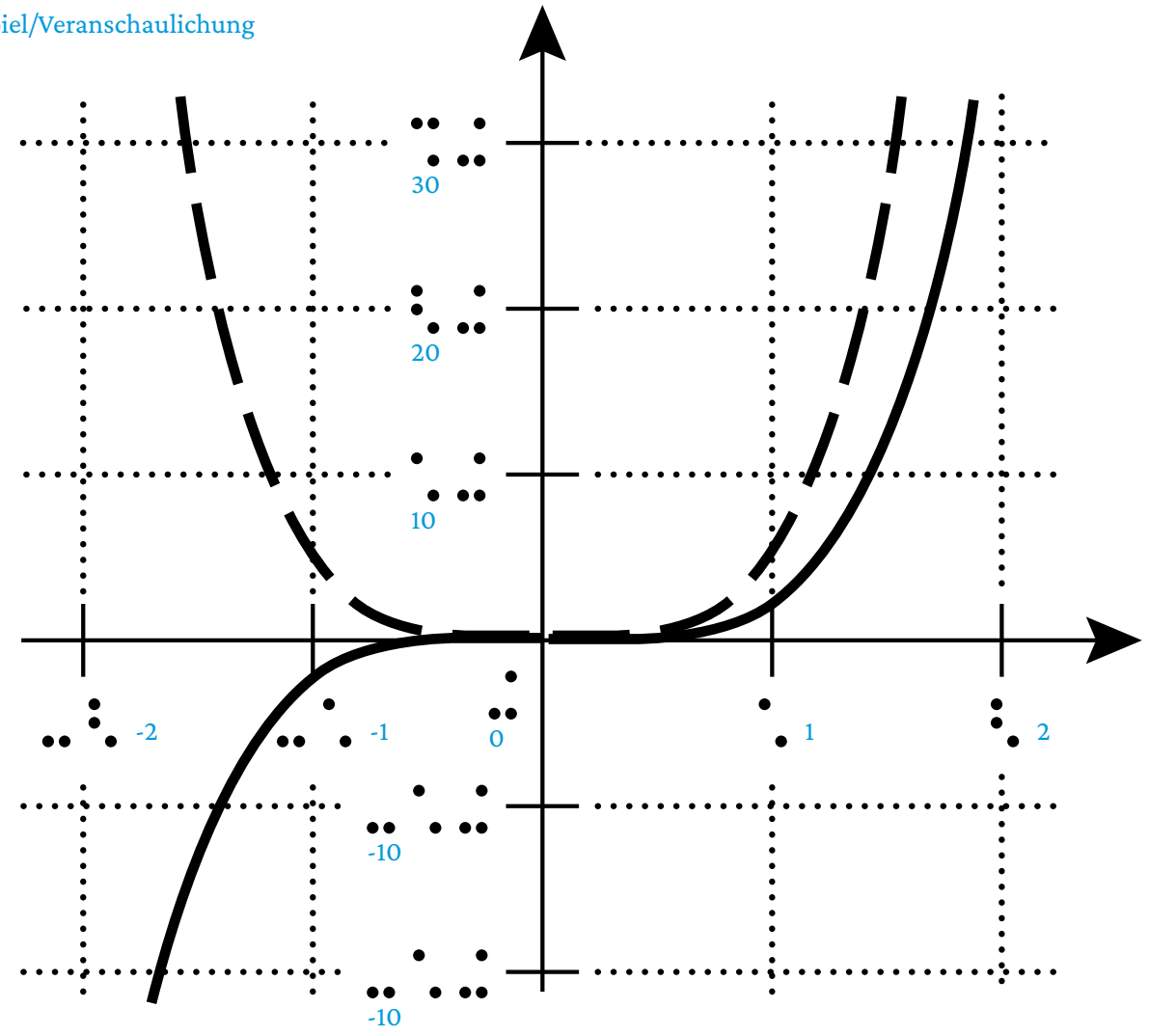
$$f(x) = x^n$$

$$f'(x) = n \cdot x^{n-1}$$

$$f(x) = x^5$$

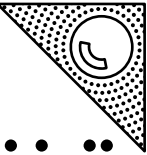
$$f'(x) = 5 \cdot x^4$$

Beispiel/Veranschaulichung



Ang.Mat. HAK4

S.28 Ableitungsregeln 3/3



Ang.Mat. HAK4

S.28 Ableitungsregeln 3/3

Ableitung der natürl. Exponentialfunktion

Regel:

Beispiel/Veranschaulichung

$f(x) = e^x$

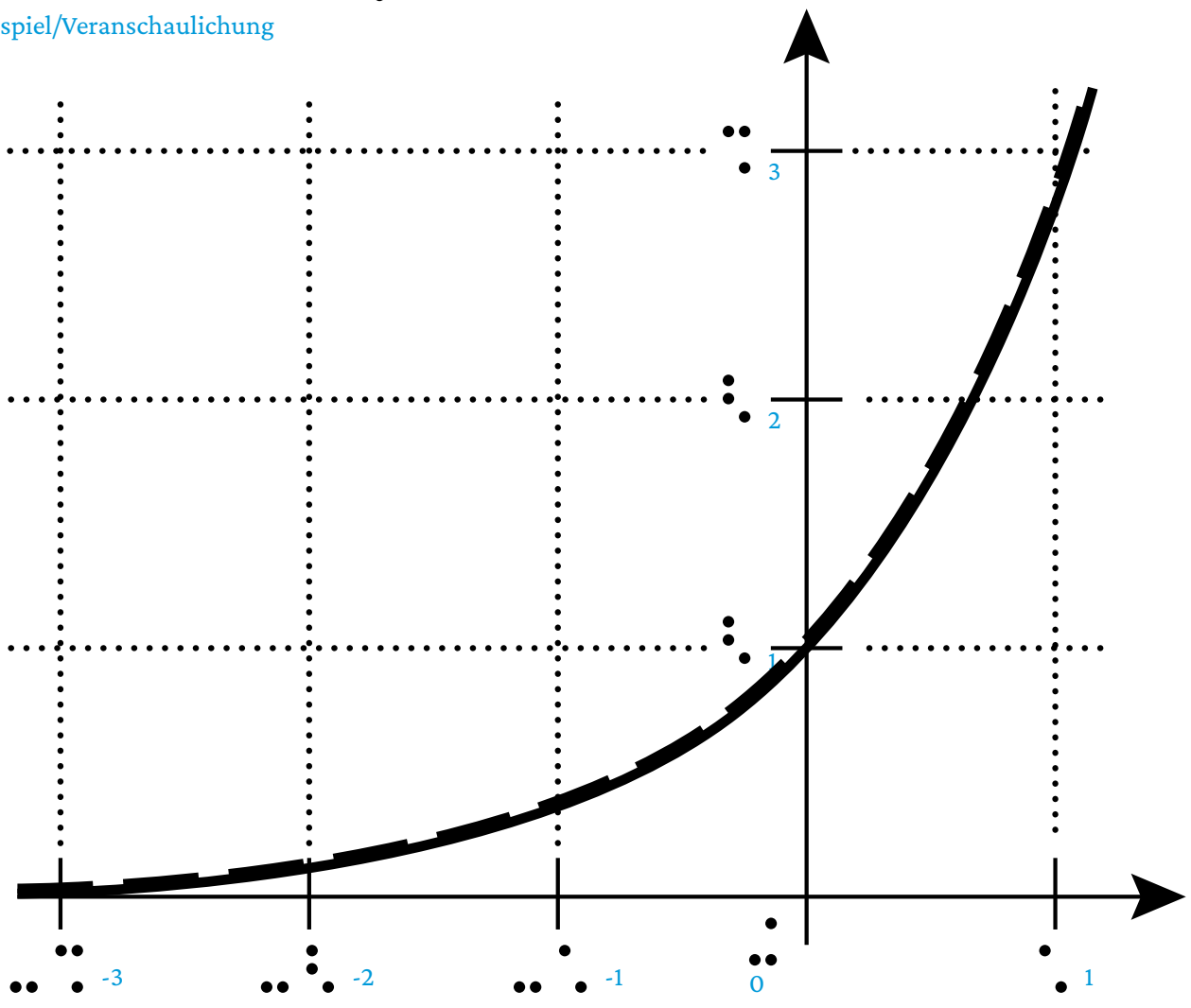
$f'(x) = e^x$

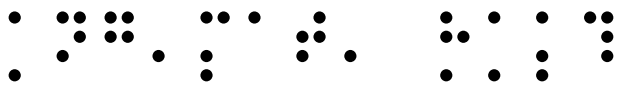
eulersche Zahl $e=2,71828...$

eulersche Zahl $e=2,71828...$

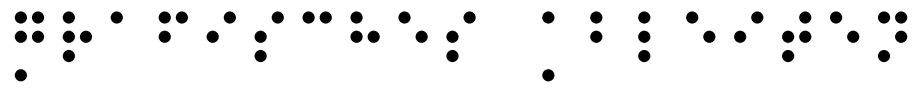
$f(x) = e^x$

$f'(x) = e^x$

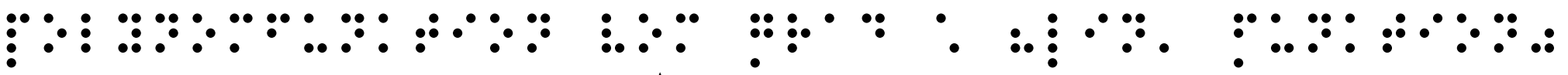
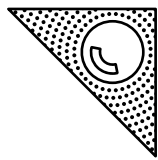




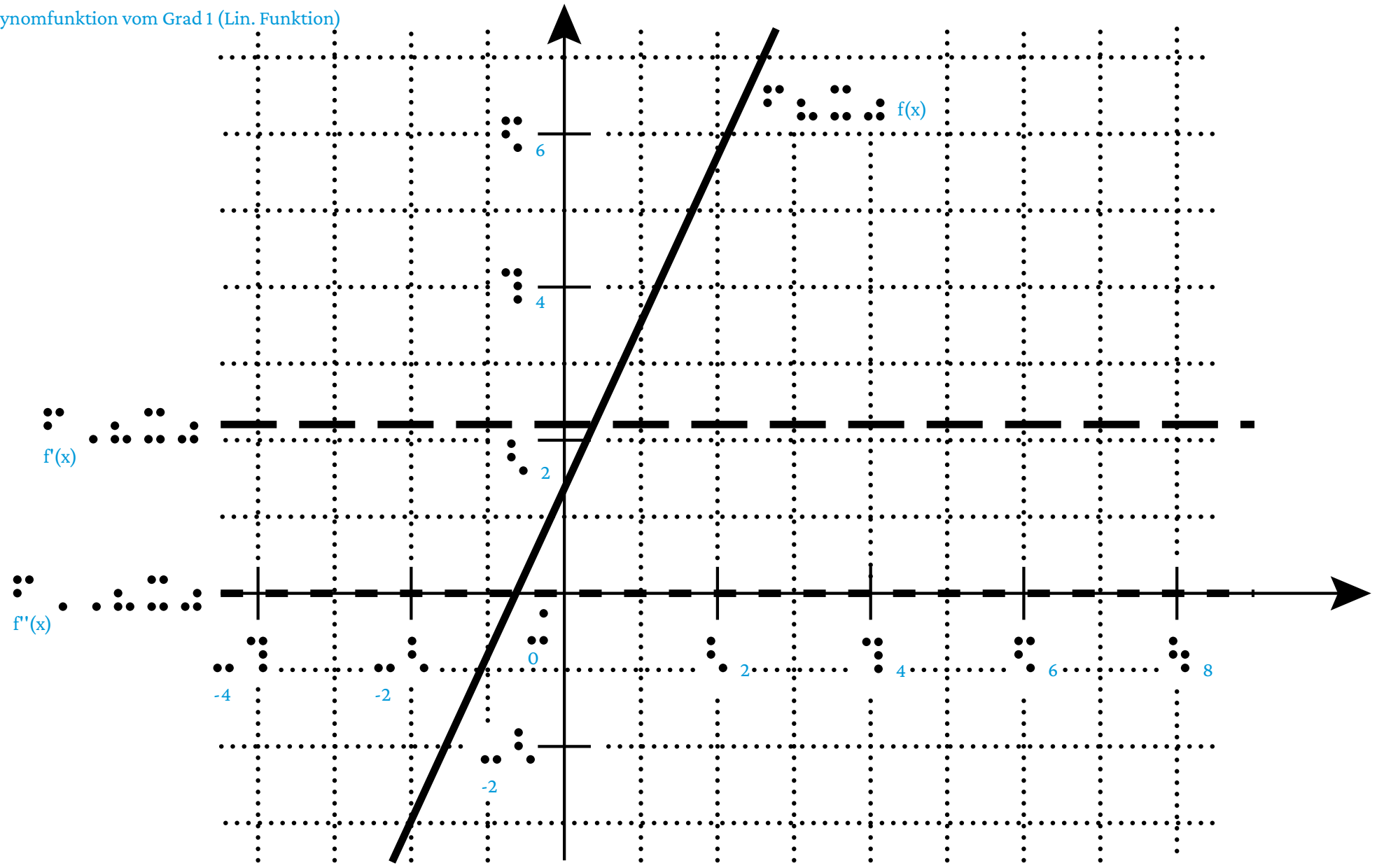
Ang. Mat. HAK4

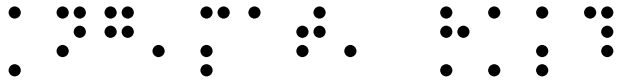


Grafisches Ableiten



Polynomfunktion vom Grad 1 (Lin. Funktion)

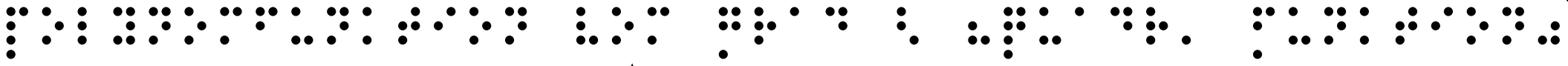
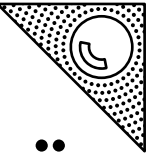




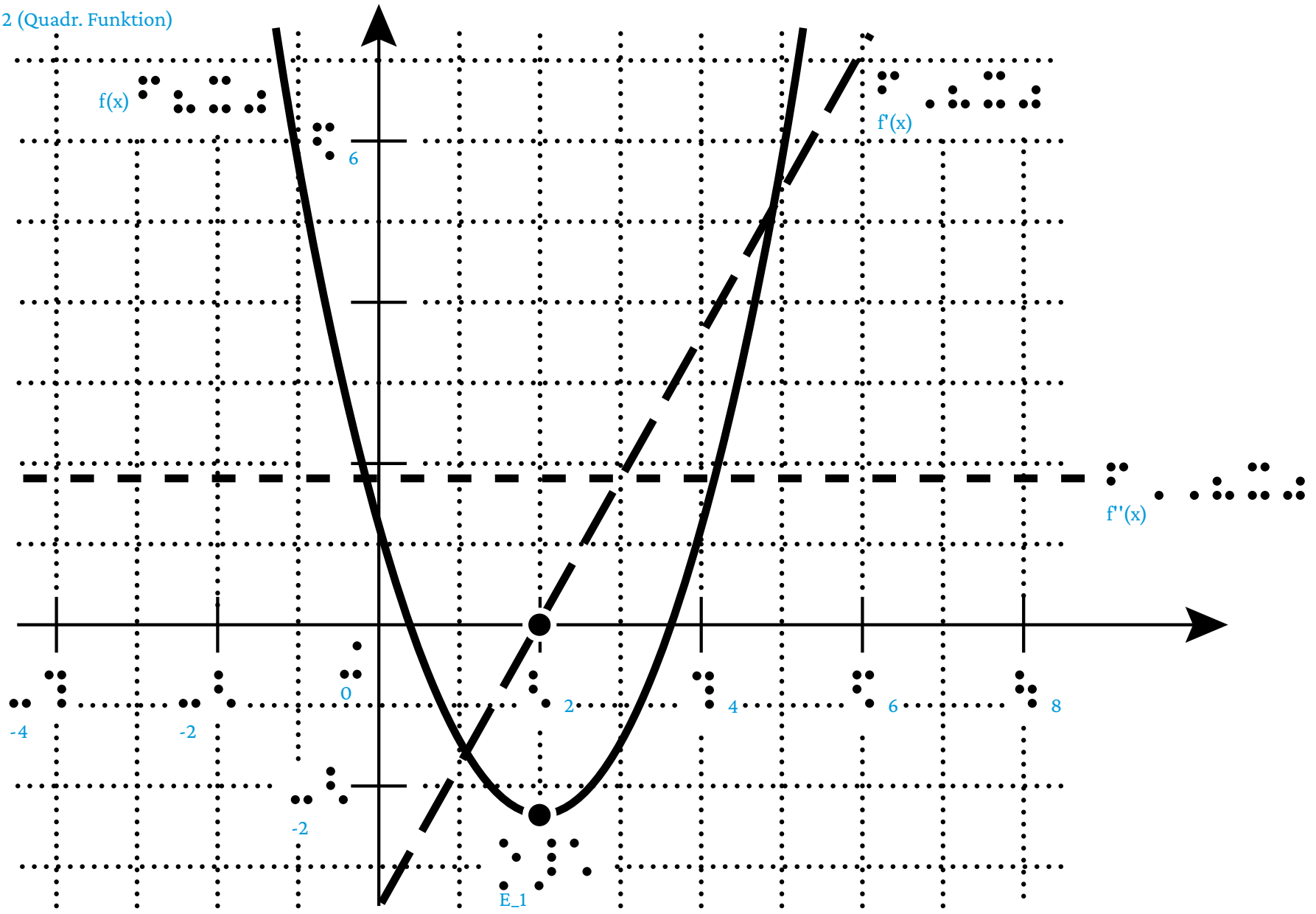
Ang. Mat. HAK4

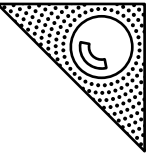


Grafisches Ableiten

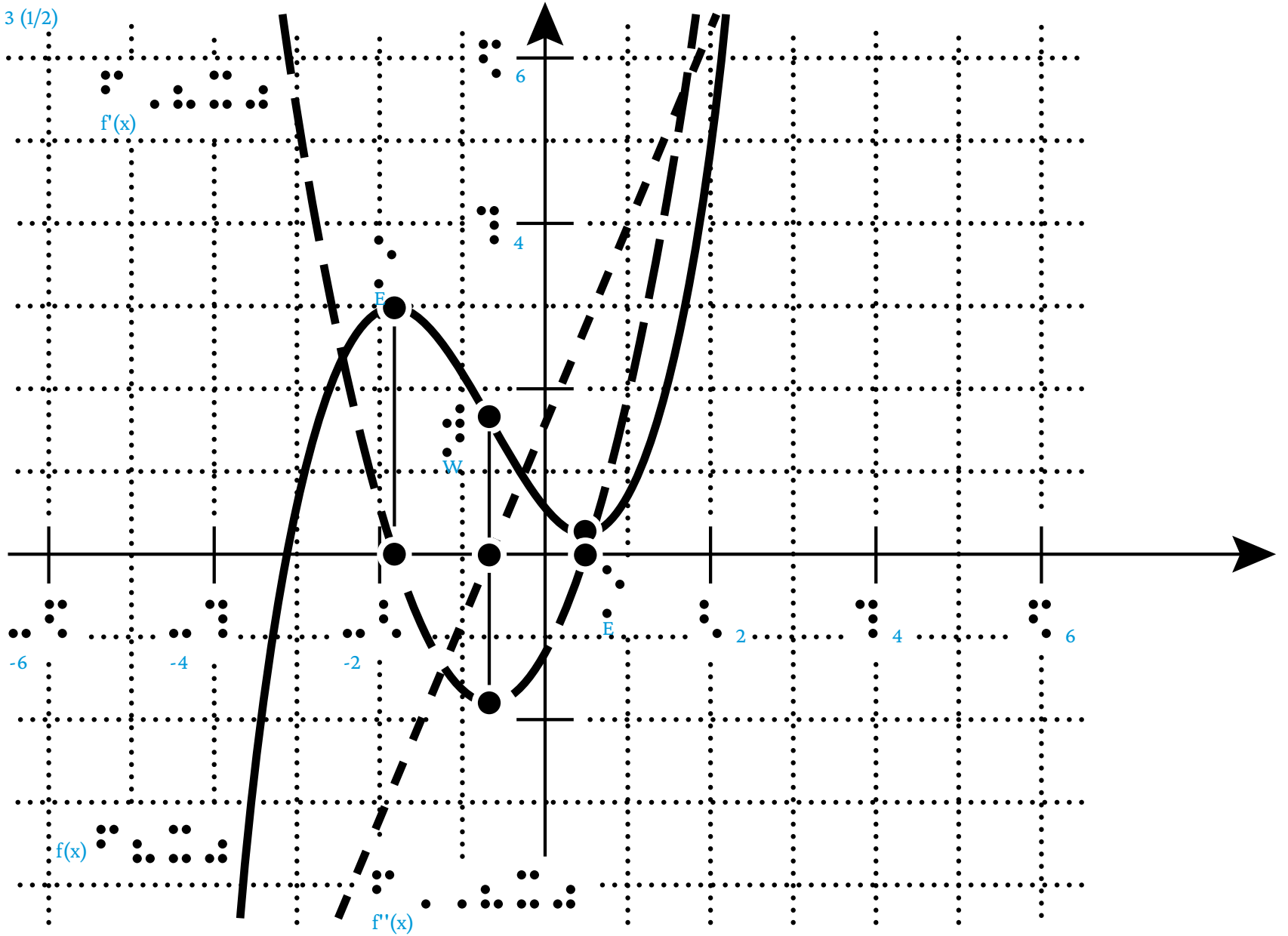


Polynomfunktion vom Grad 2 (Quadr. Funktion)



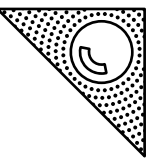


Polynomfunktion vom Grad 3 (1/2)



Ang.Mat. HAK4

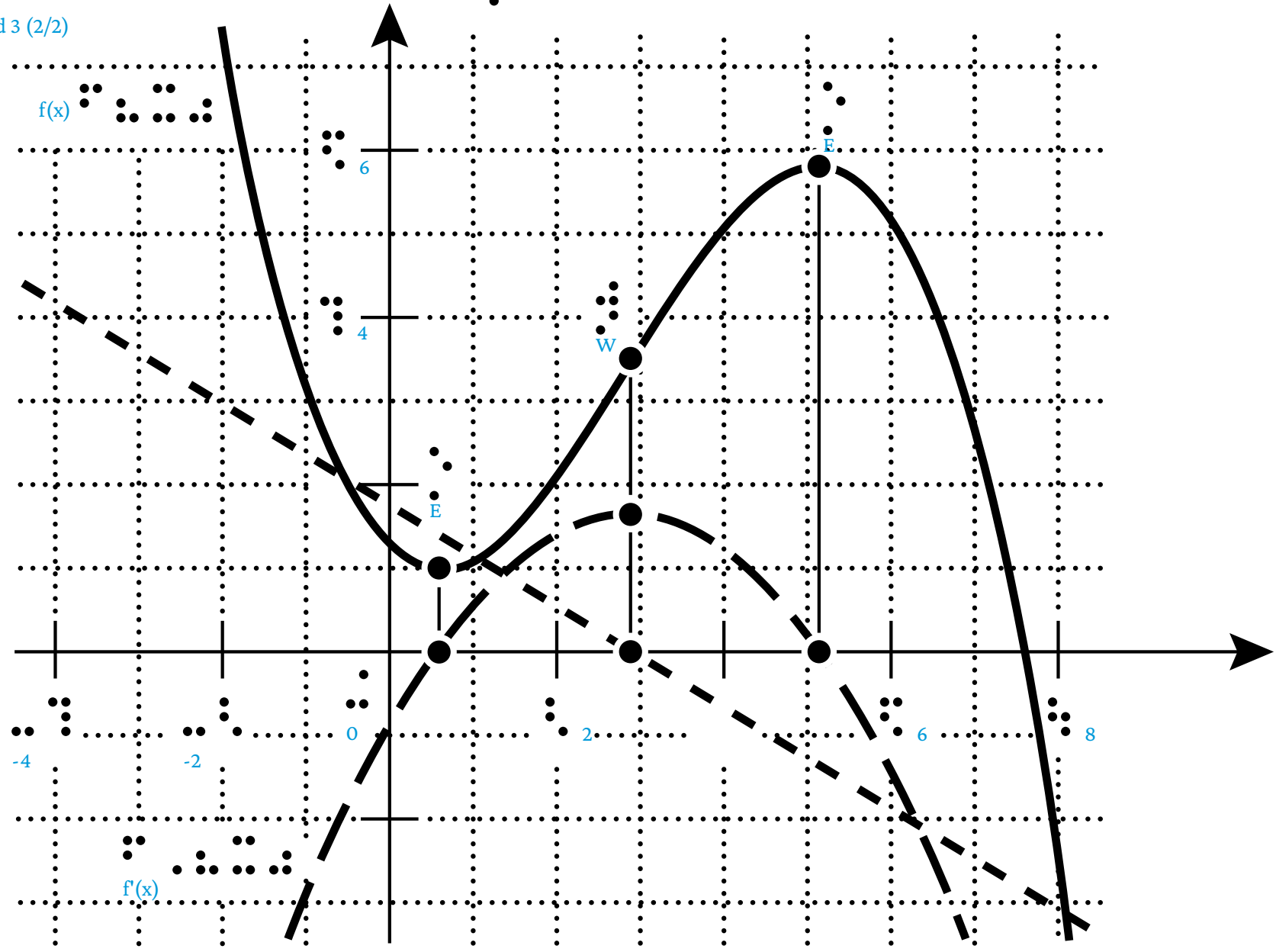
Grafisches Ableiten

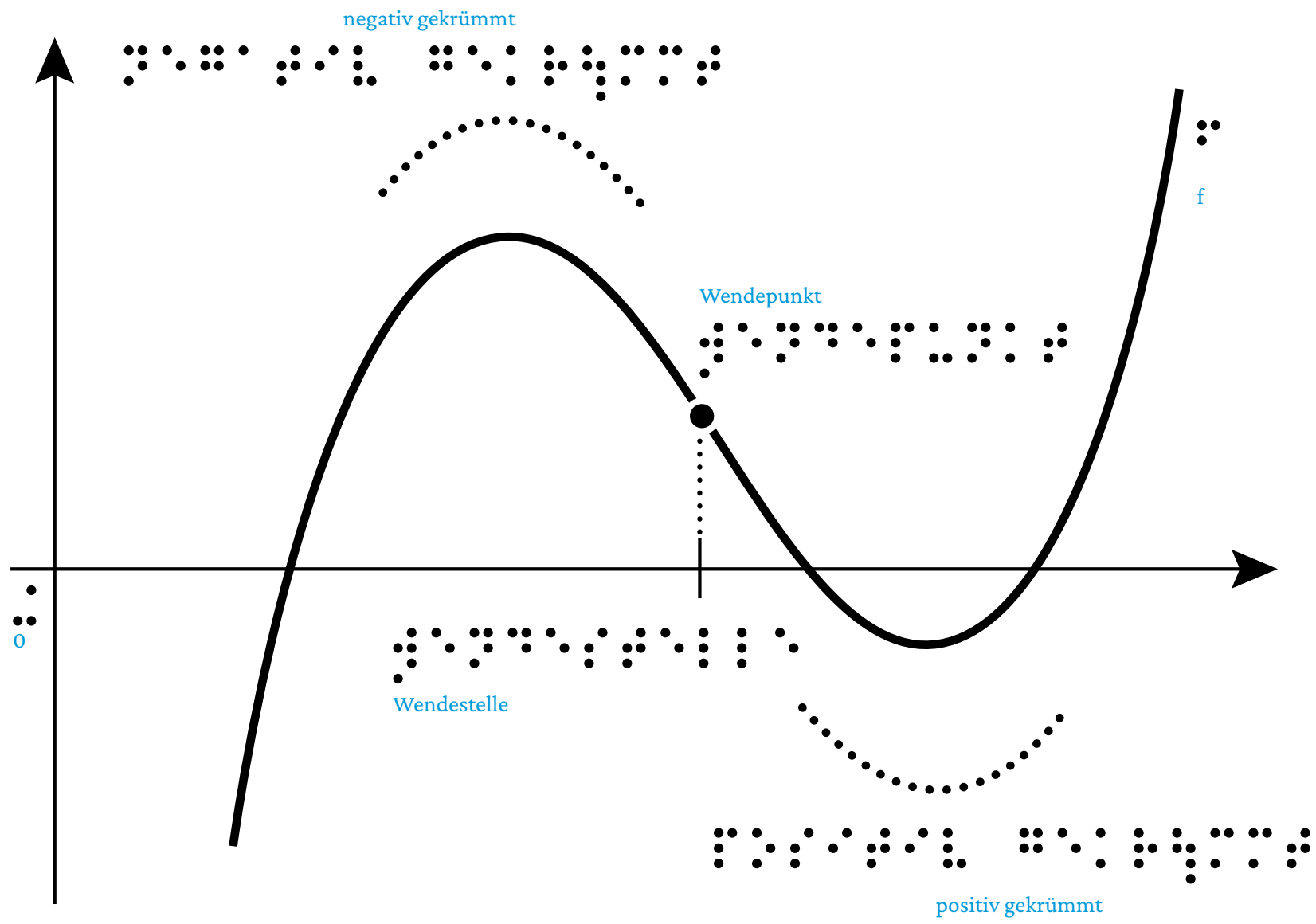


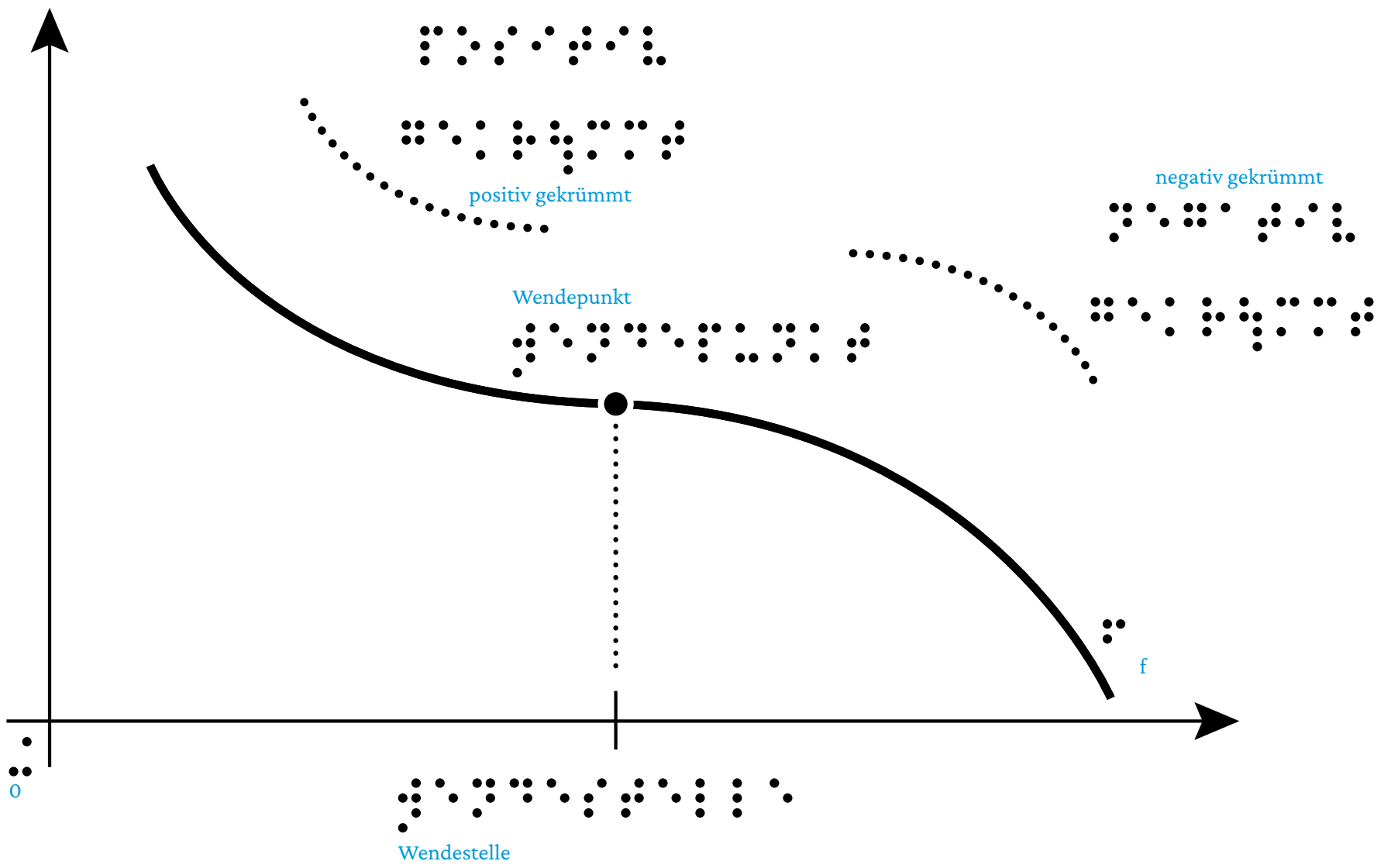
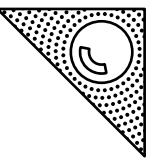
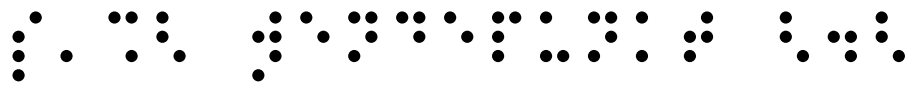
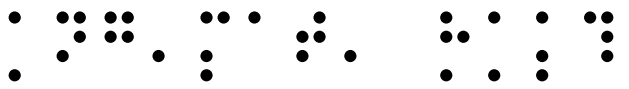
Polynomfunktion vom Grad 3 (2/2)

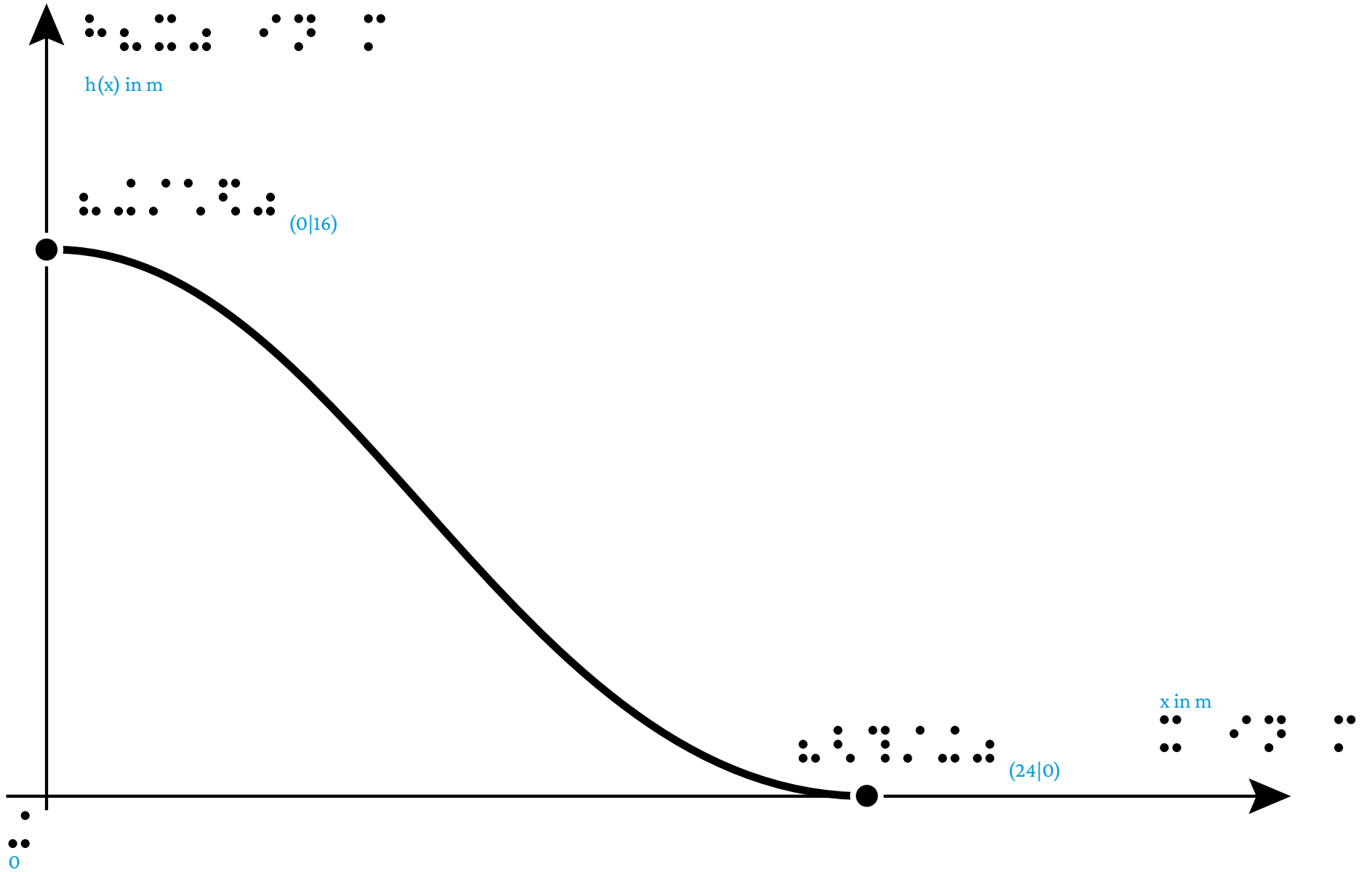
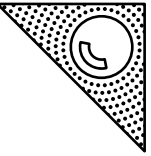
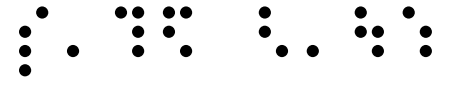
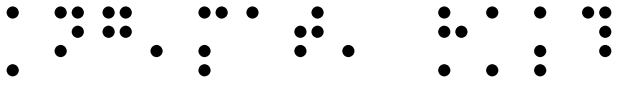
$f(x)$

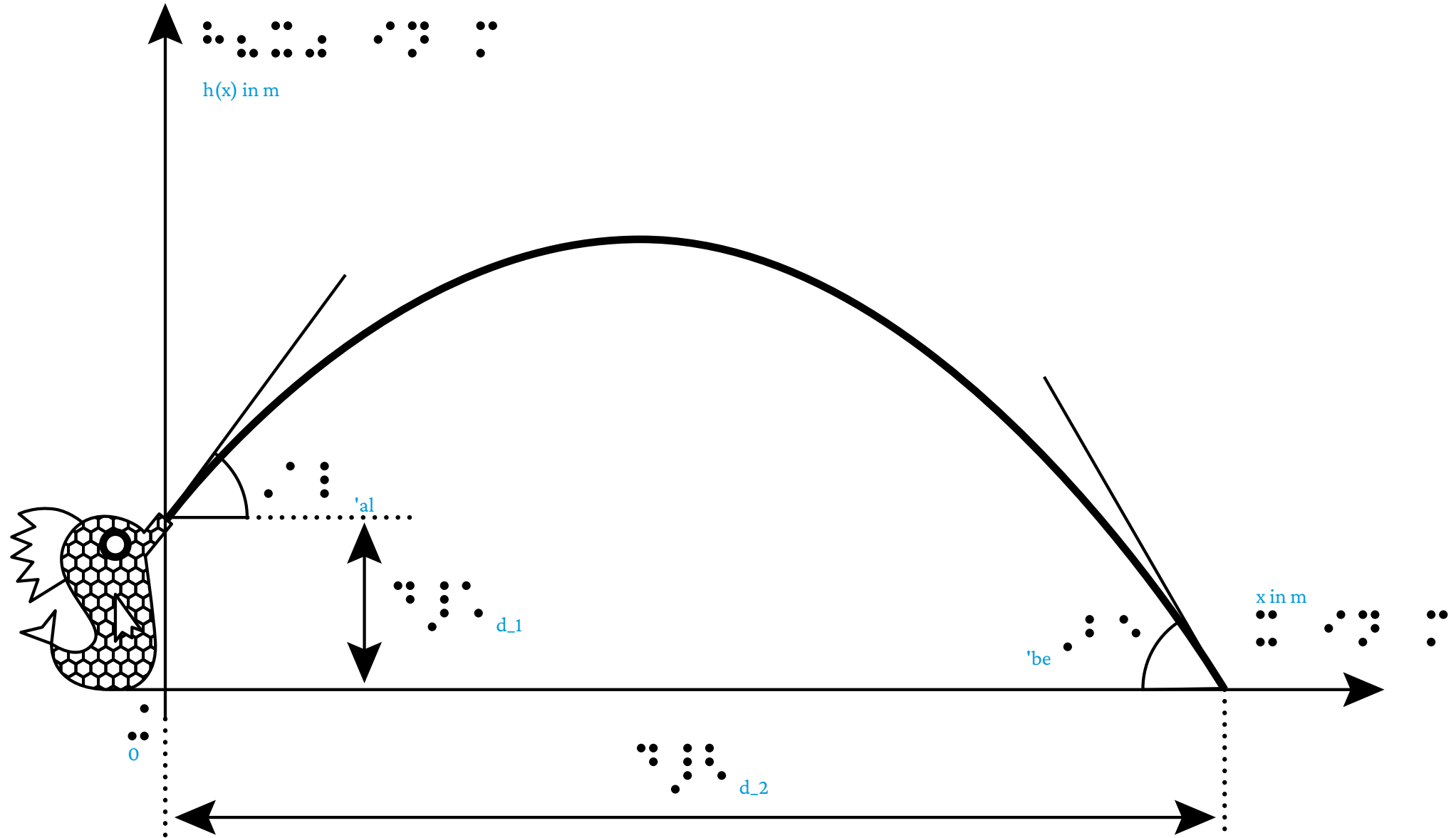
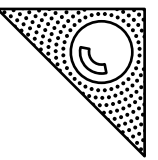
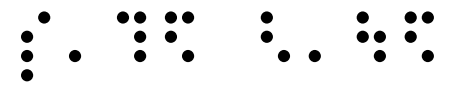
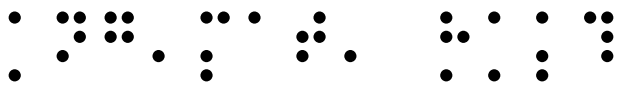
$f'(x)$

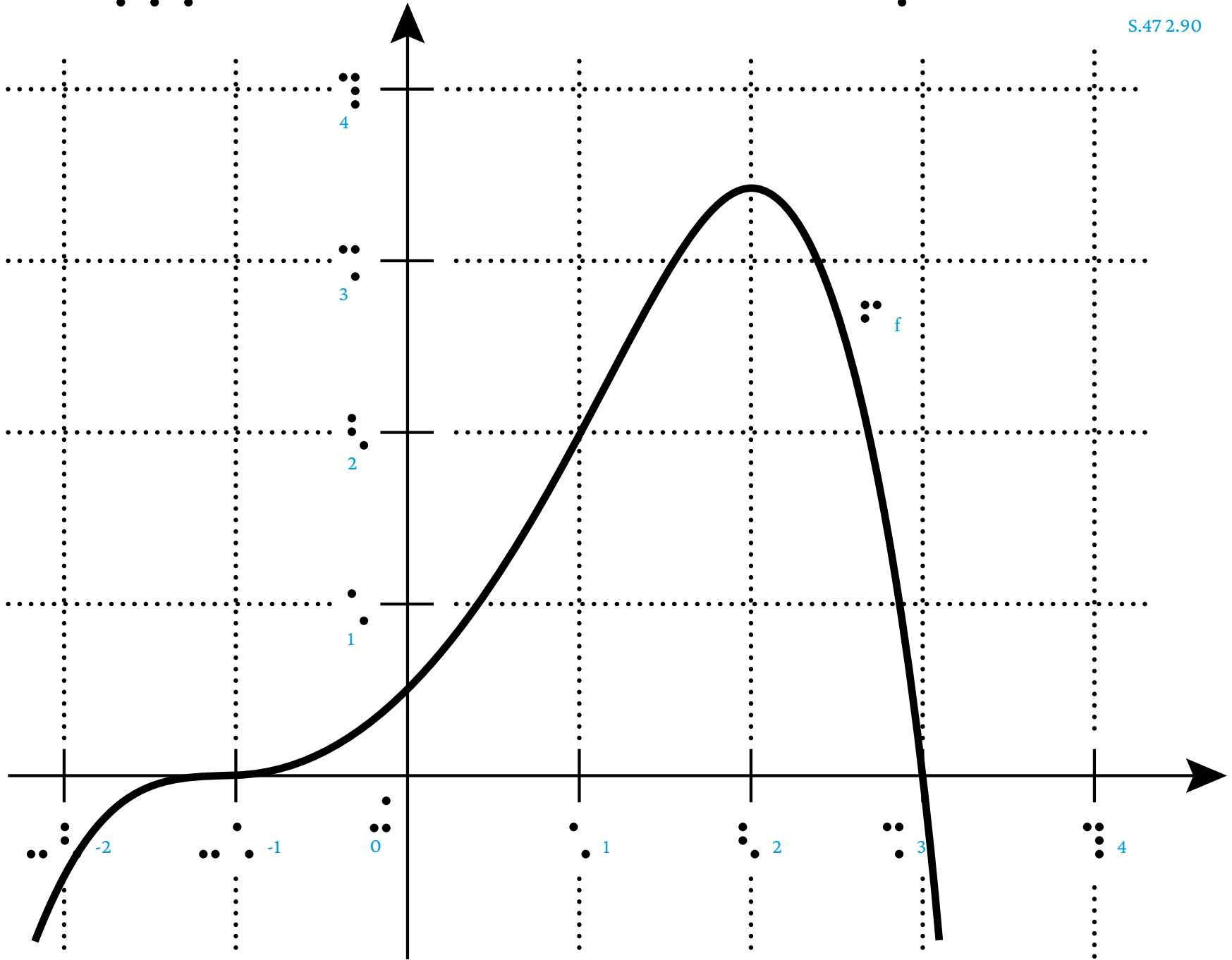
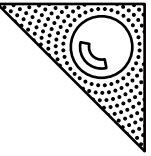


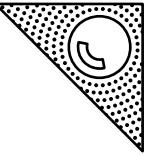
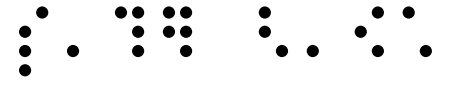
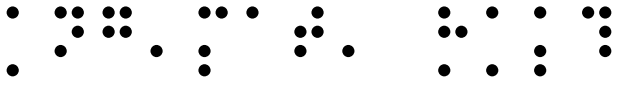






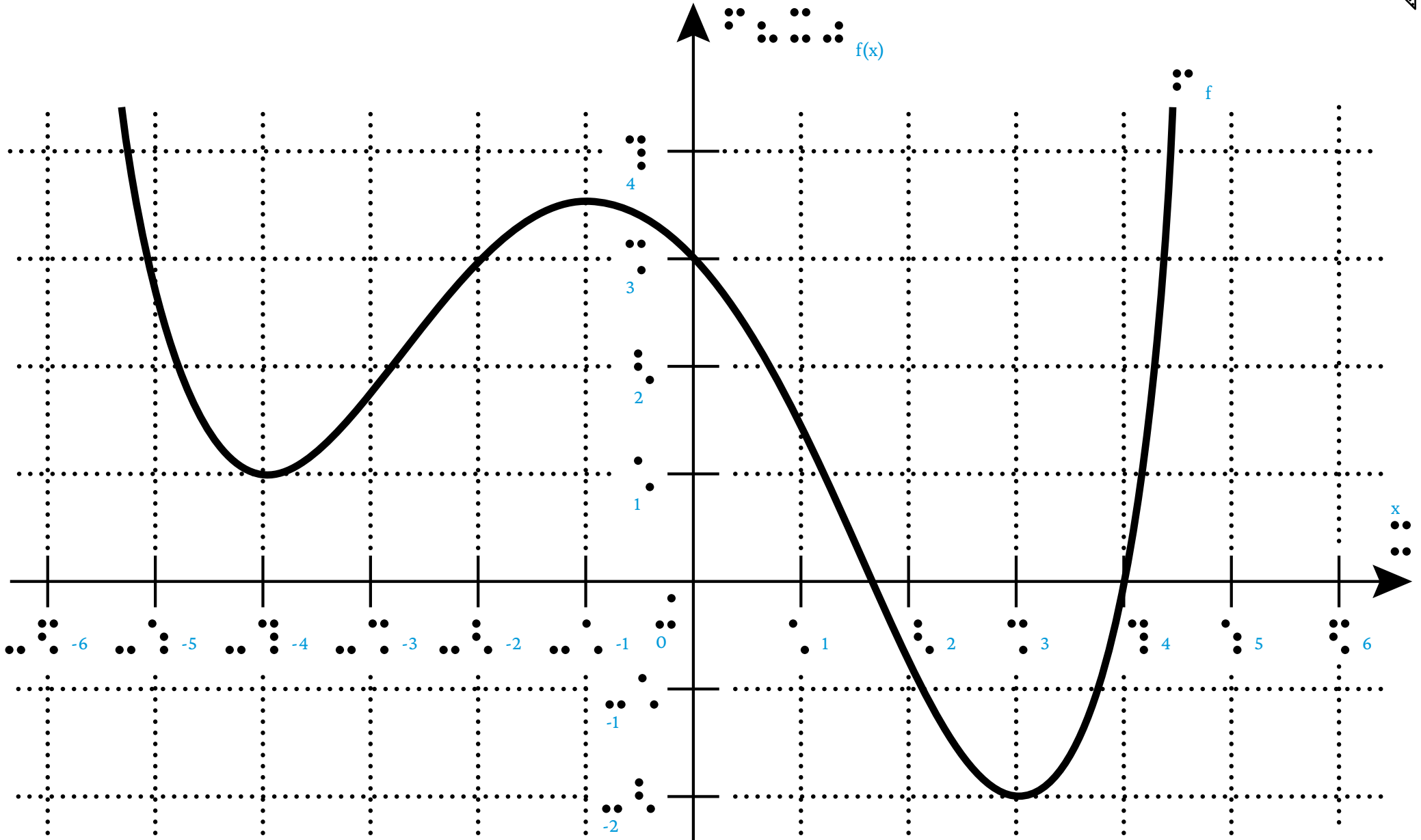


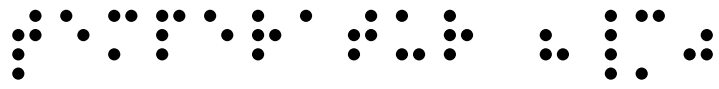
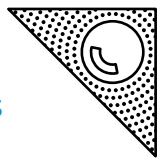
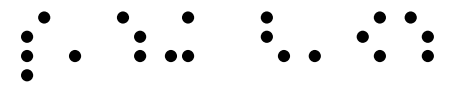
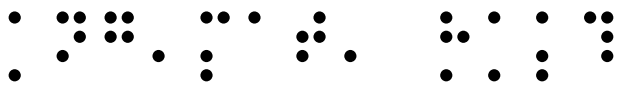




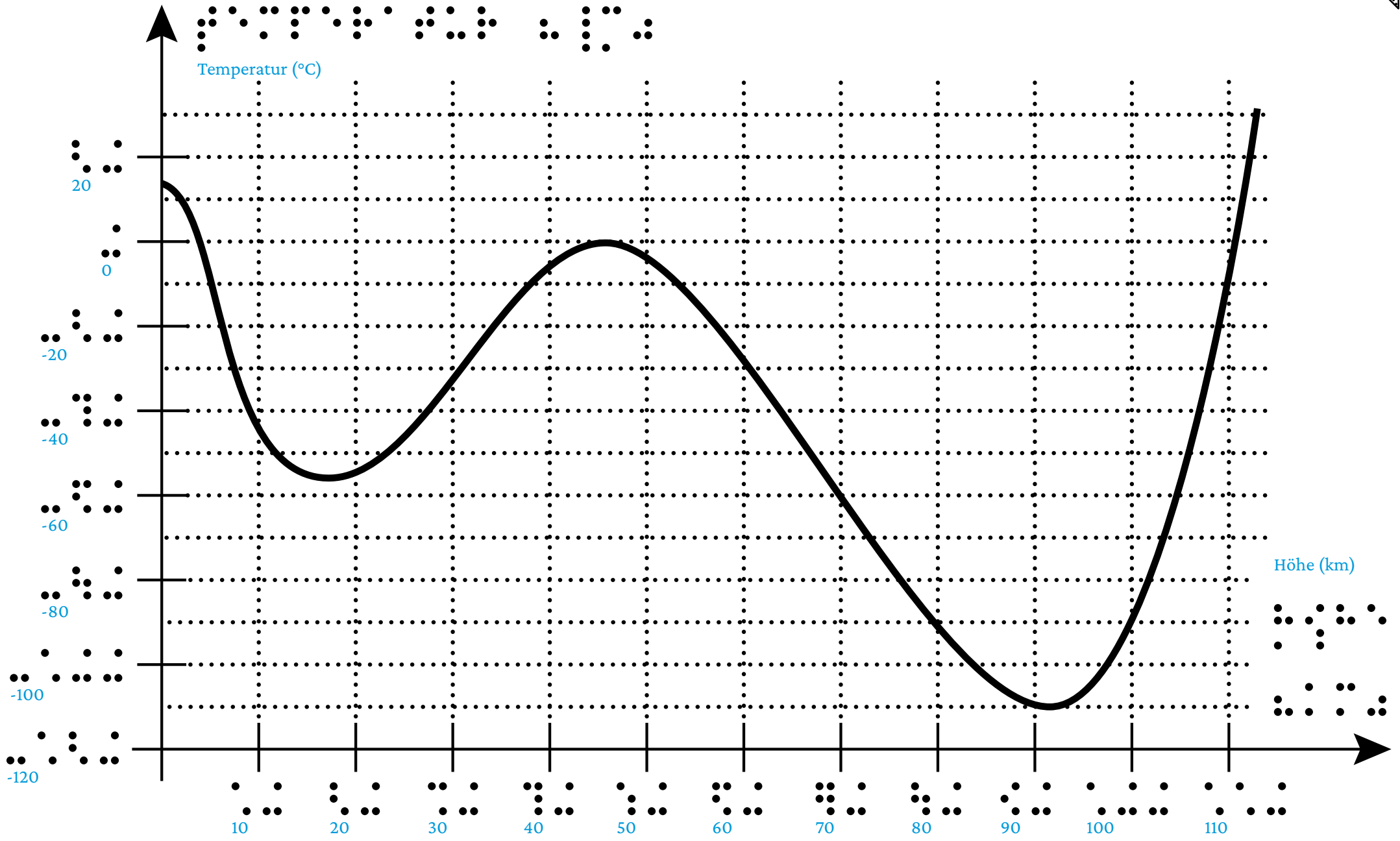
$f(x)$

f



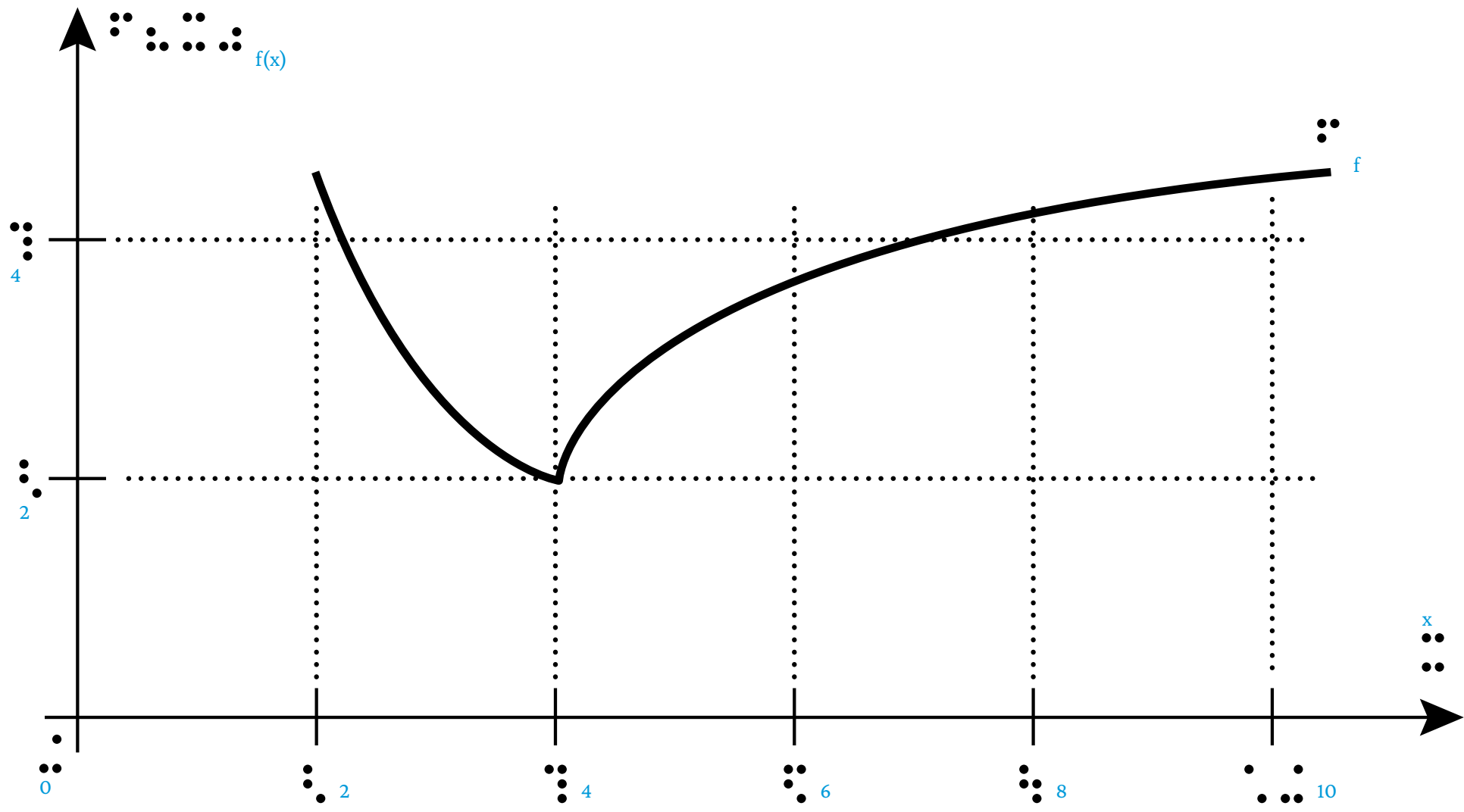
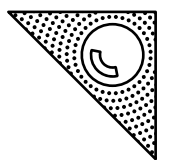
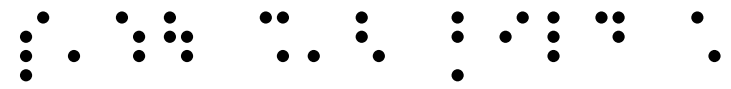
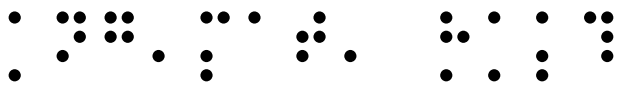


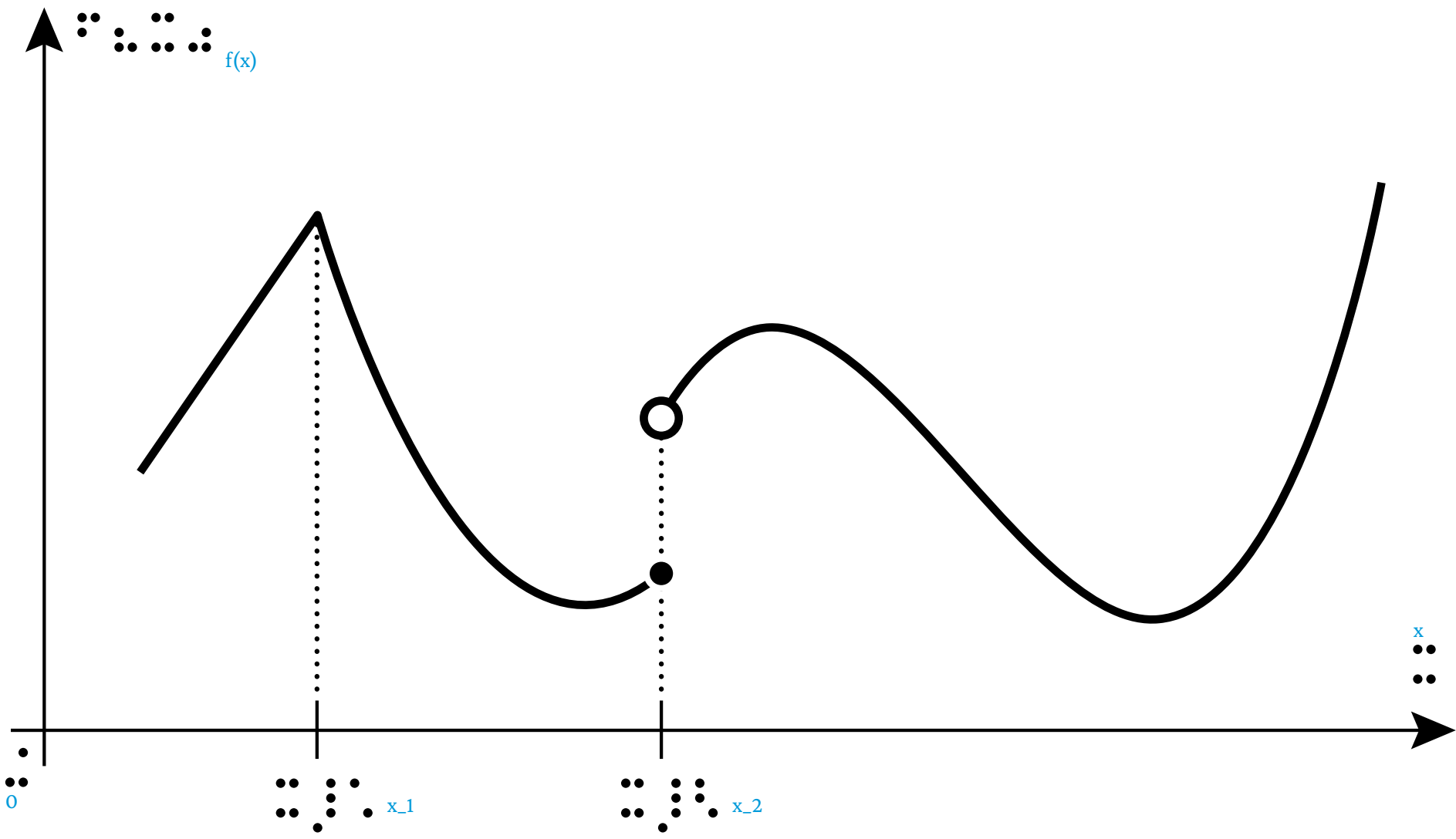
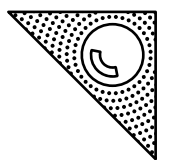
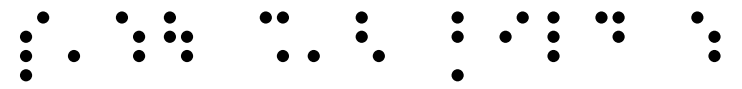
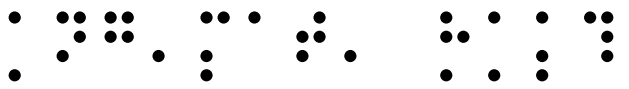
Temperatur (°C)

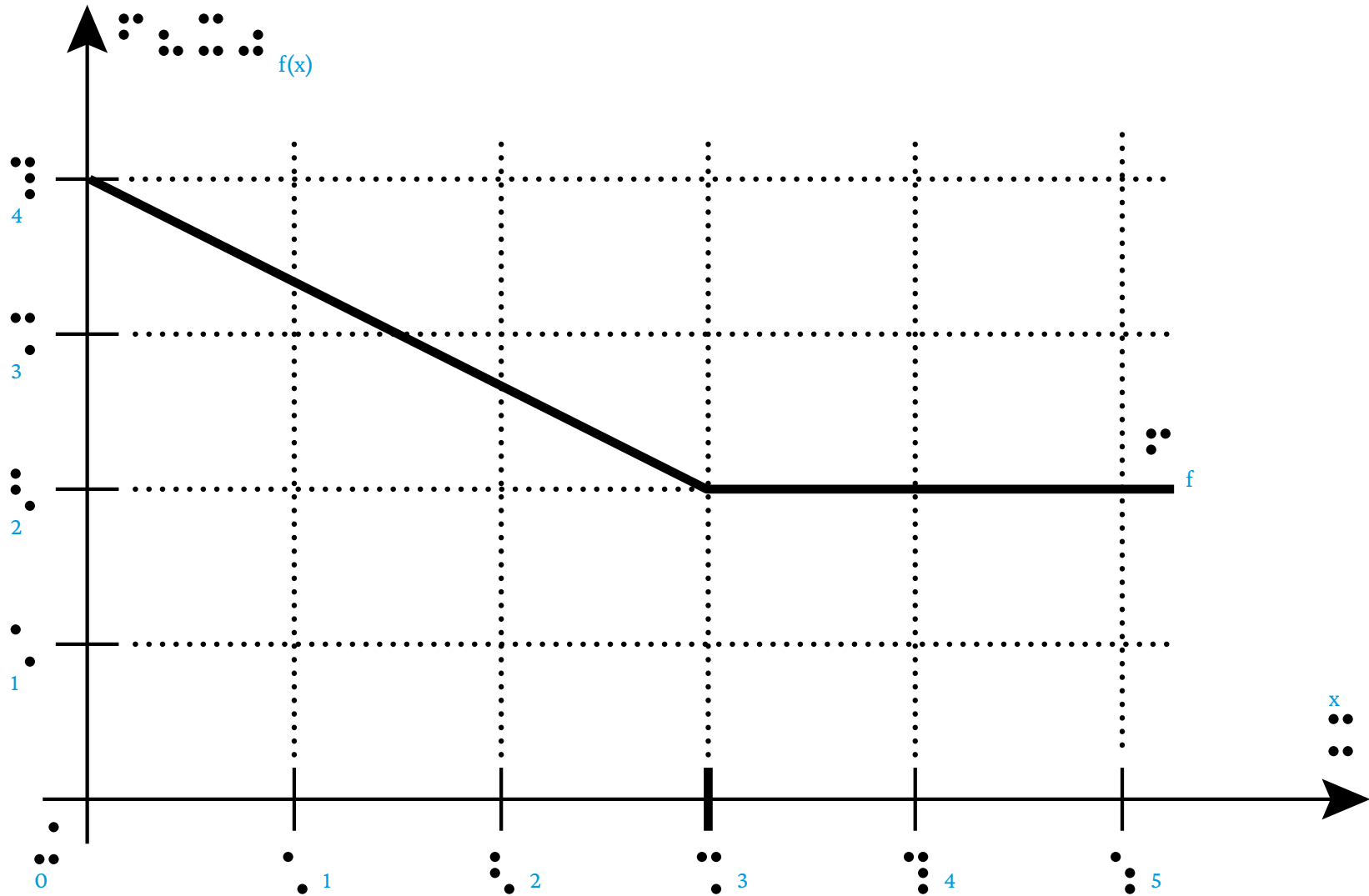
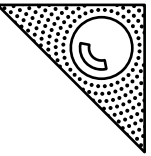
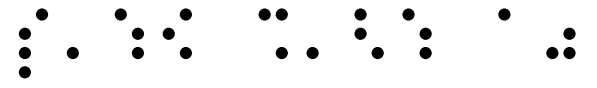
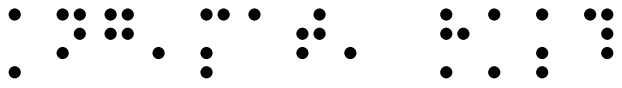


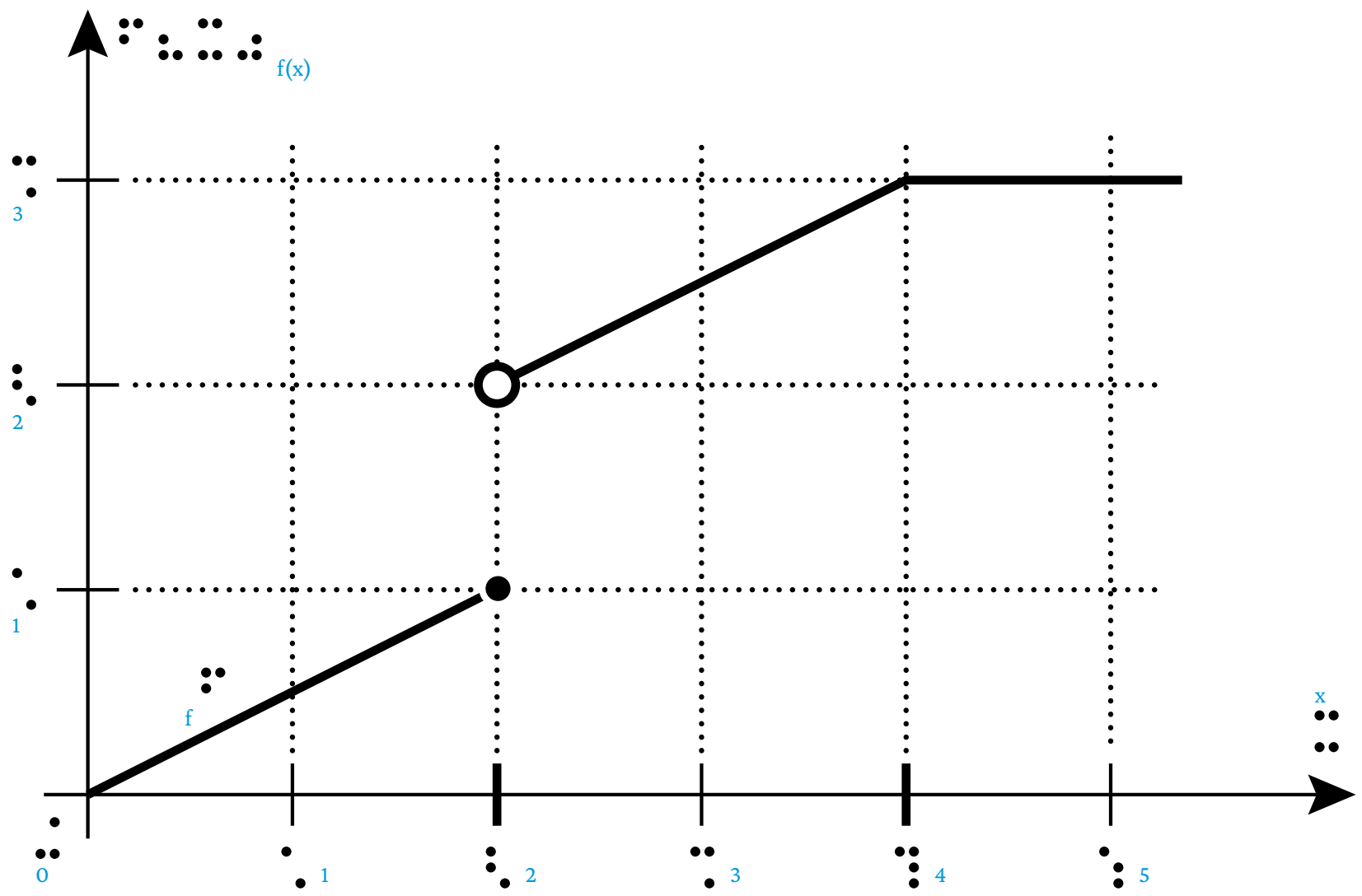
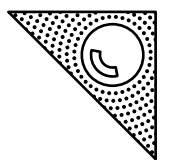
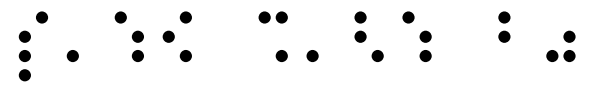
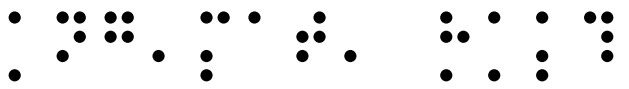
Höhe (km)

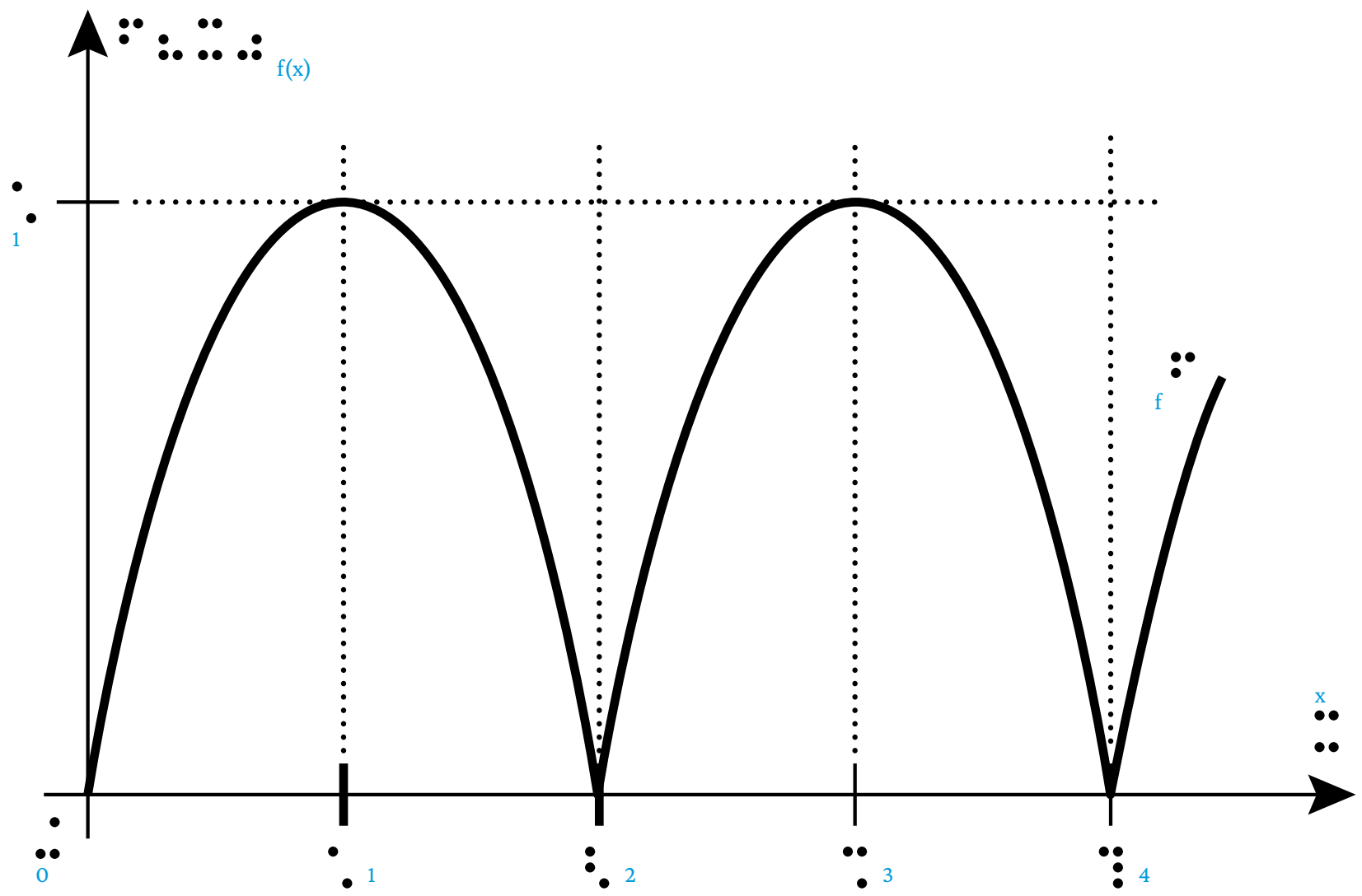
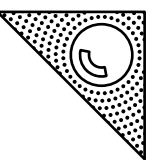
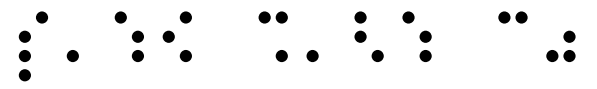
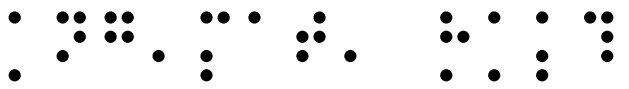
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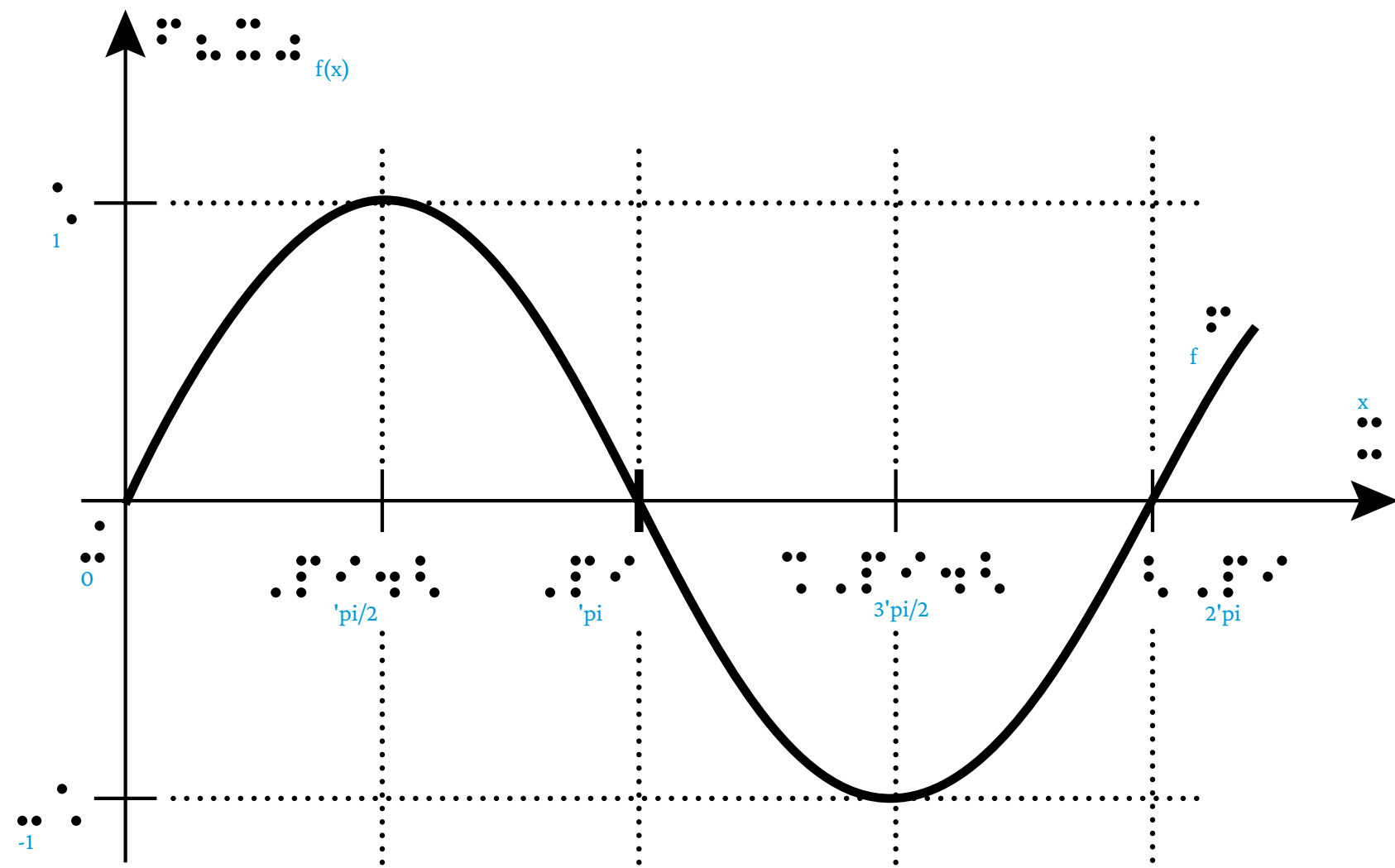
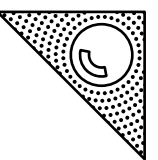
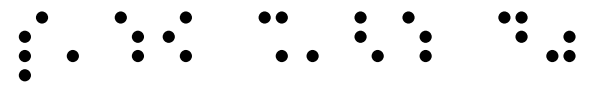
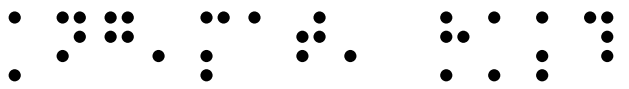


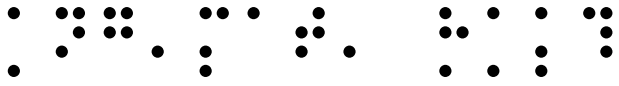
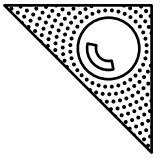












Ang.Mat. HAK4

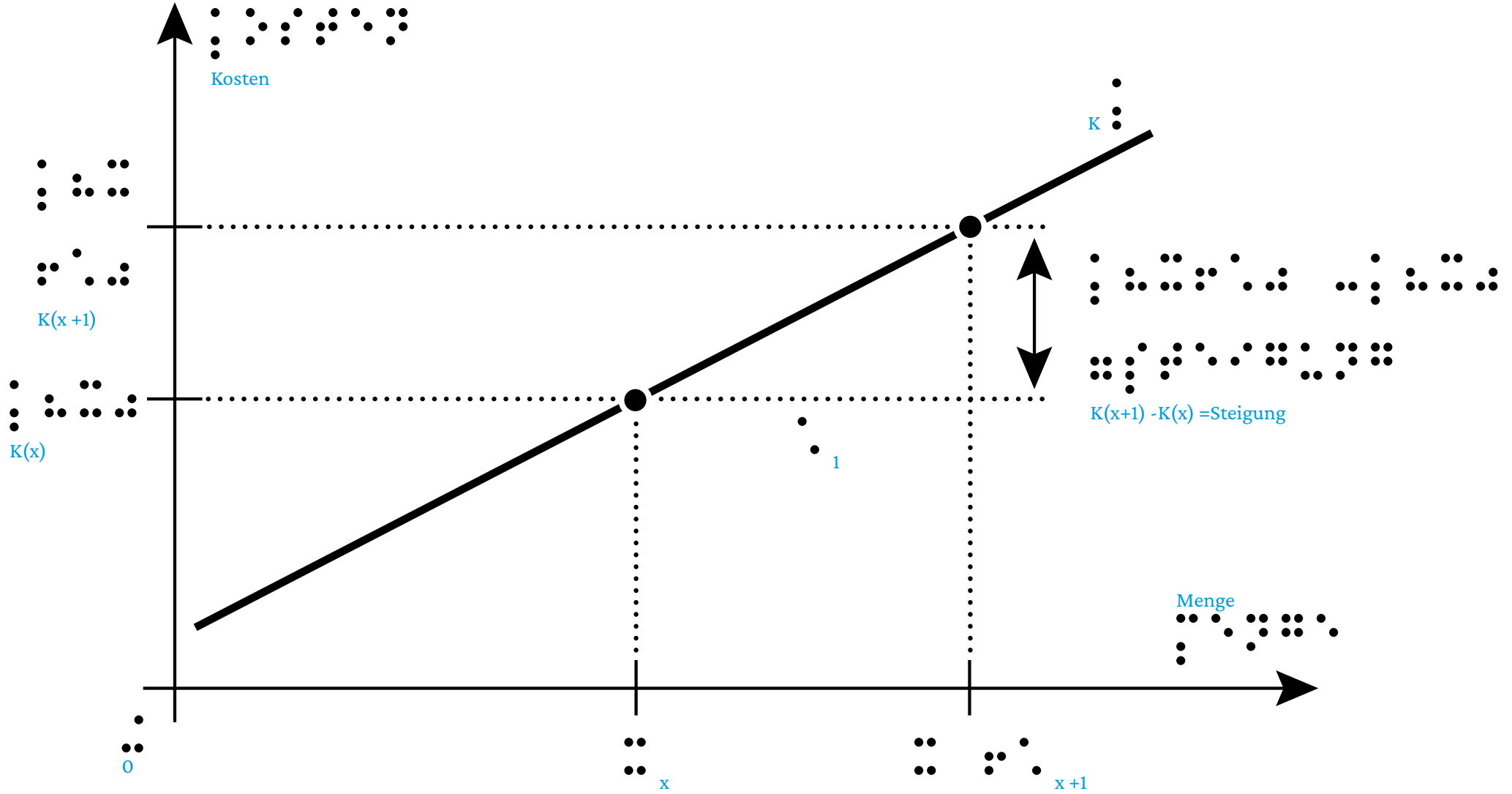
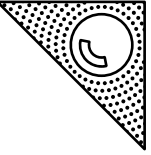


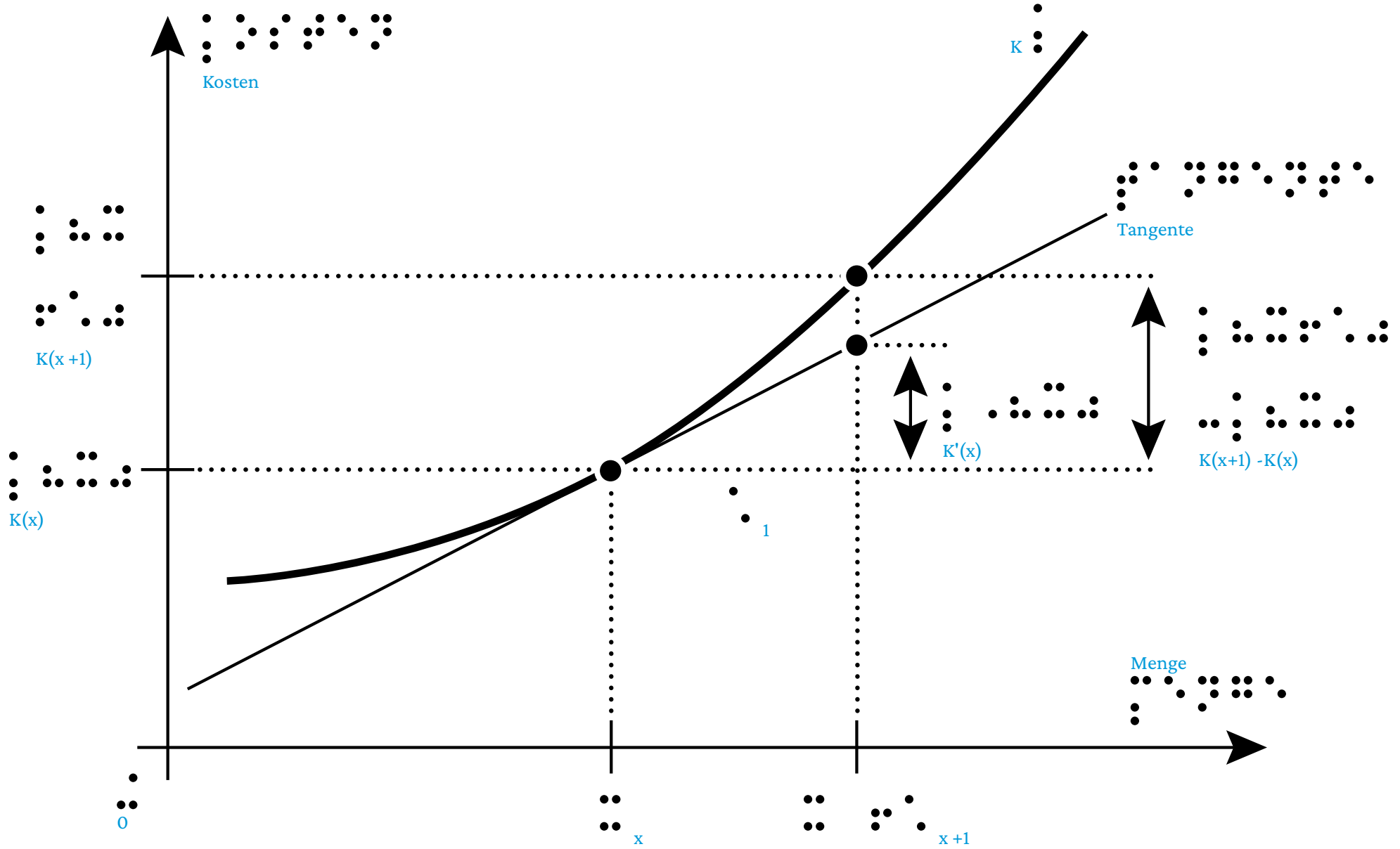
4. Kosten- und Preistheorie

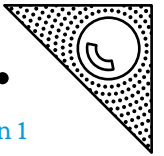
Angewandte Mathematik HAK Band 4

4.

Kosten- und Preistheorie

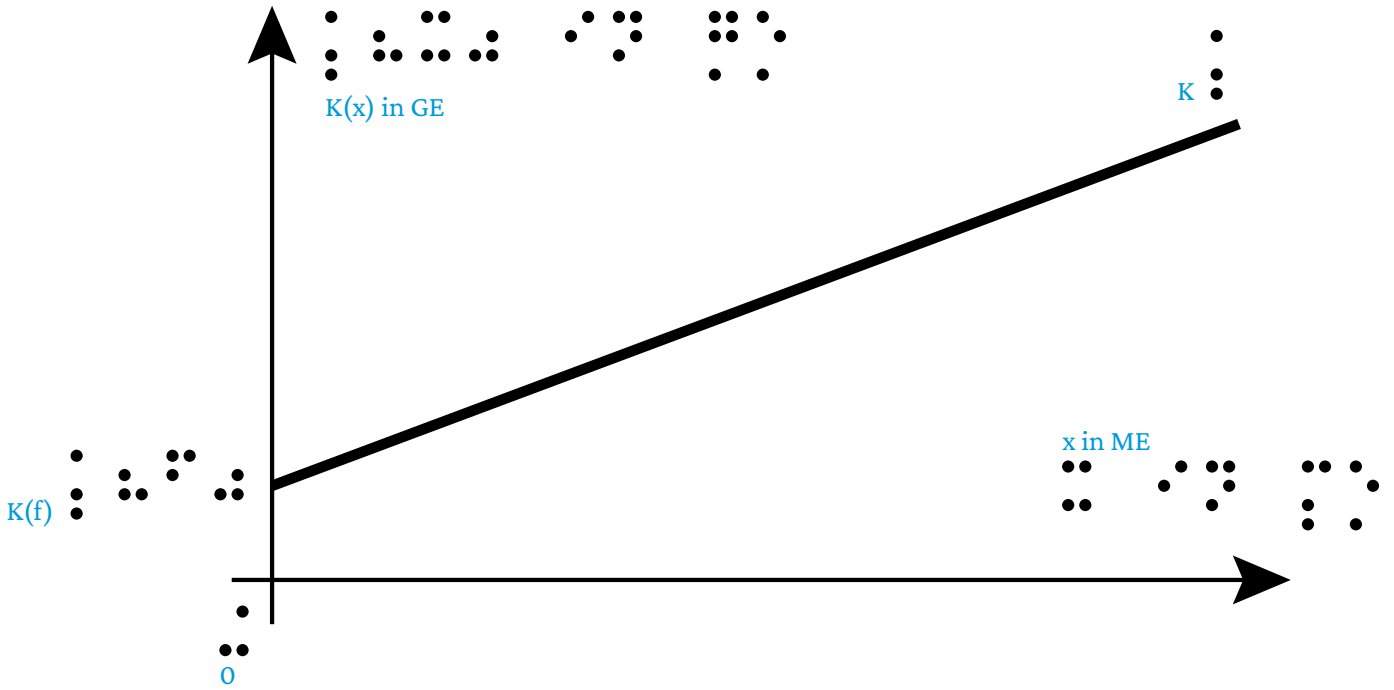






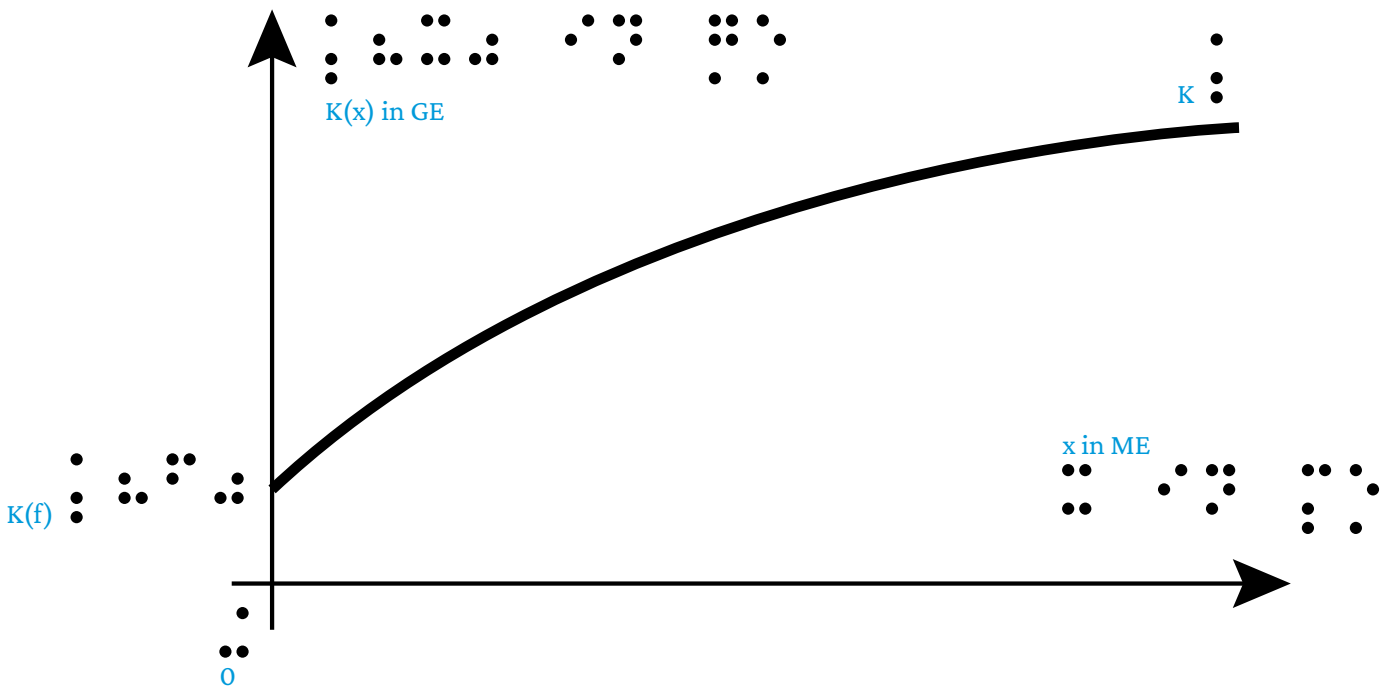
Braille representation of the title 'linear - keine Krümmung'.

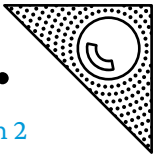
linear - keine Krümmung



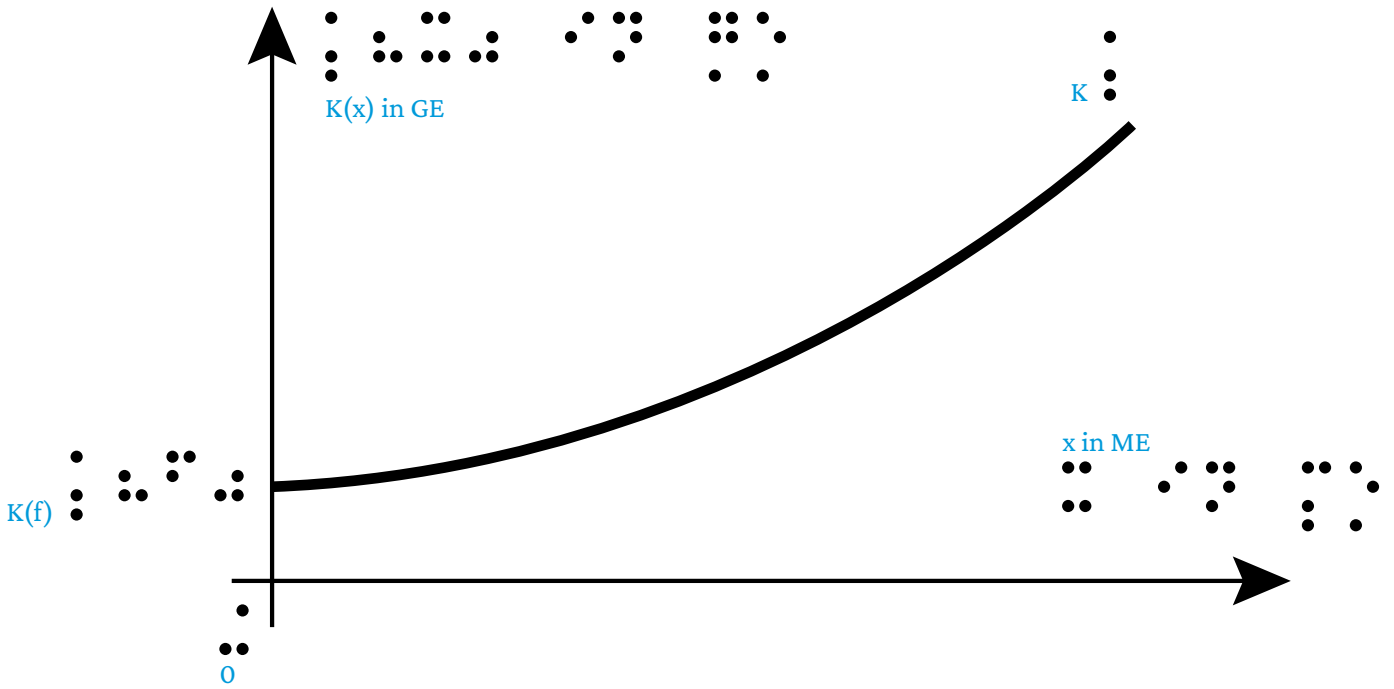
Braille representation of the title 'degressiv - negative Krümmung'.

degressiv - negative Krümmung

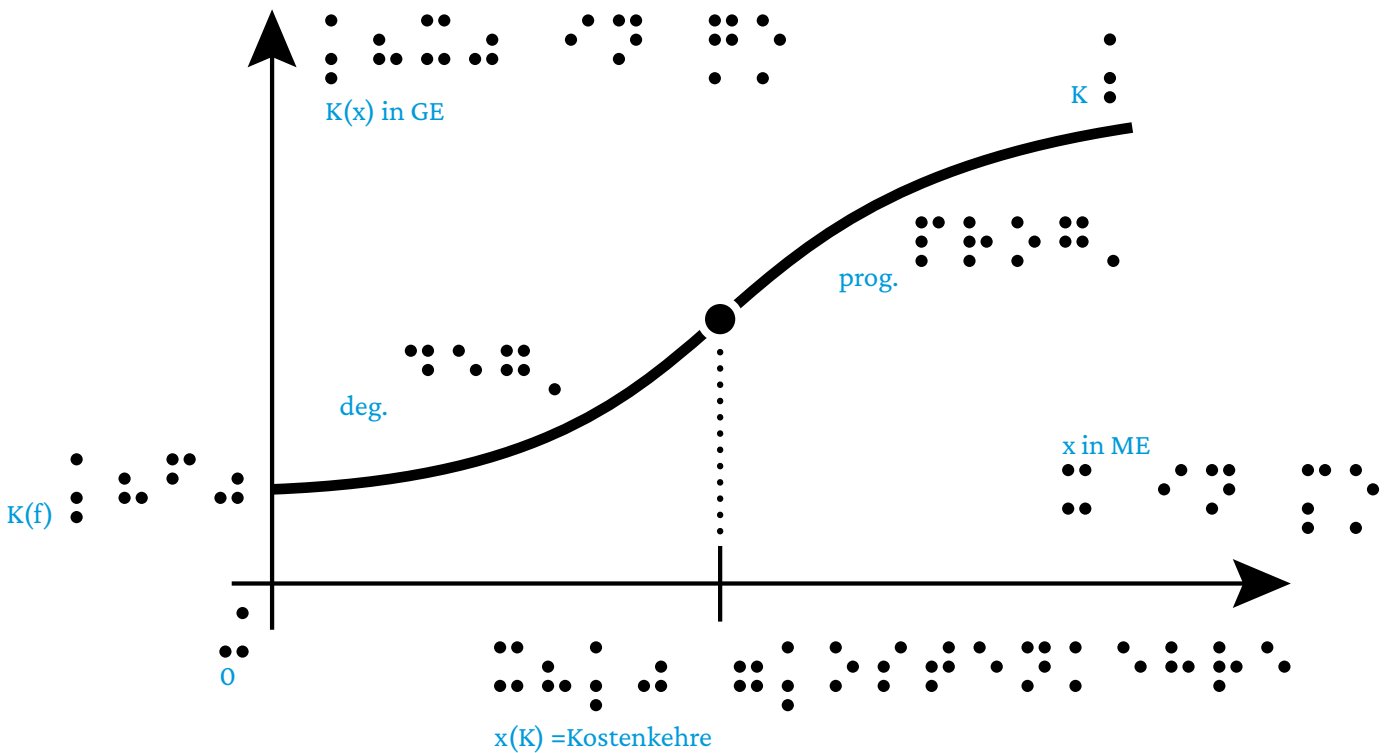


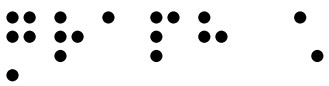
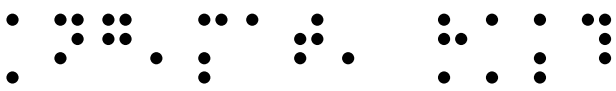


progressiv - positive Krümmung

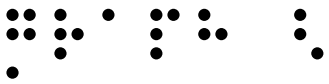
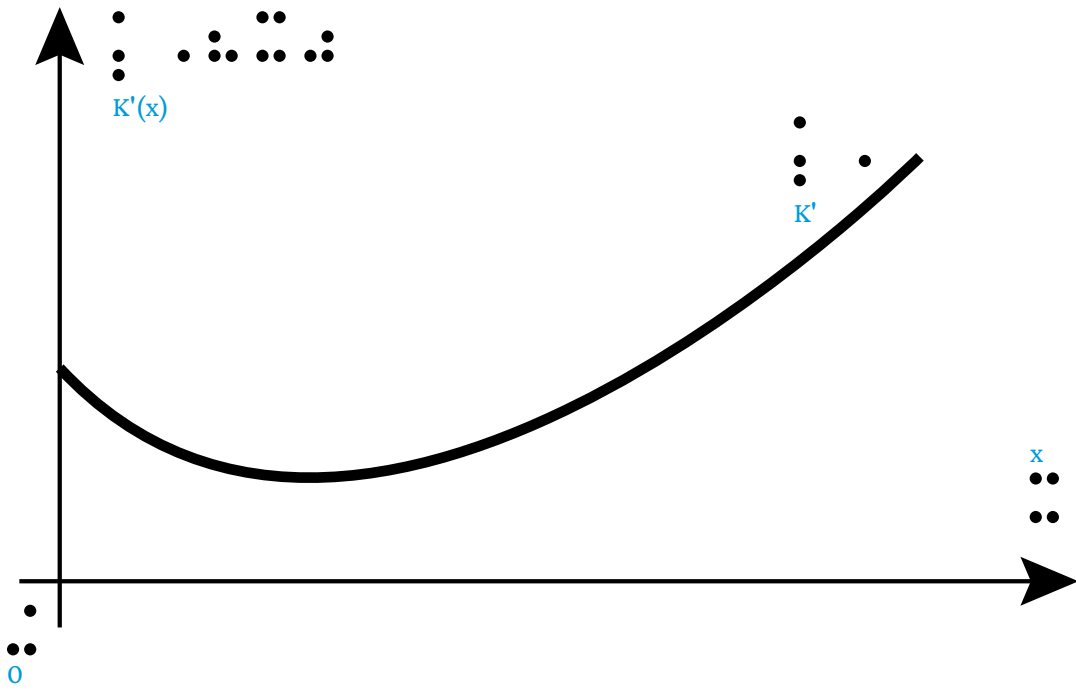


ertragsgesetzlich - zuerst neg., danach pos. Krümmung

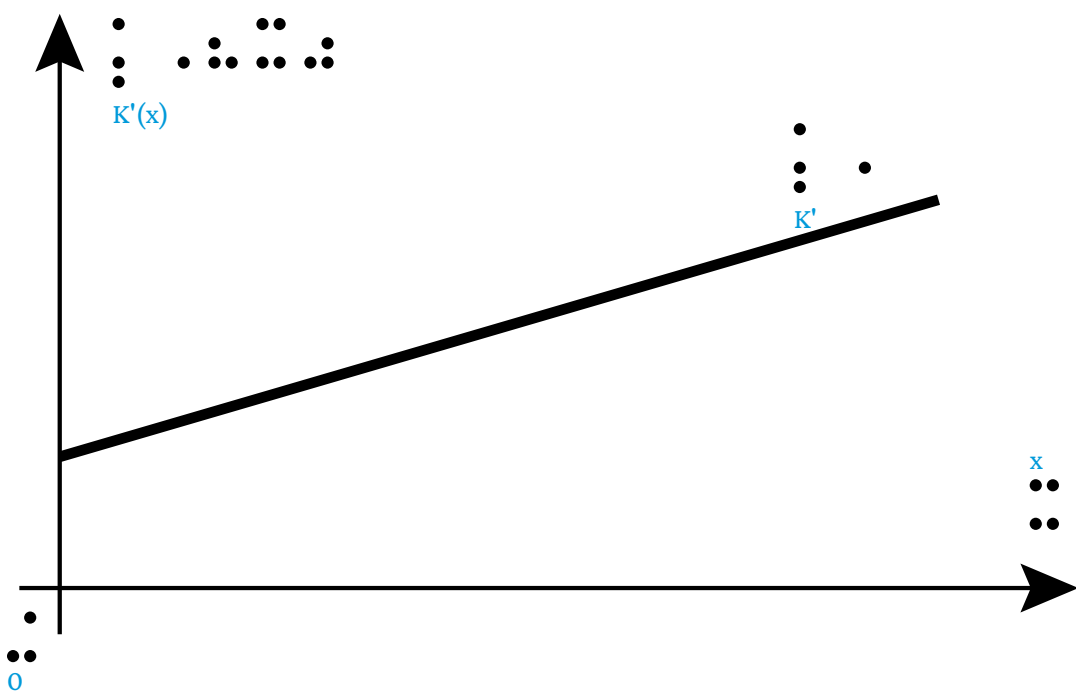


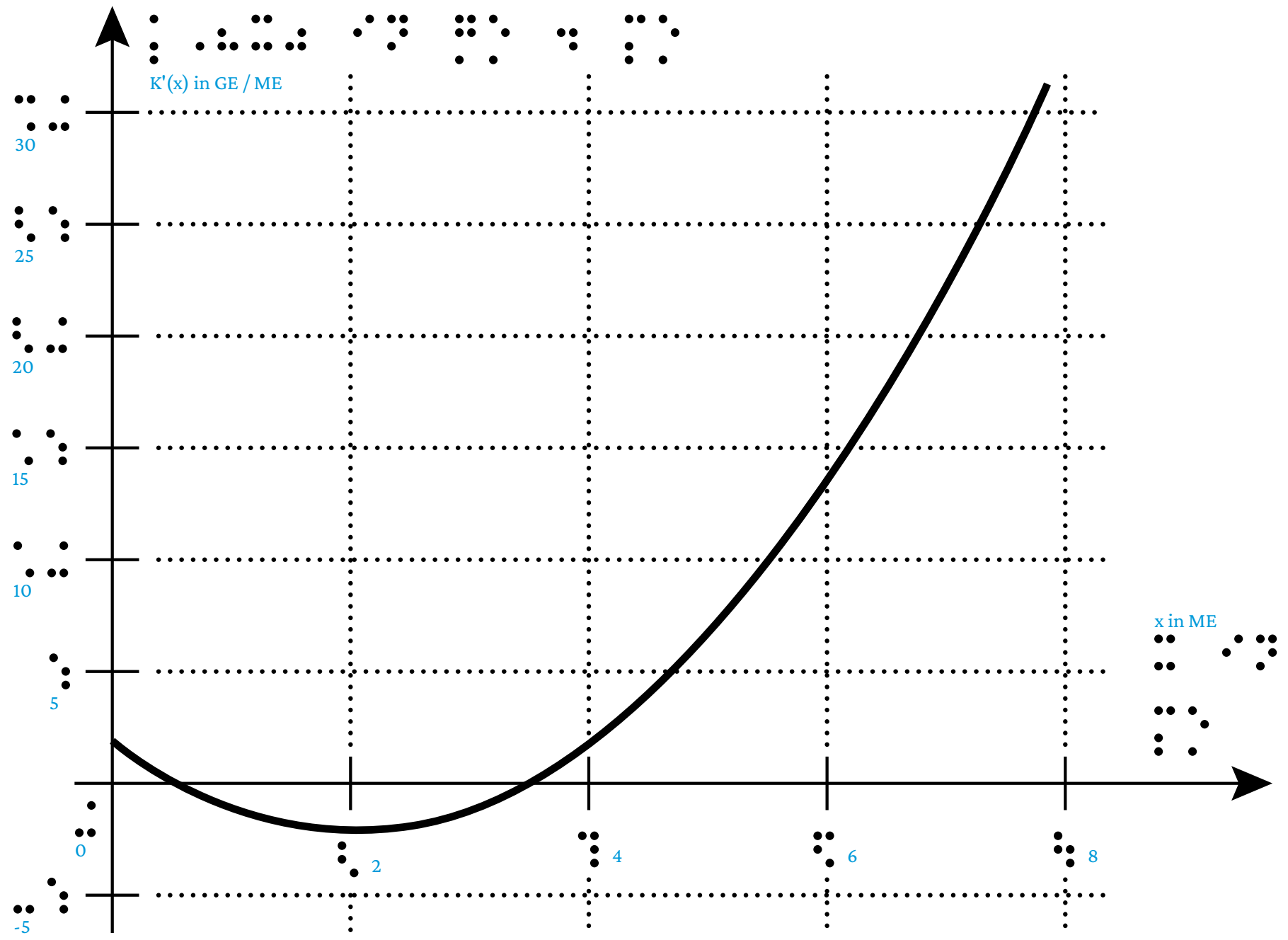
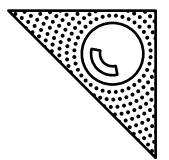


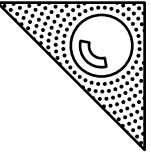
Graph 1



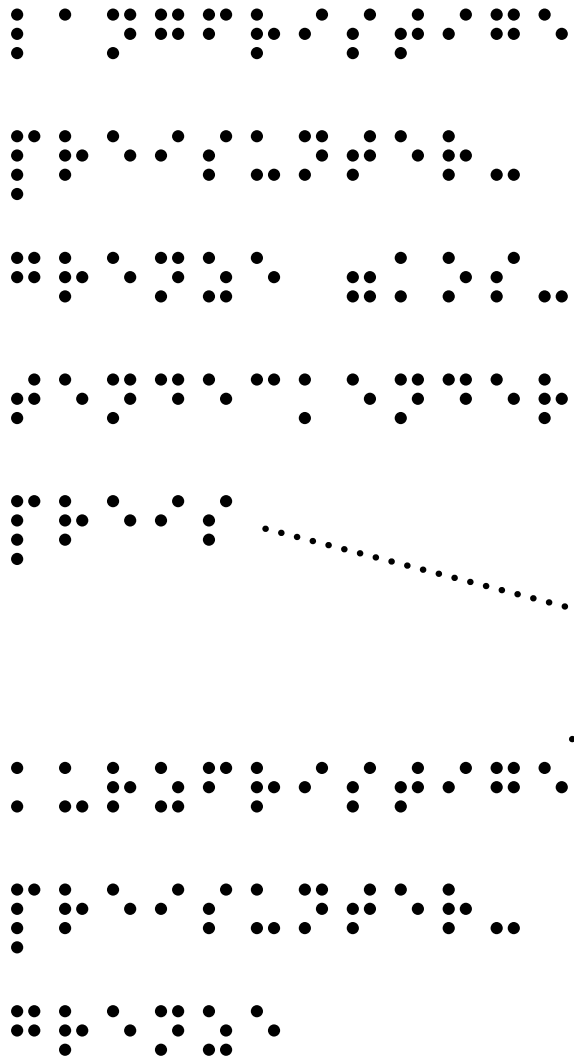
Graph 2



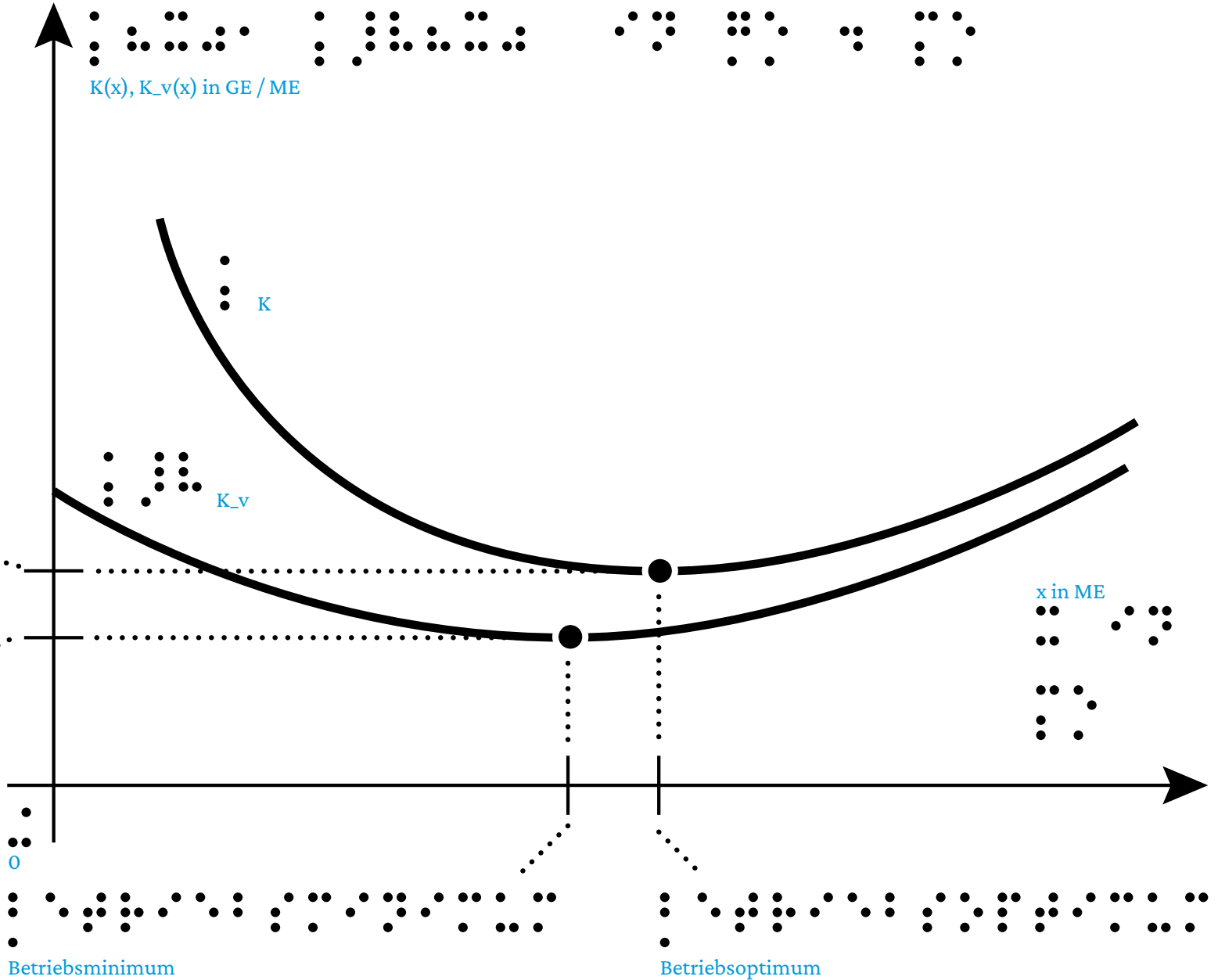




langfristige Preisuntergrenze



kurzfristige Preisuntergrenze



$K(x), K_v(x)$ in GE / ME

K

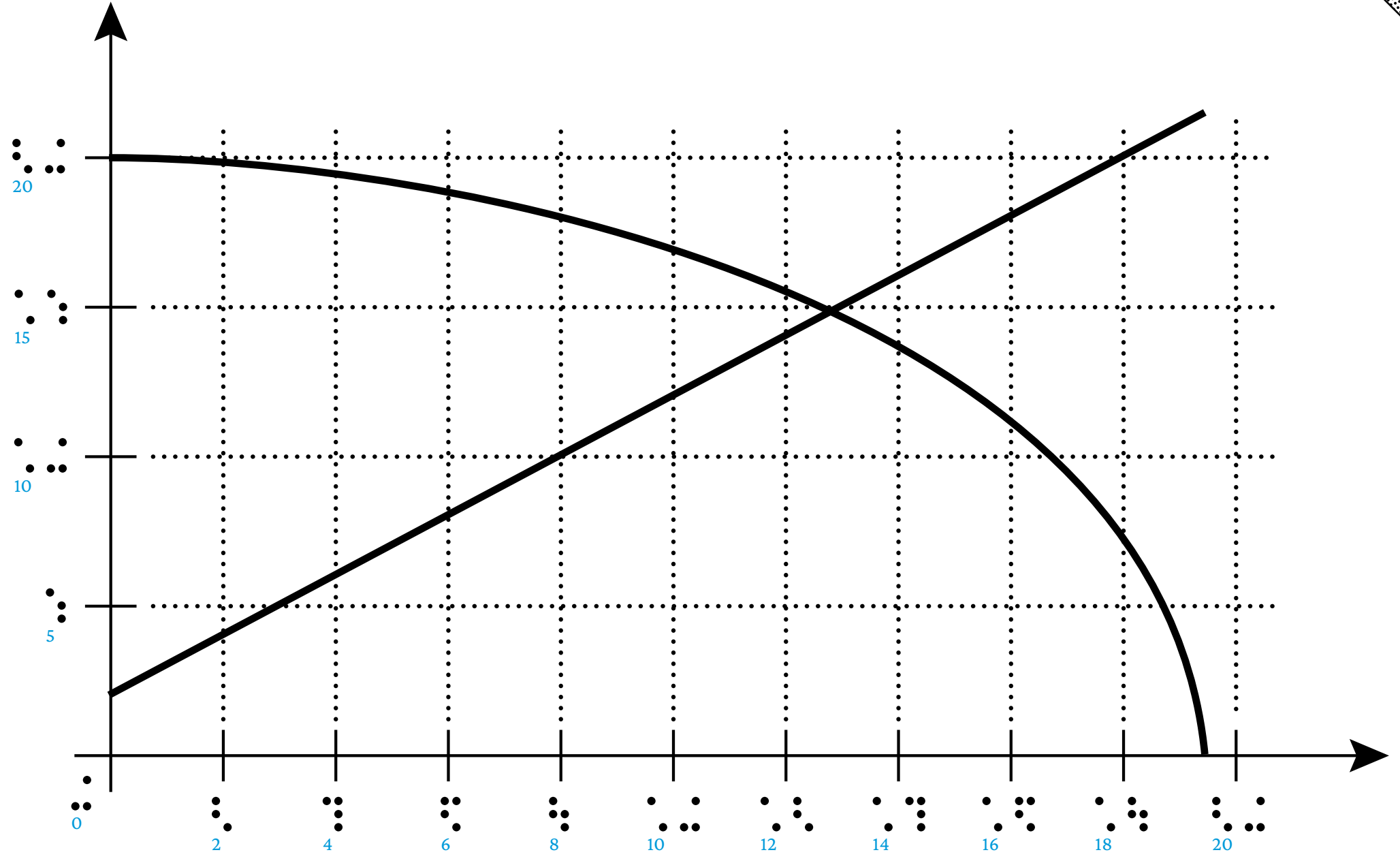
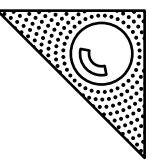
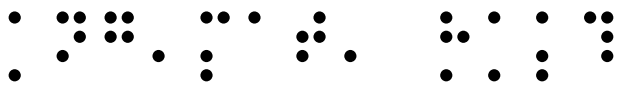
K_v

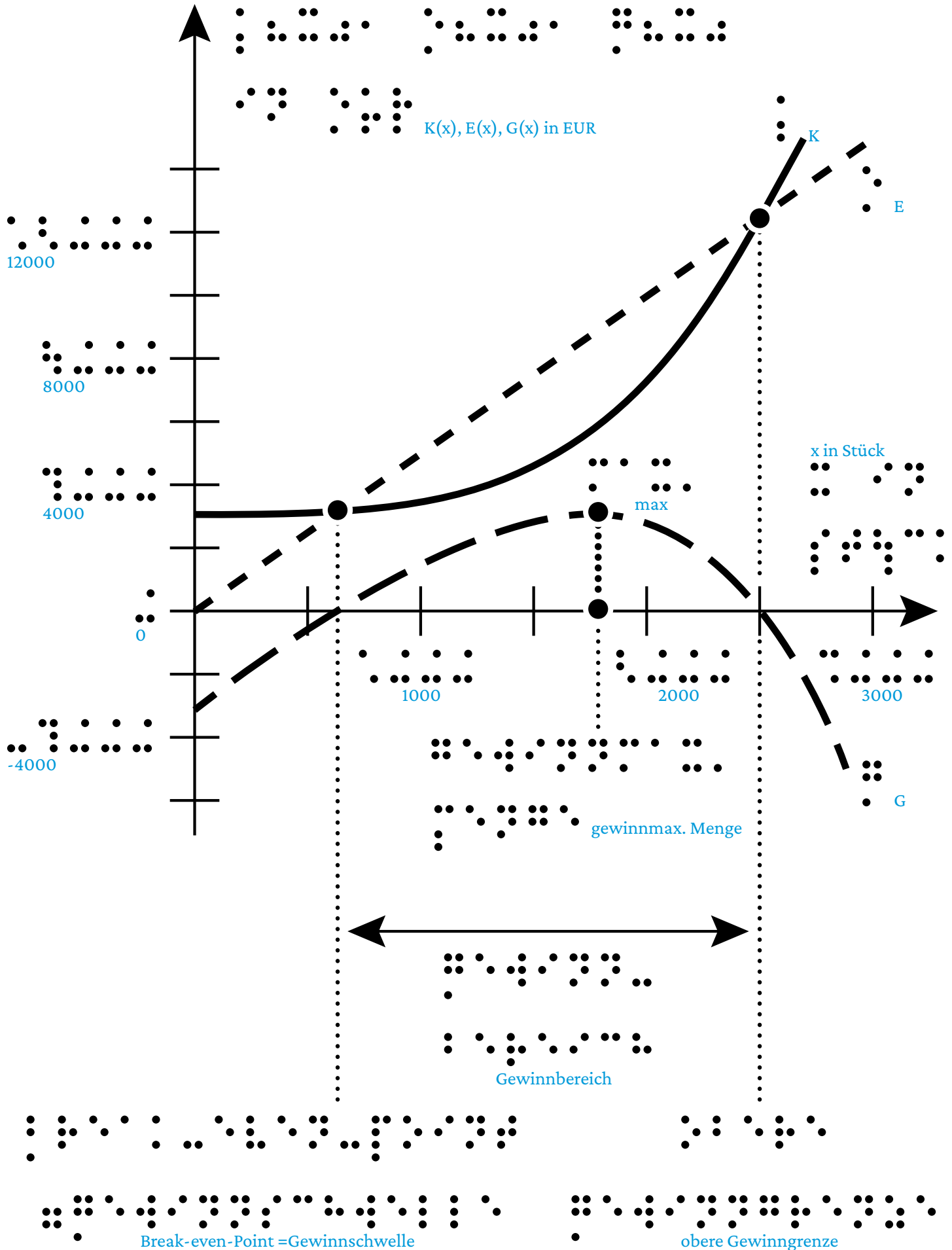
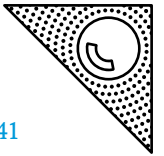
x in ME

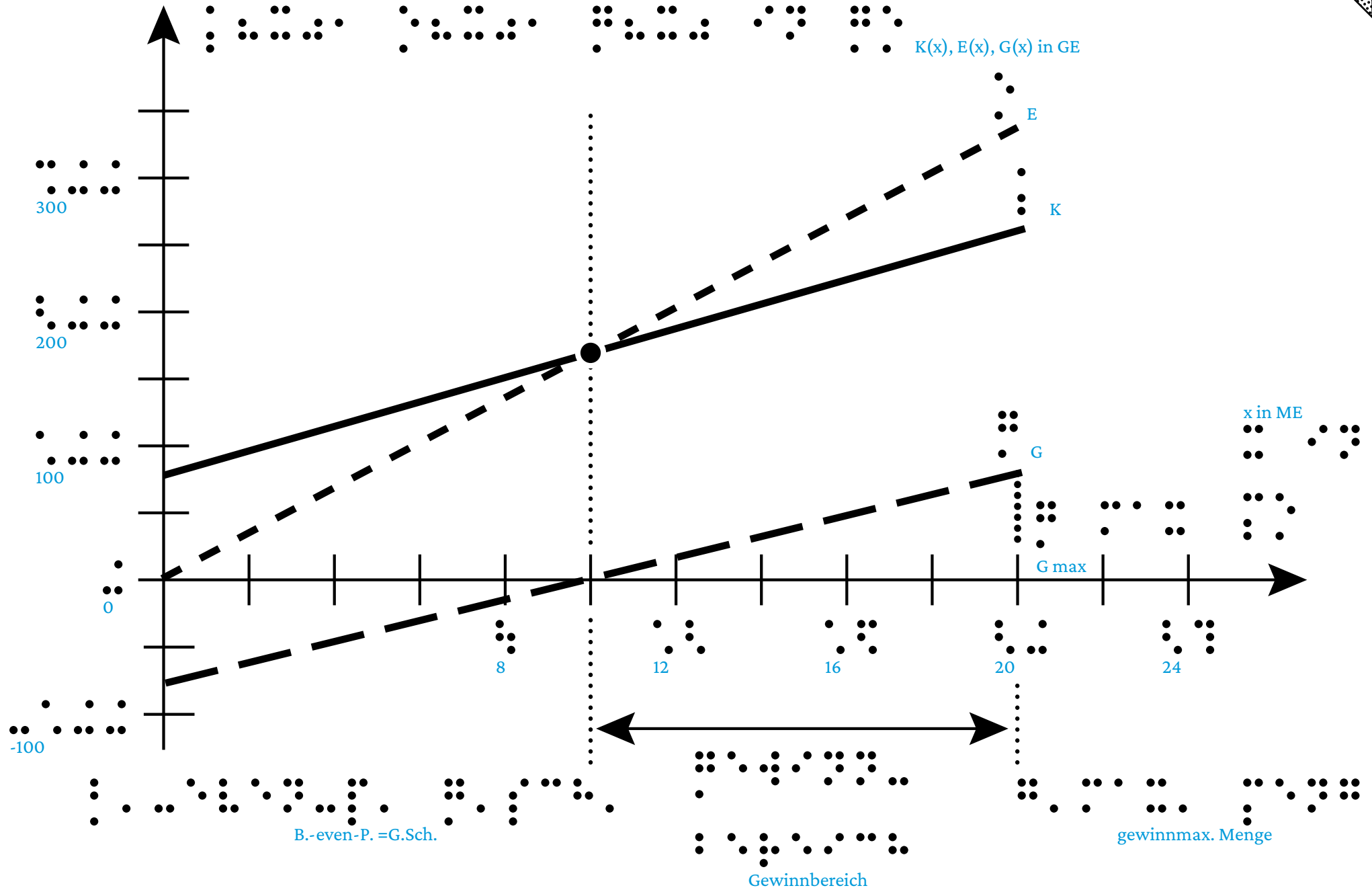
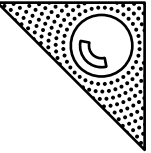
0

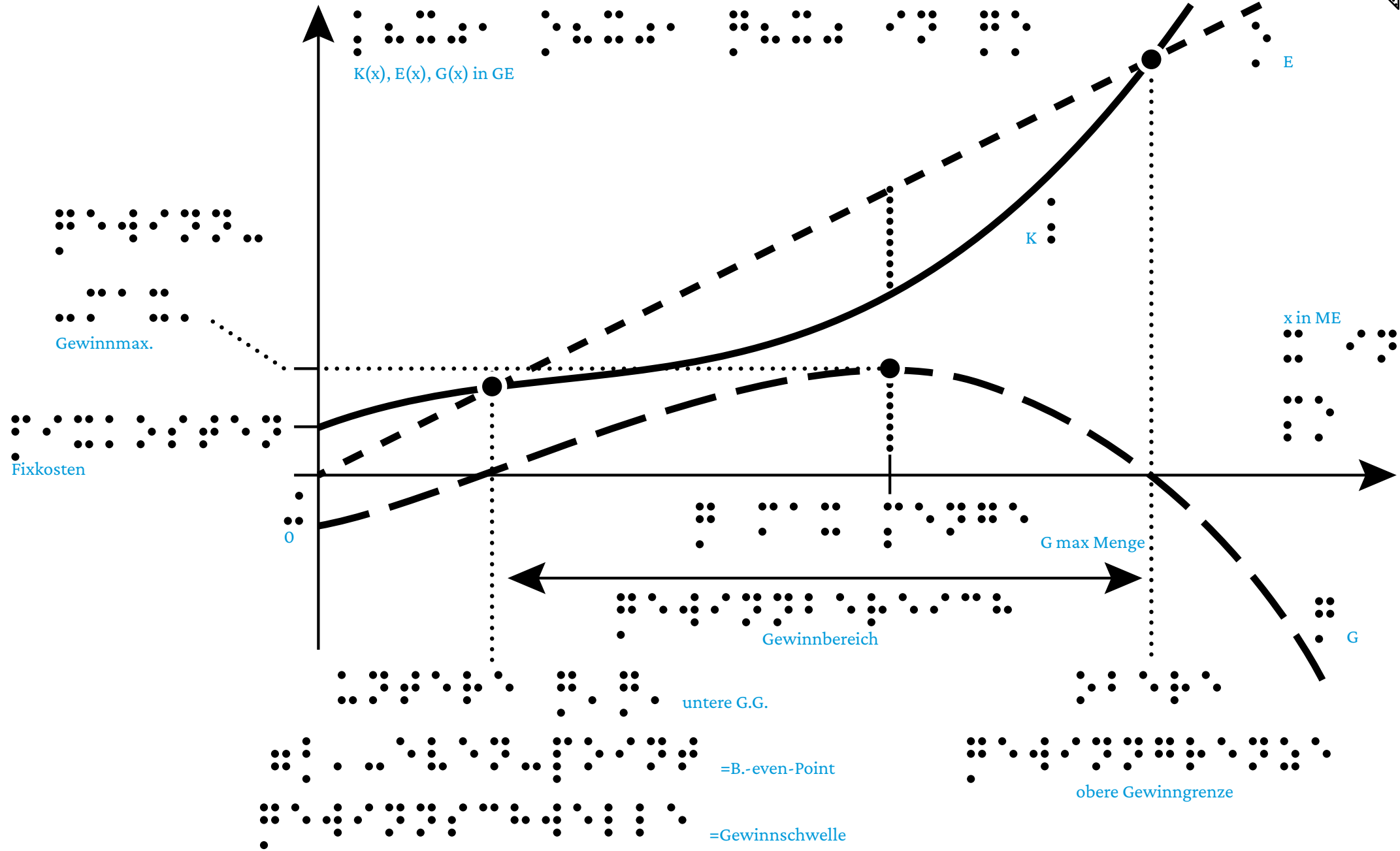
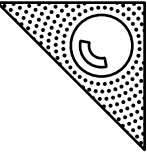
Betriebsminimum

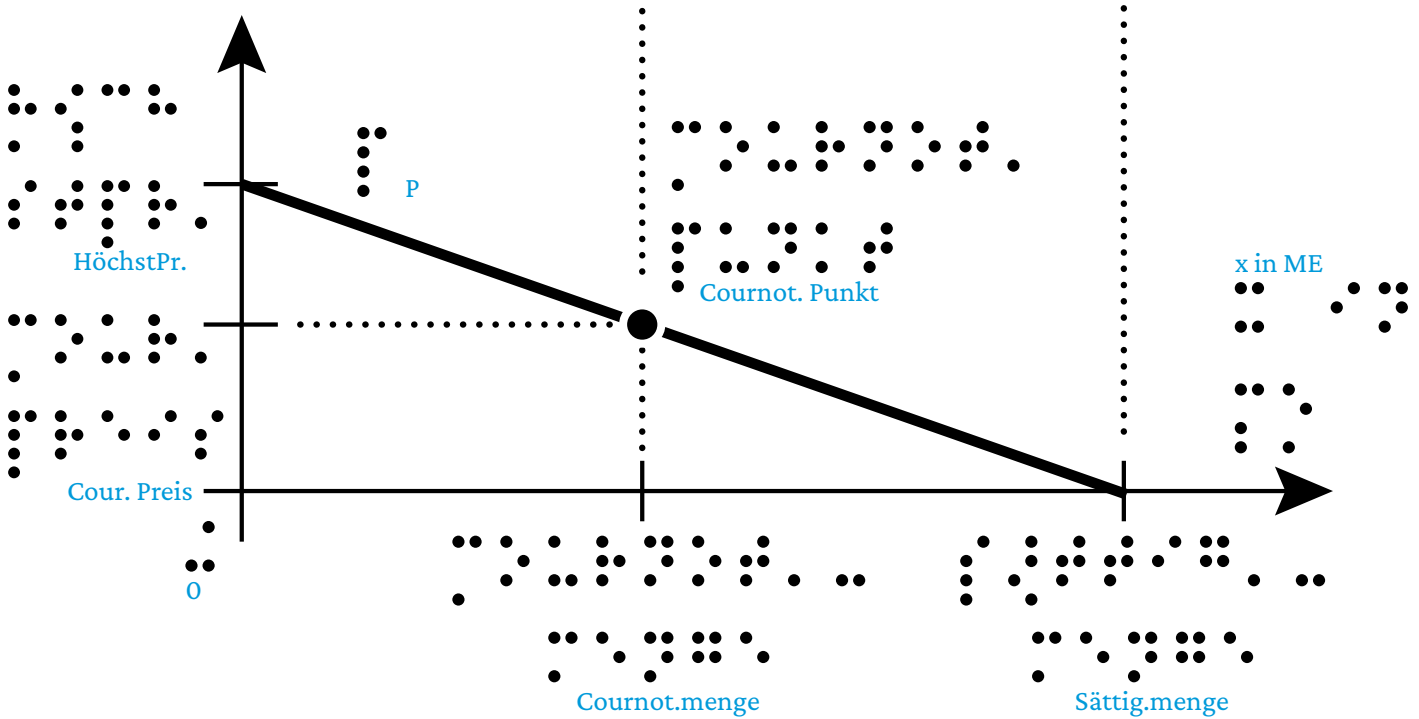
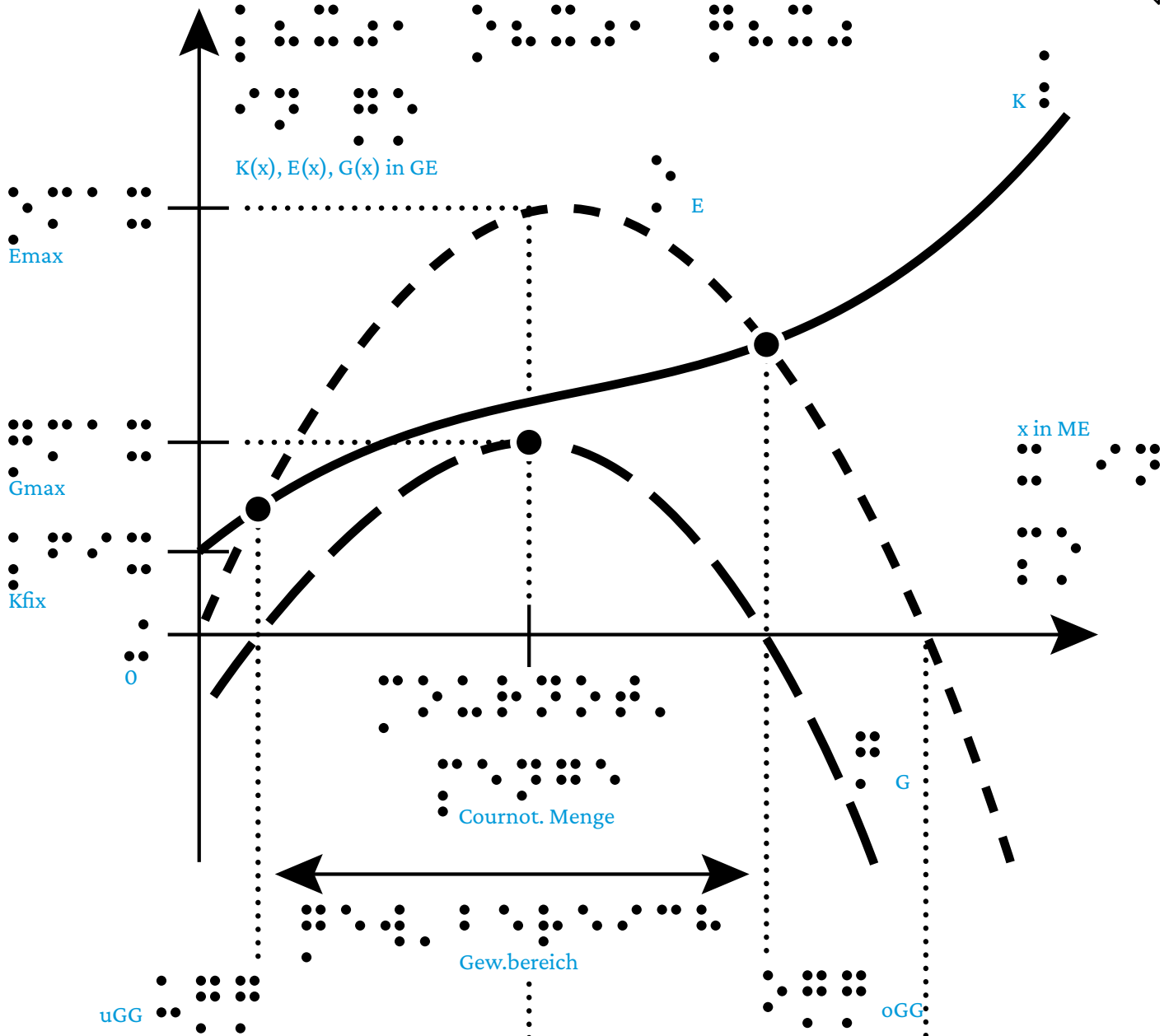
Betriebsoptimum

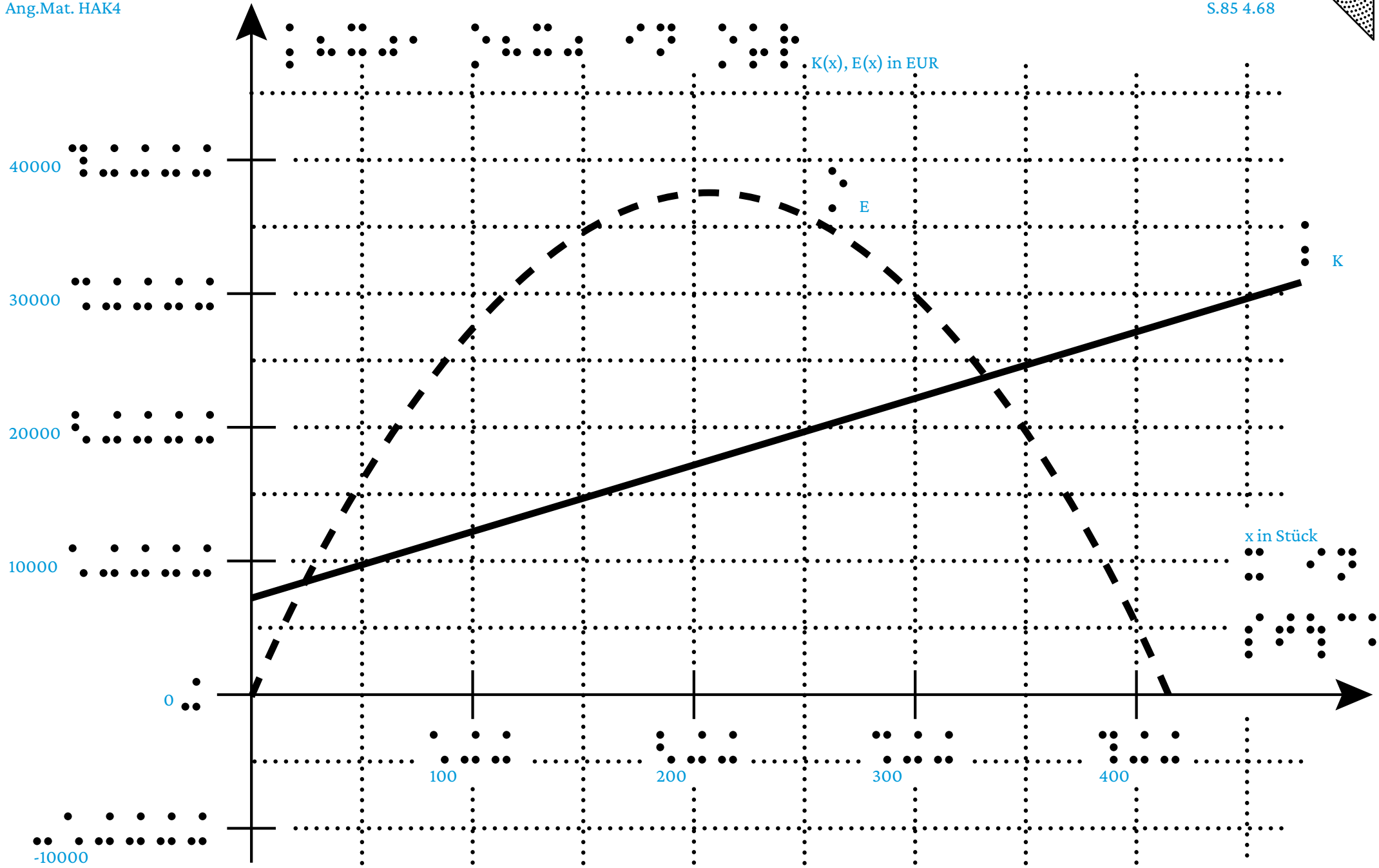
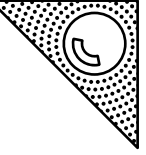


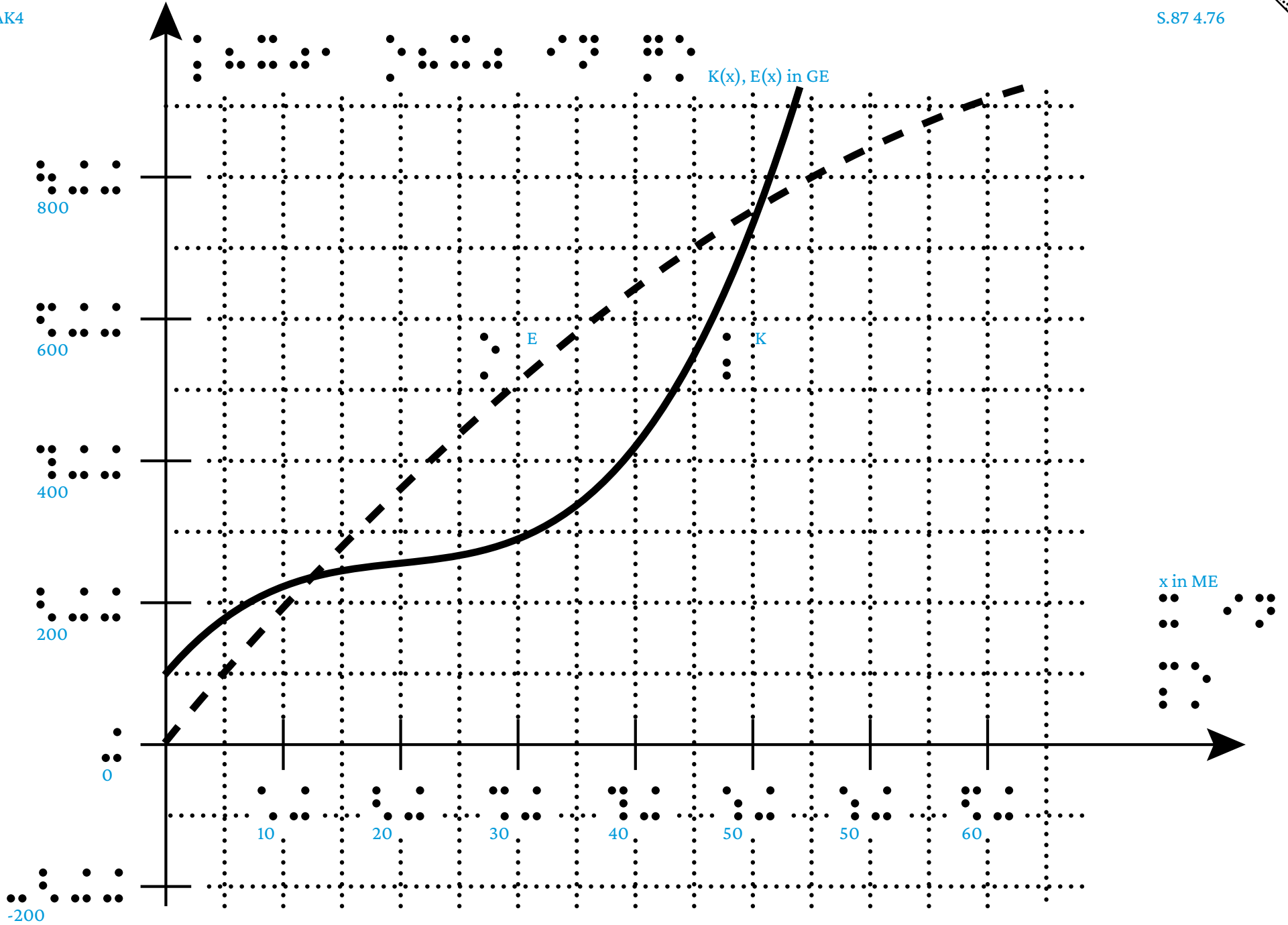
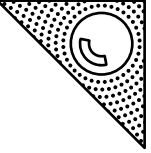


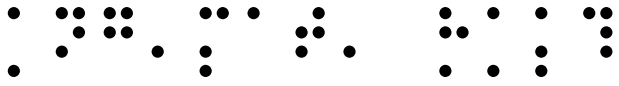
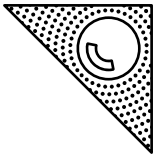




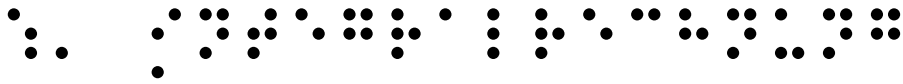








Ang.Mat. HAK4

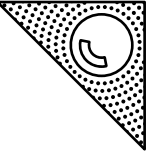


5. Integralrechnung

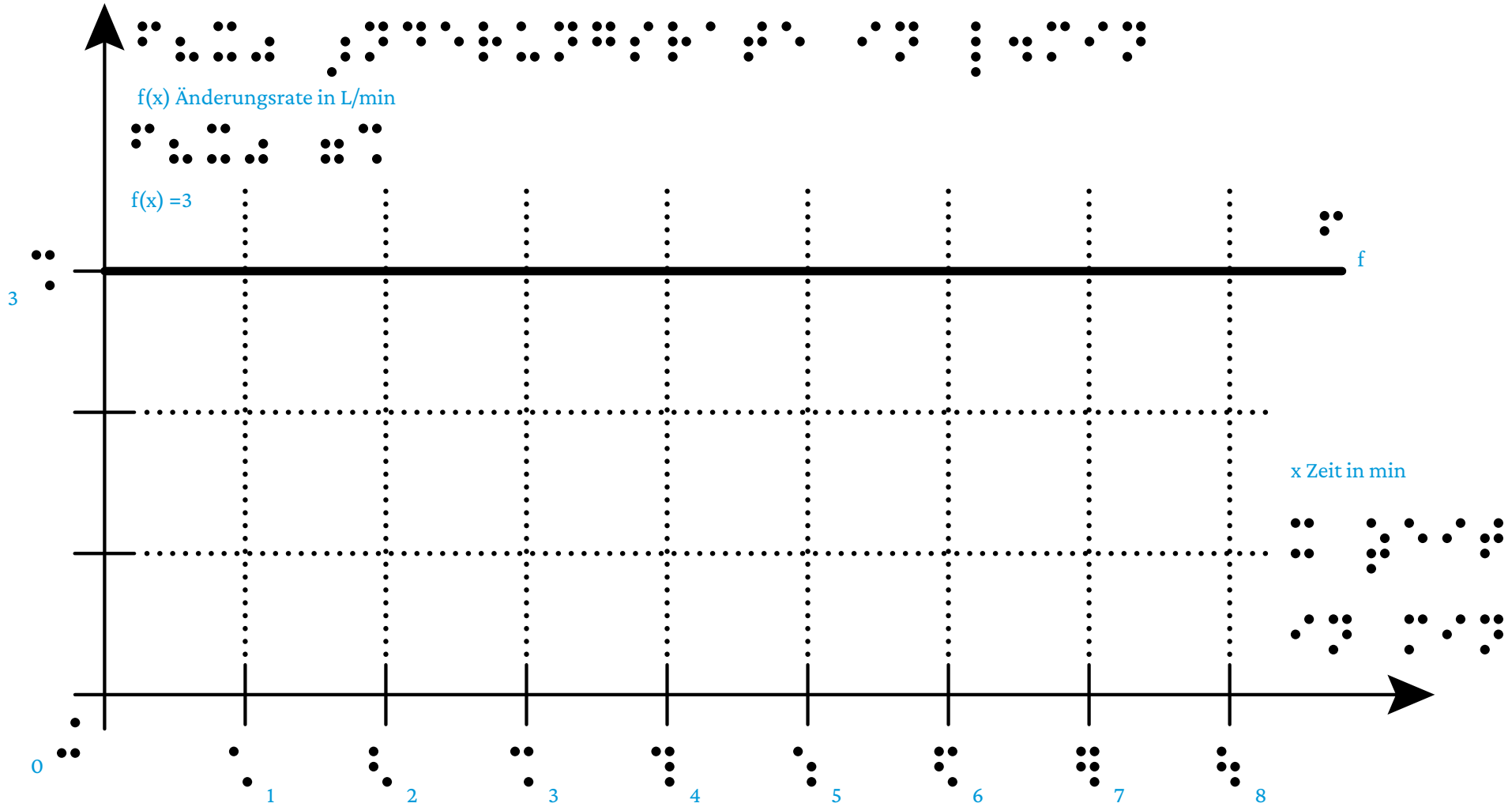
Angewandte Mathematik HAK Band 4

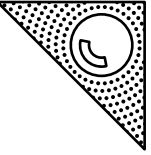
5.

Integralrechnung

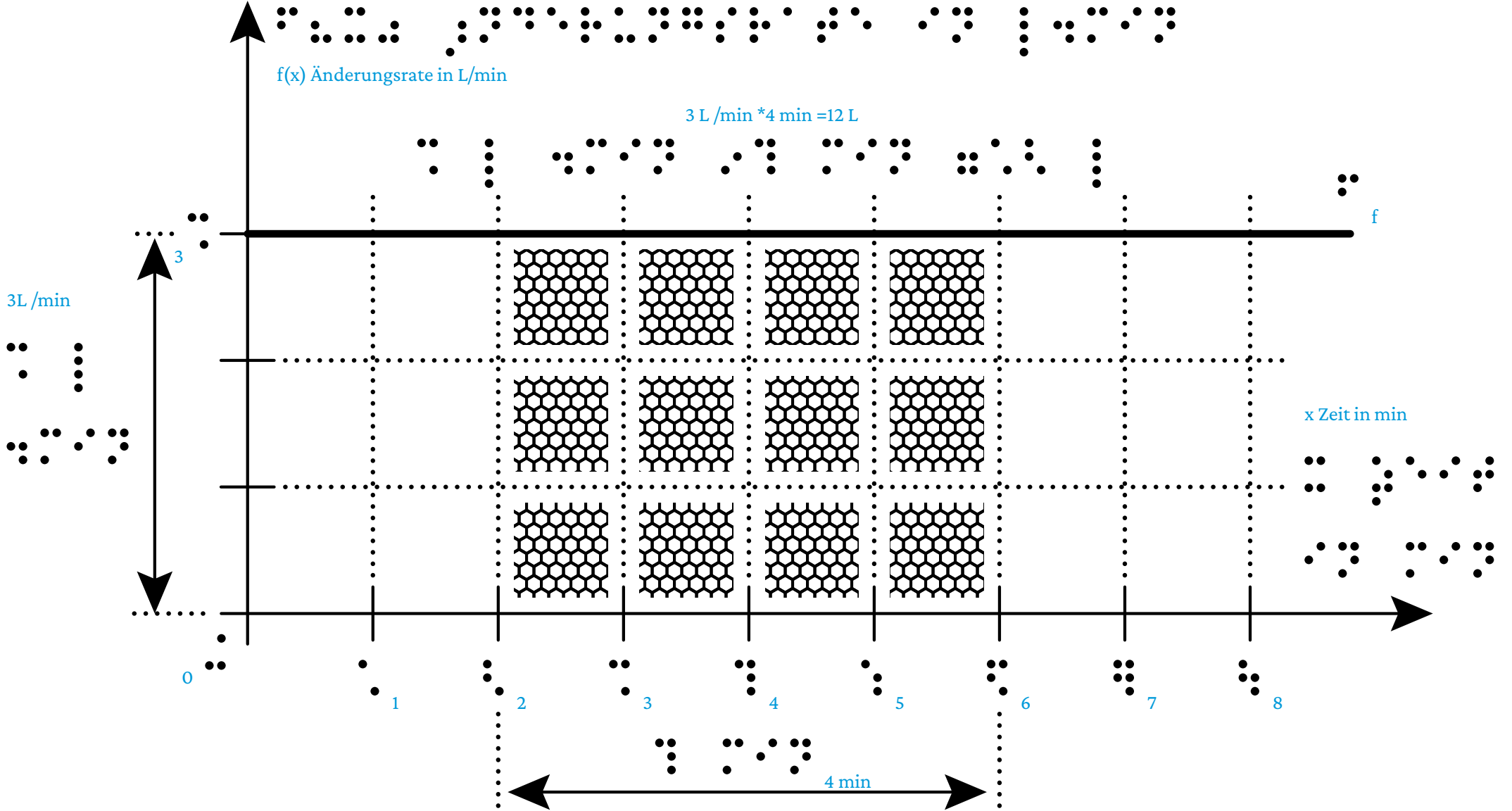


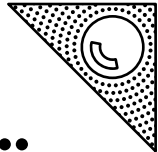
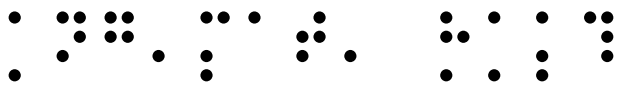
Beispiel mit konstanter Zuflussrate:



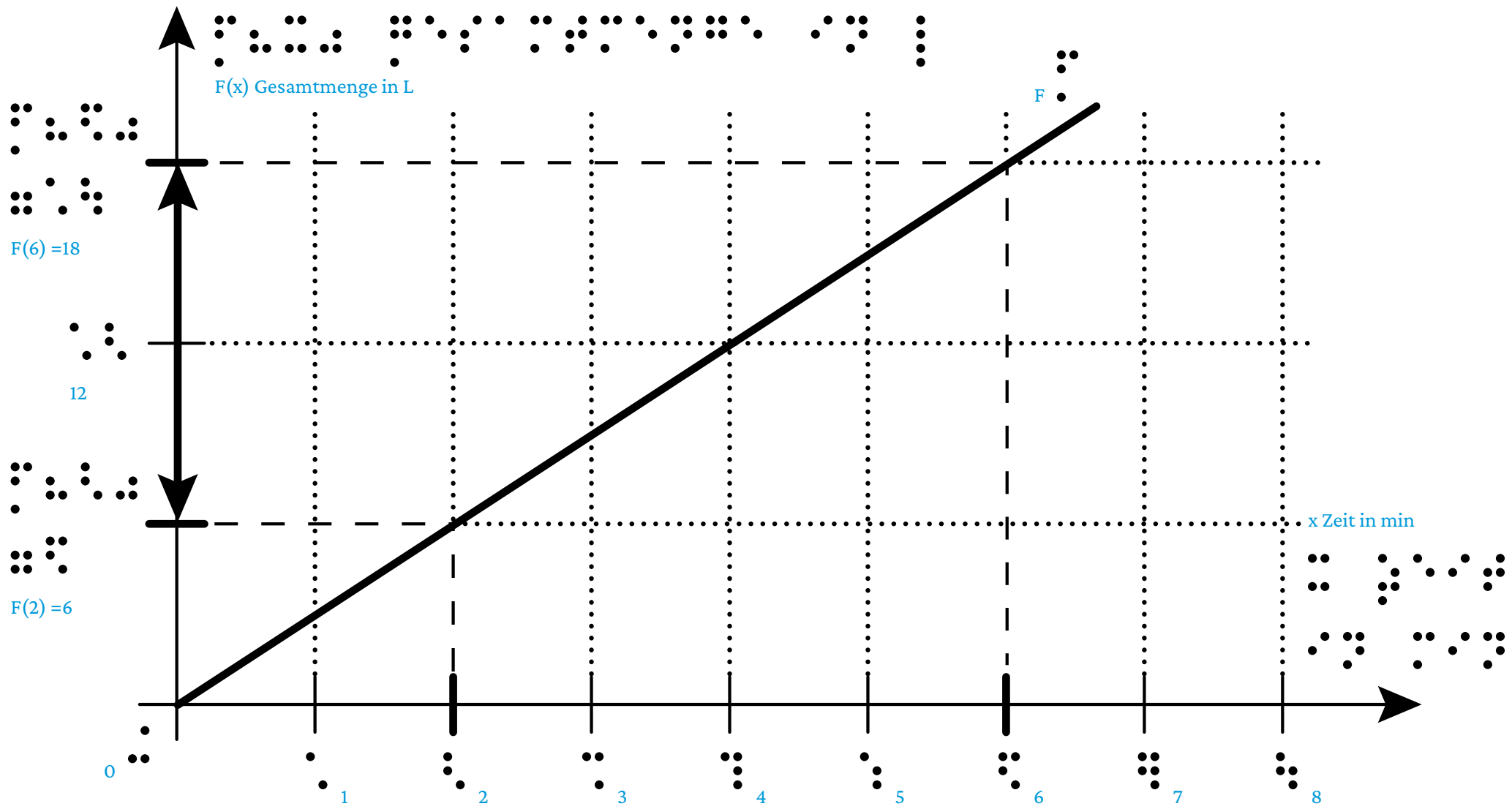


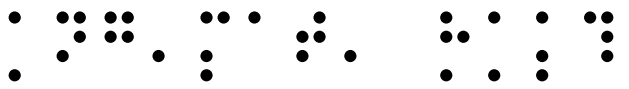
Zuflussmenge als Flächeninhalt:



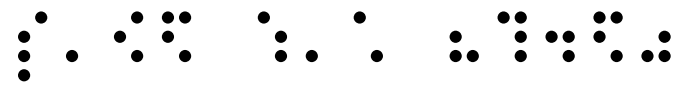


Zuflussmenge mithilfe der Bestandsfunktion

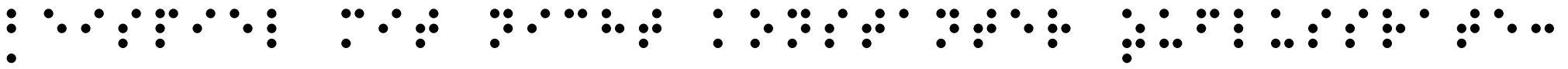
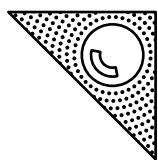




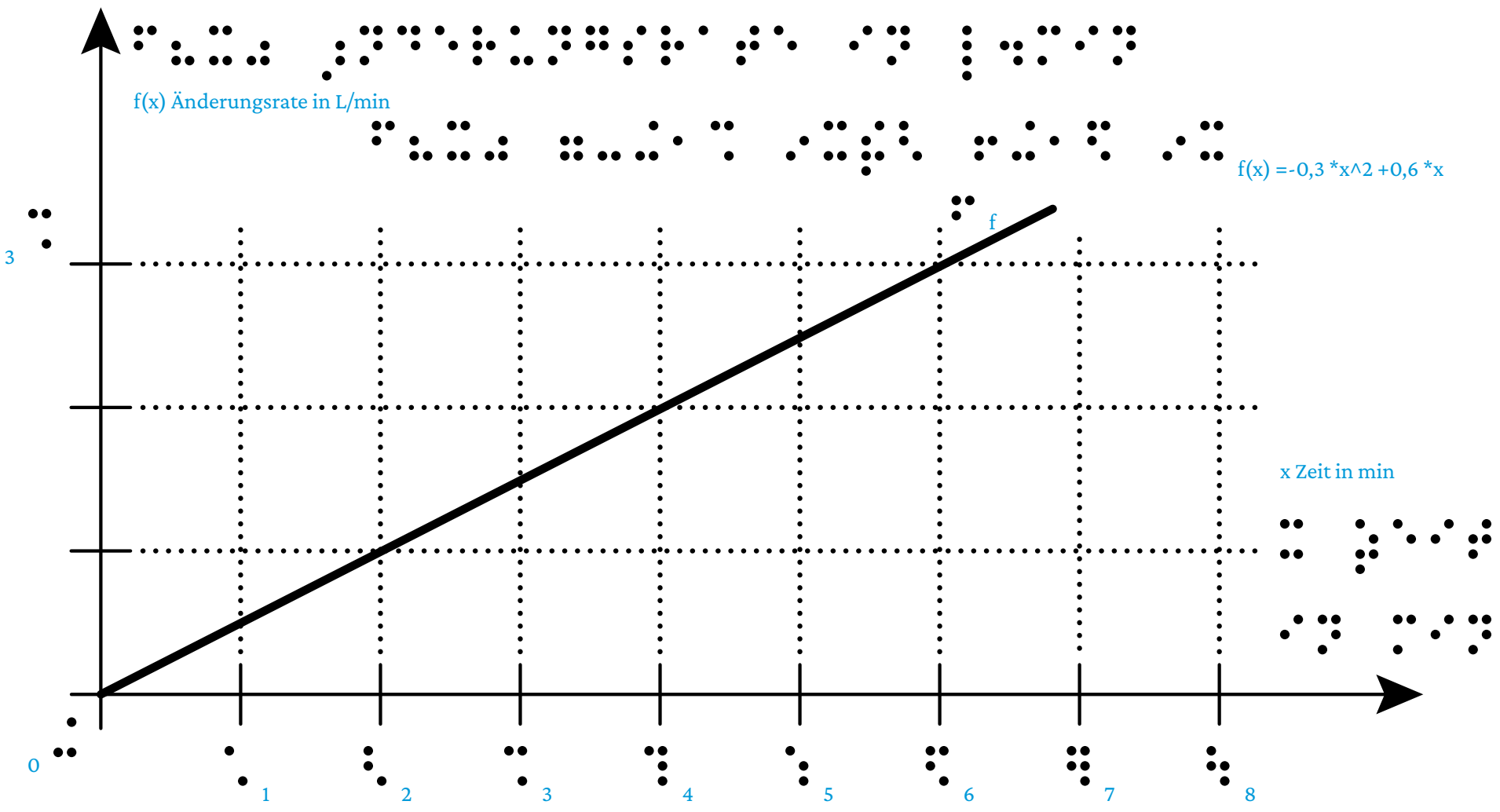
Ang.Mat. HAK4

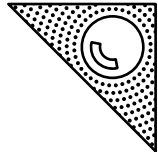
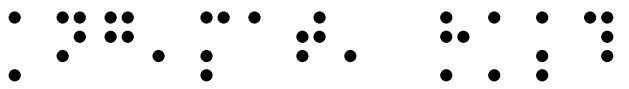


S.96 5.1 (4/6)

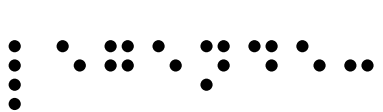
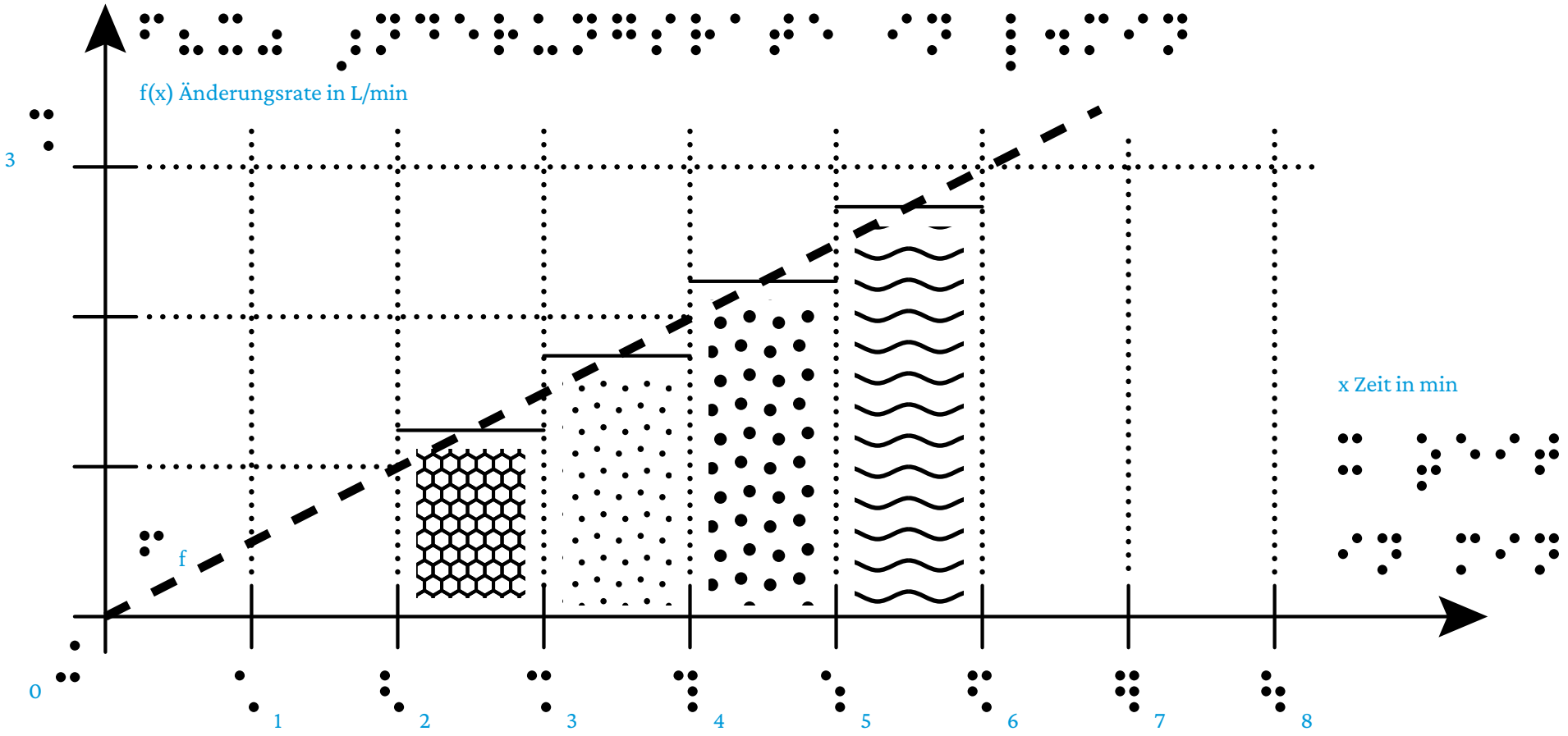


Beispiel mit nicht konstanter Zuflussrate:

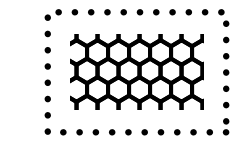




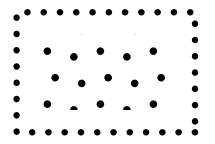
Zuflussmenge als Flächeninhalt:



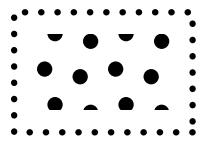
Legende:



1,3 *1



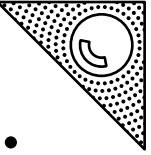
1,7 *1



2,1 *1



2,4 *1



Zuflussmenge mithilfe der Bestandsfunktion

$F(x)$ Gesamtmenge in L

F

10

$F(6) = 8,64$

5

x Zeit in min

$F(2) = 1,2$

0

1

2

3

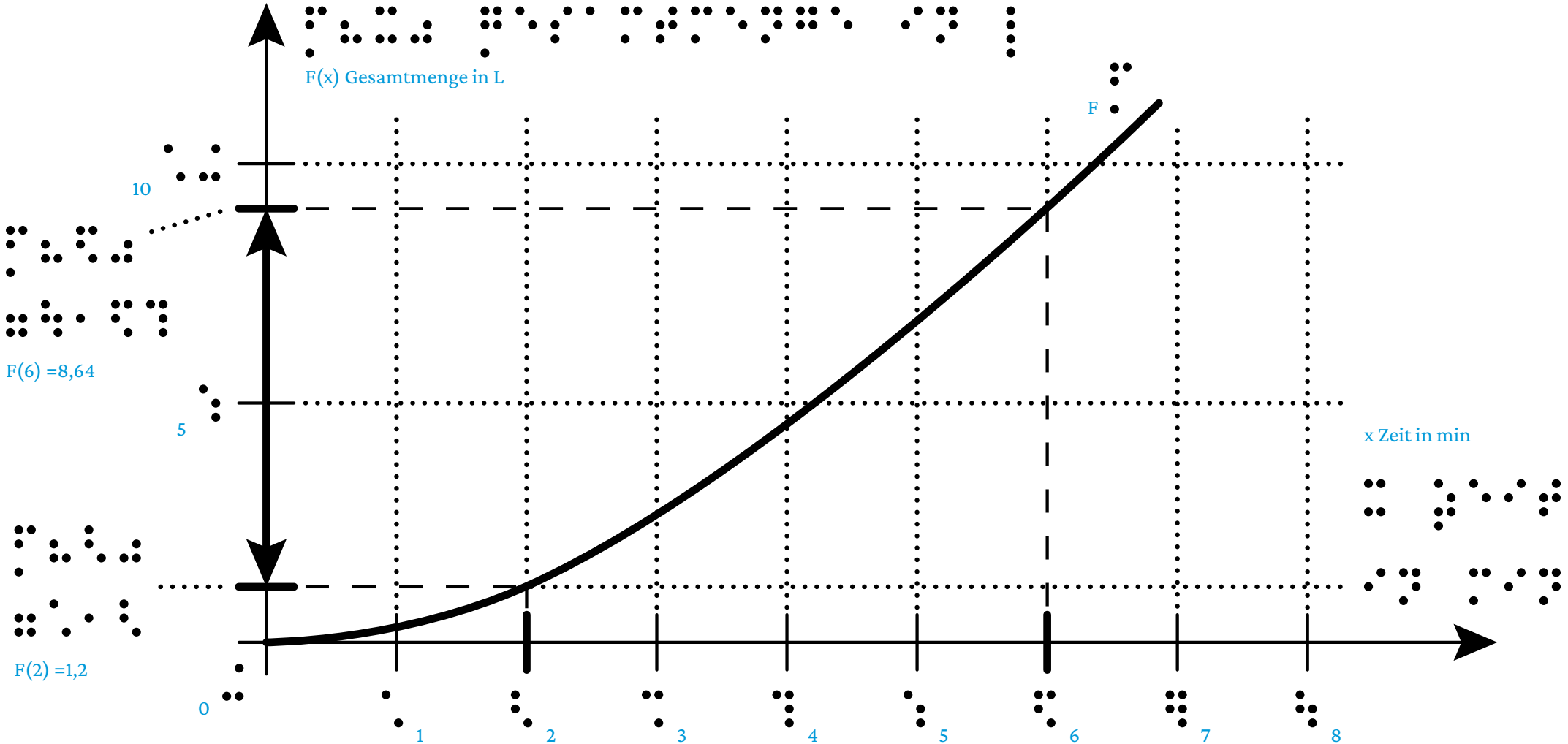
4

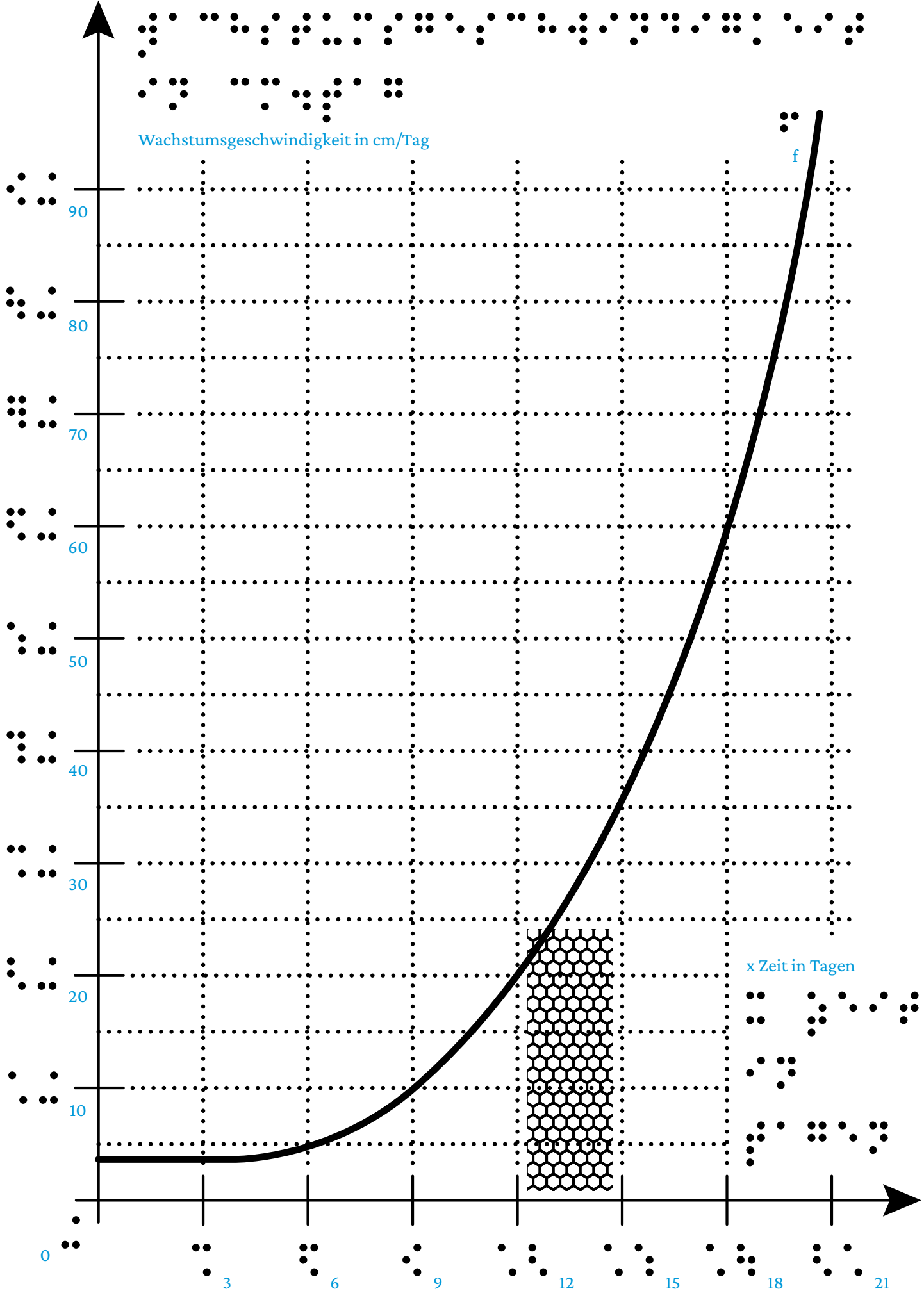
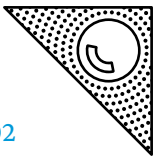
5

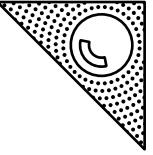
6

7

8







$f(x)$ Durchflussrate in m^3/min

1. Halbzeit

Pause

2. Halbzeit

f

x Zeit in min

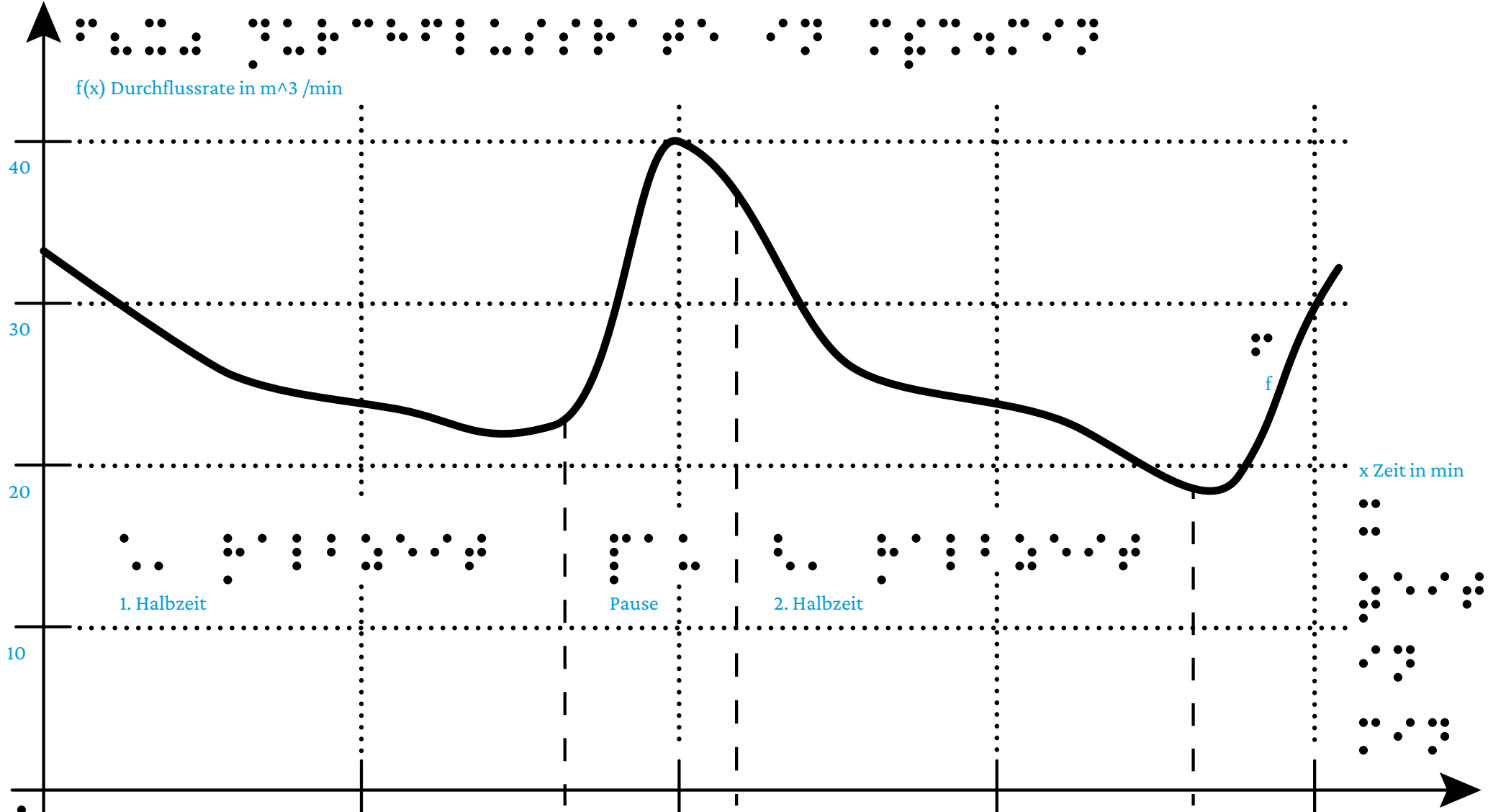
0

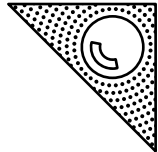
30

60

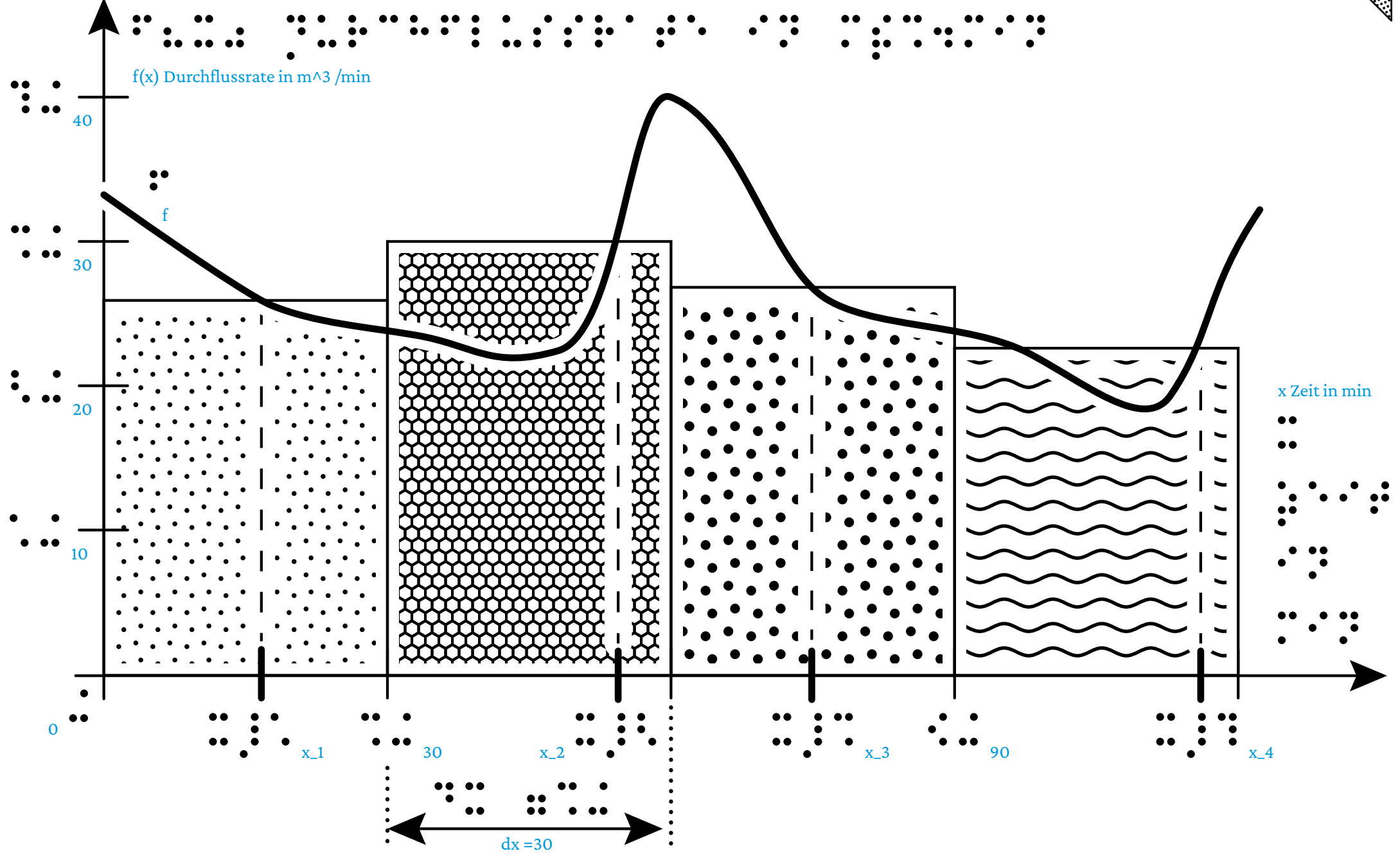
90

120





$f(x)$ Durchflussrate in m^3 / min



f

x Zeit in min

x_1

30

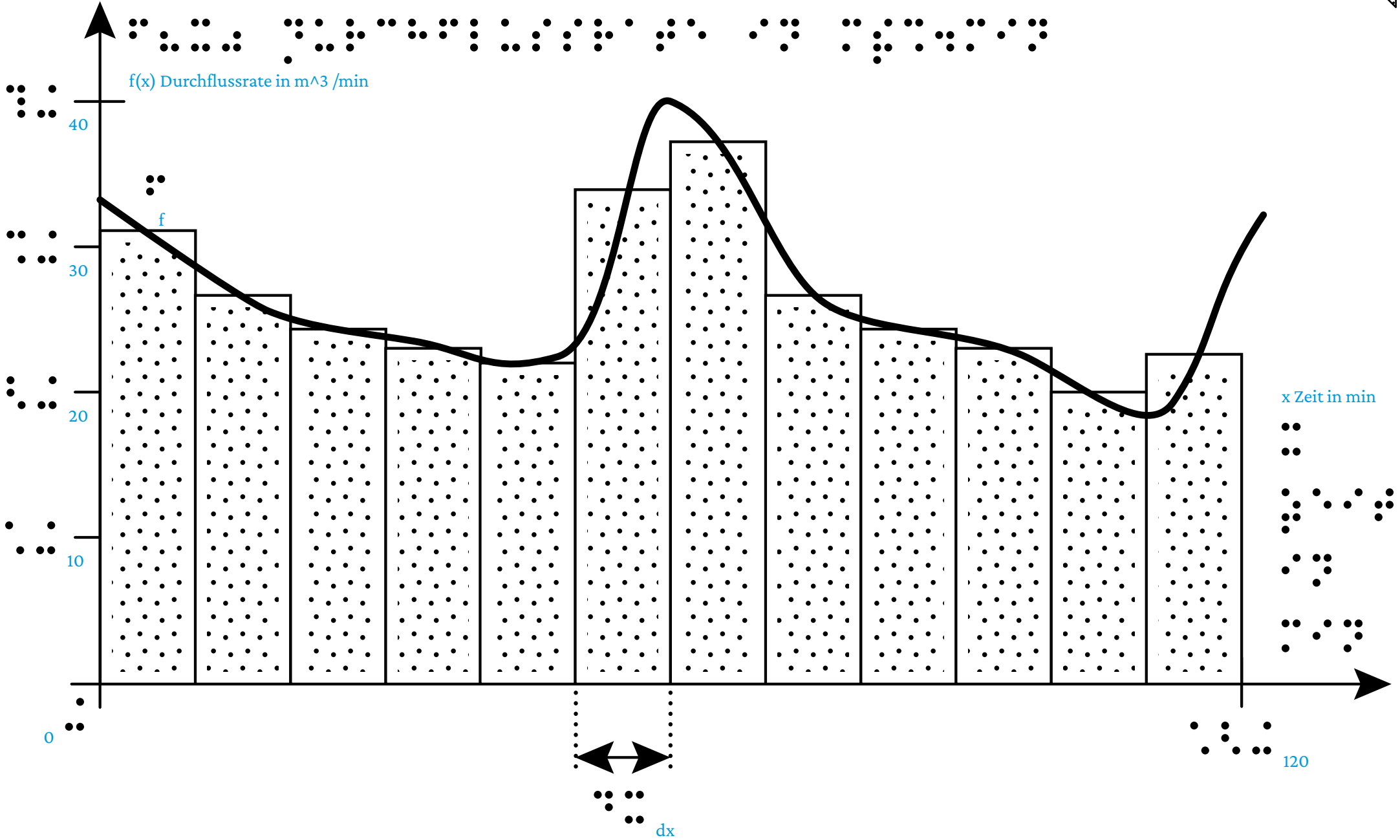
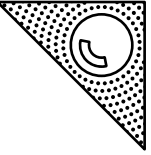
x_2

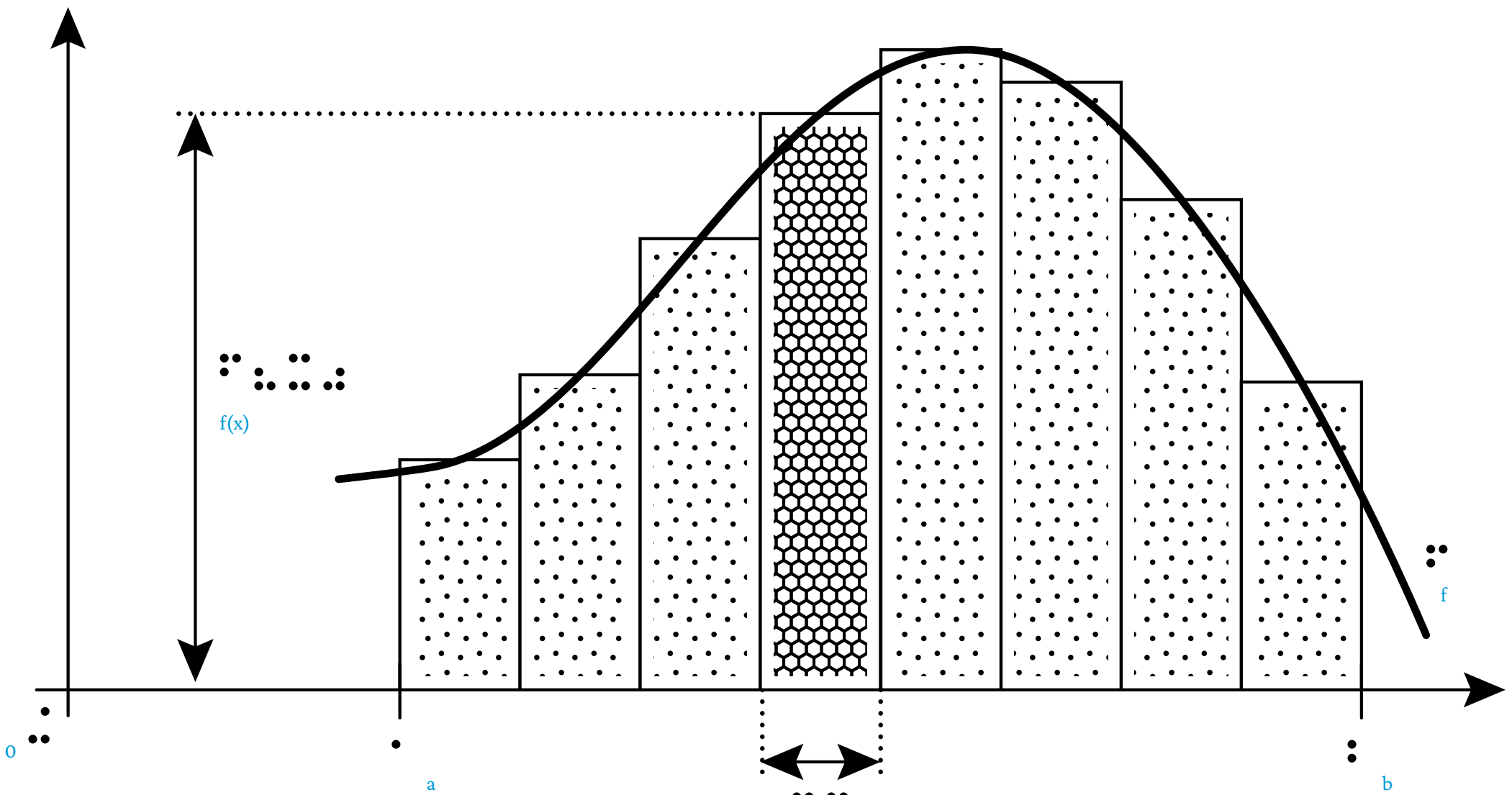
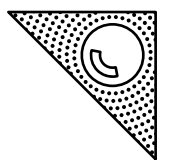
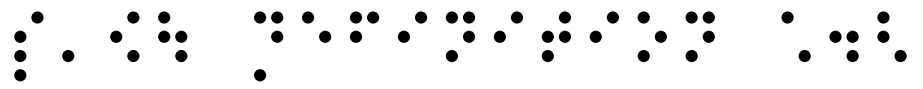
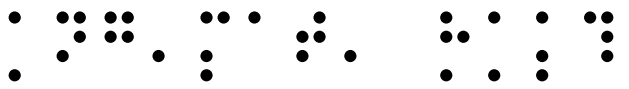
x_3

90

x_4

$dx = 30$





$=f(x) \cdot dx$

dx

f

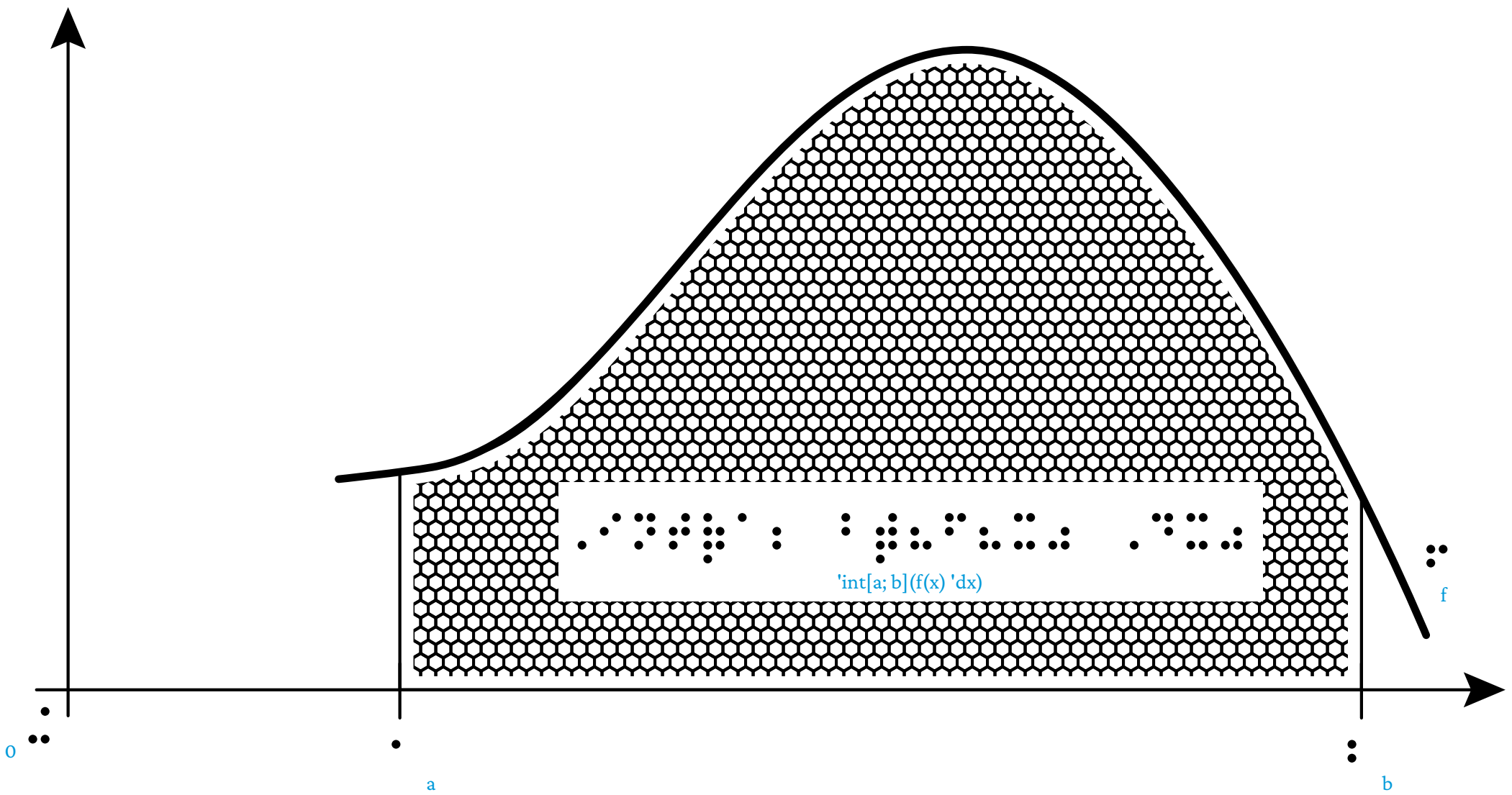
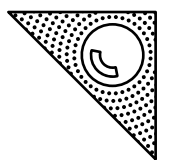
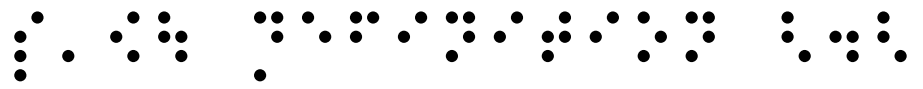
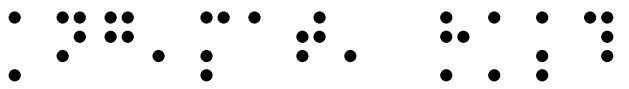
b

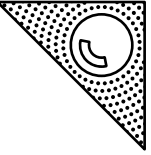
a

0

$f(x)$

dx

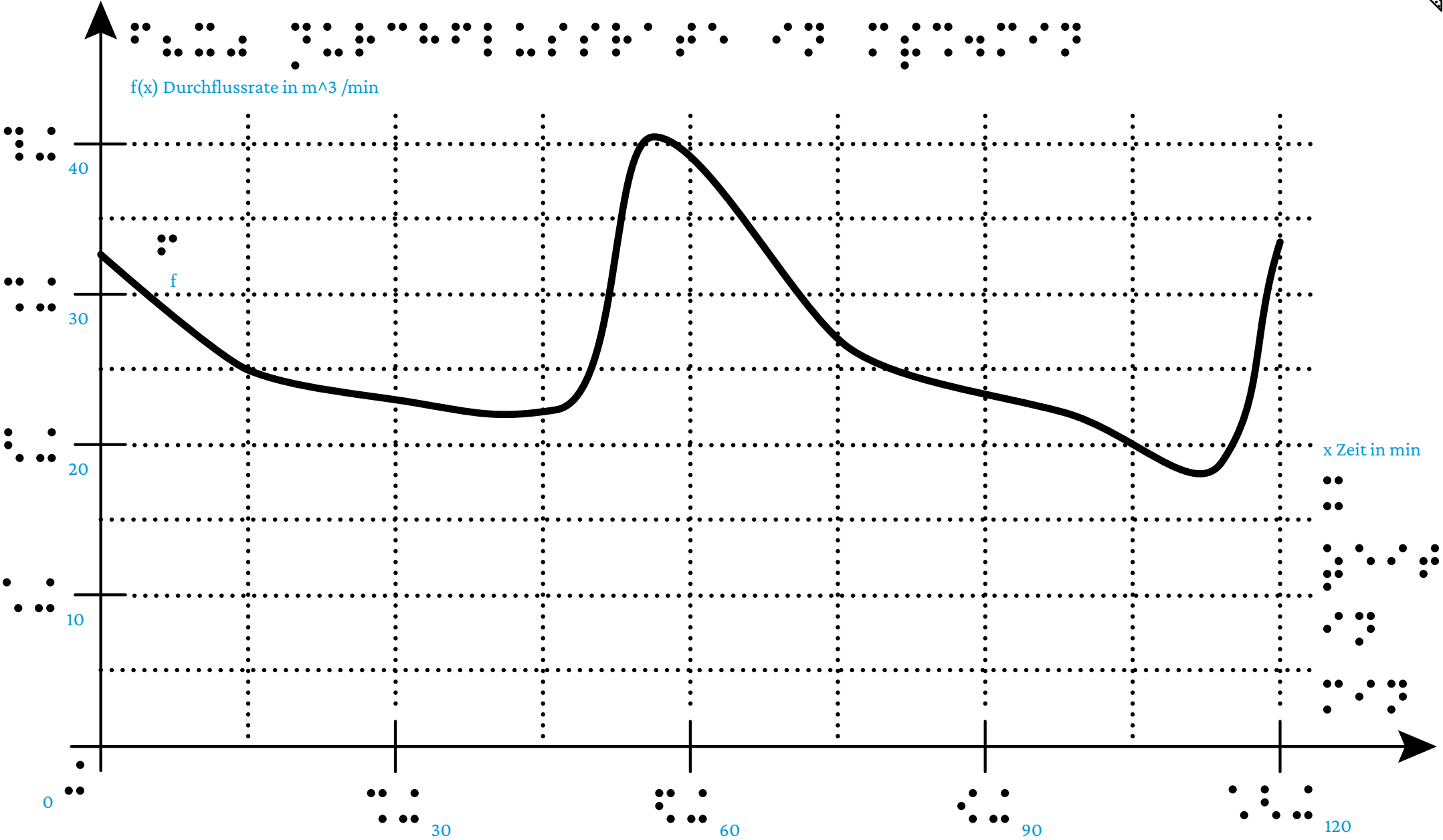




f(x) Durchflussrate in m³ /min

f

x Zeit in min



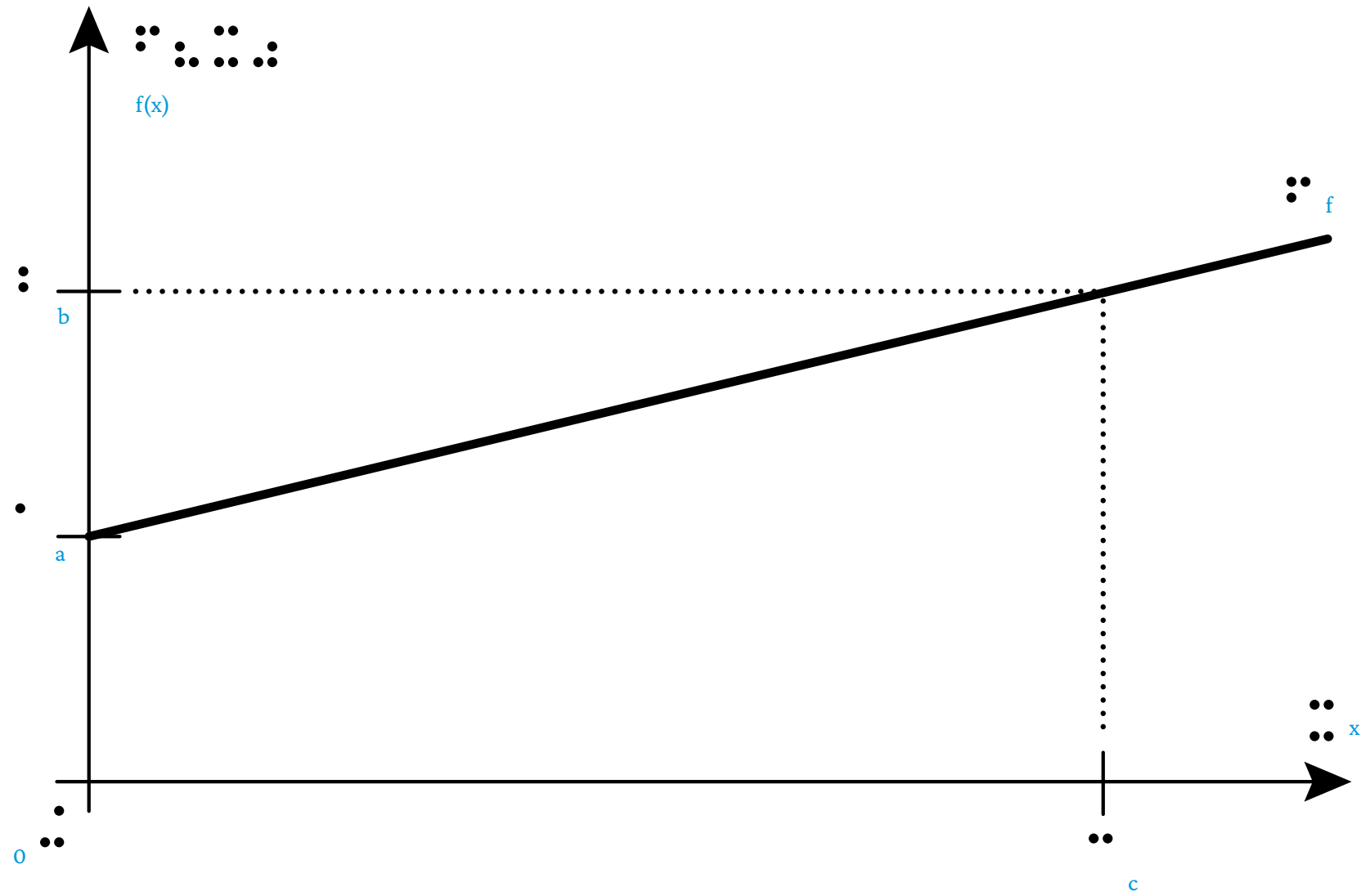
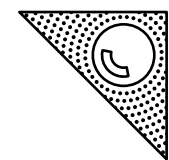
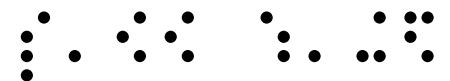
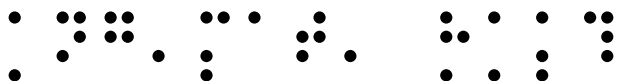
0

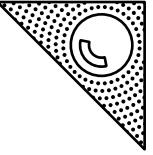
30

60

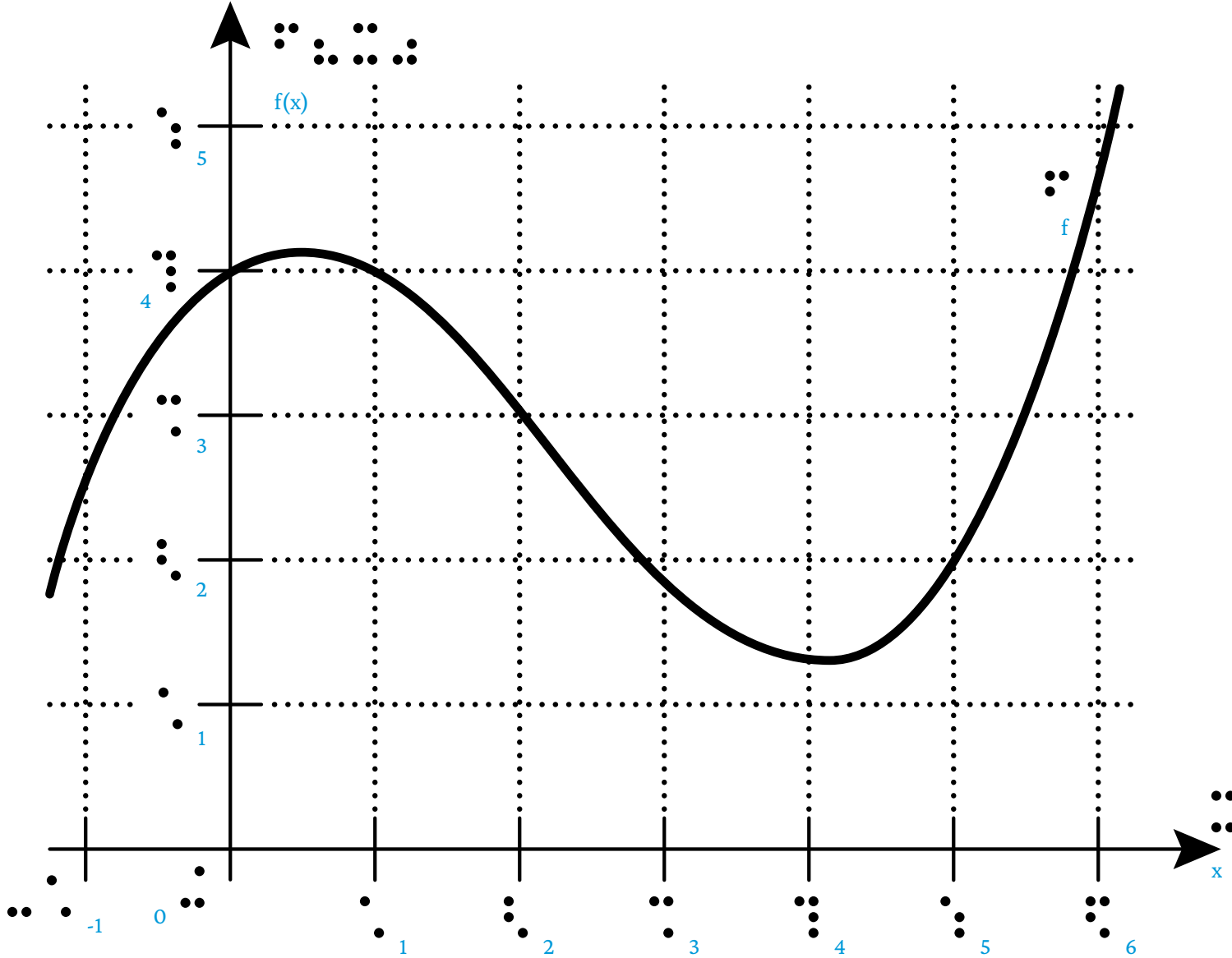
90

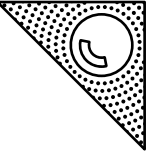
120



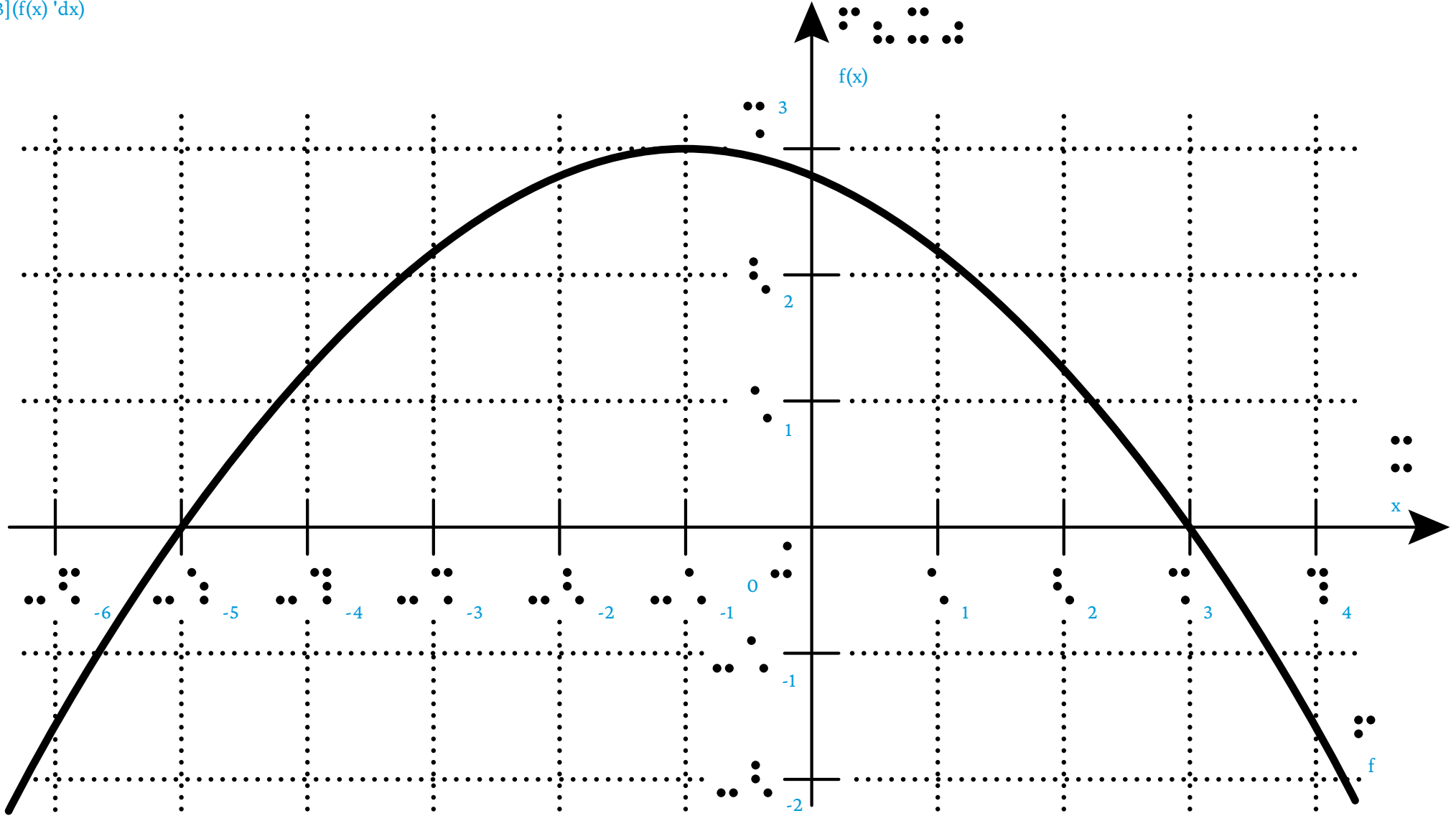


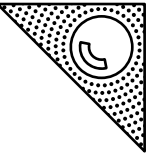
$\int_{0;5} (f(x) 'dx)$



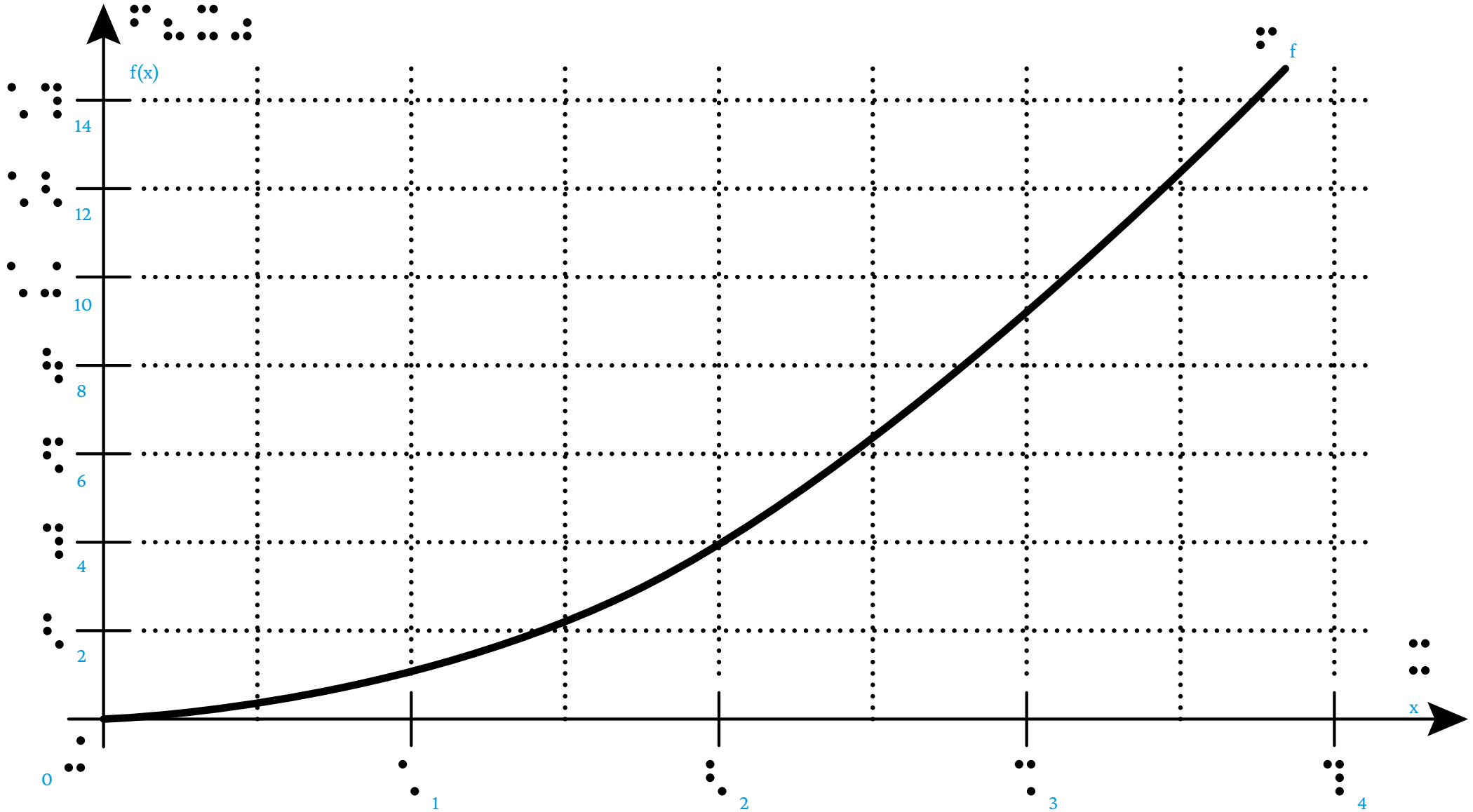


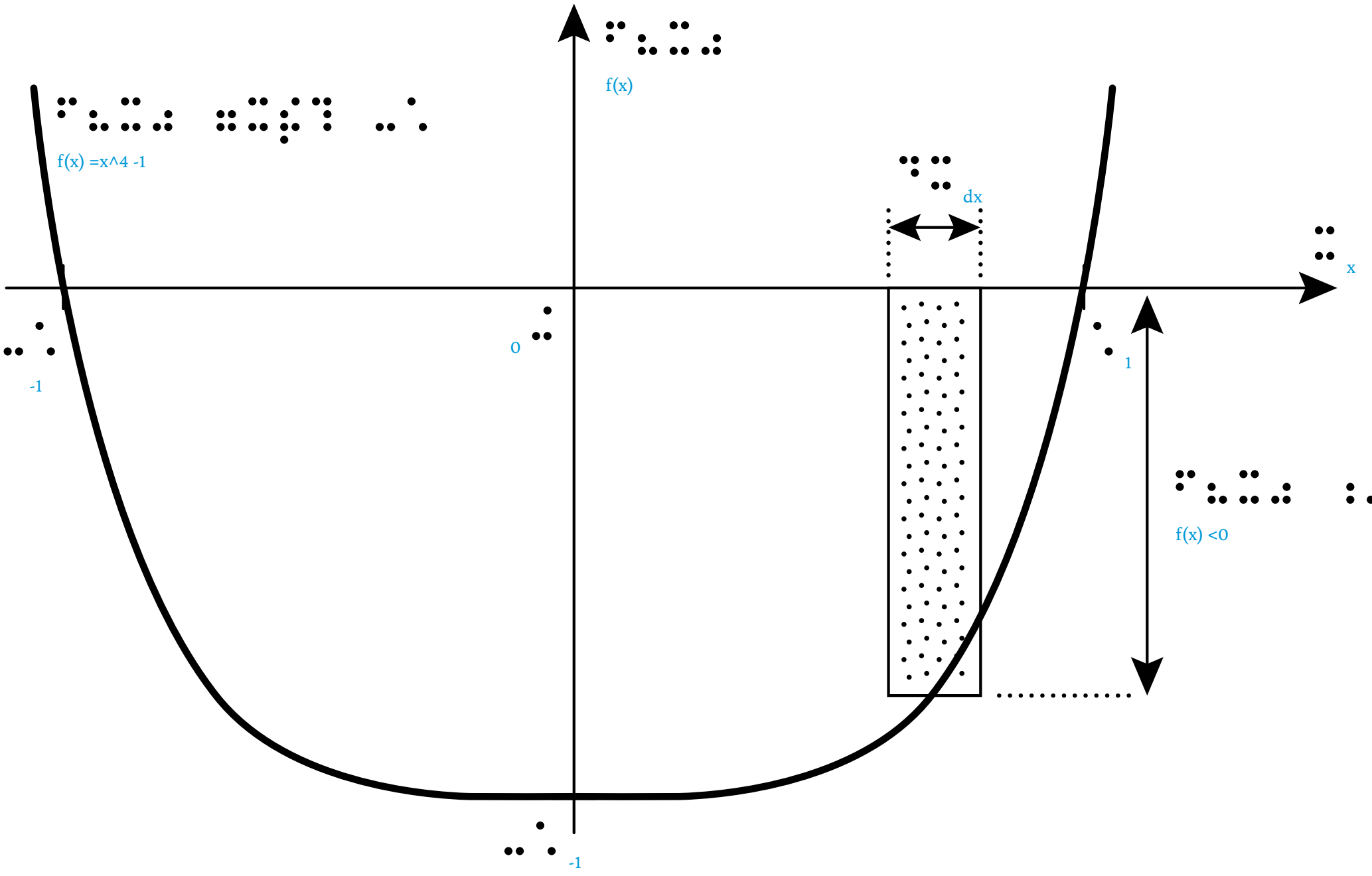
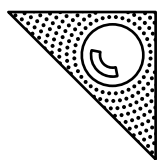
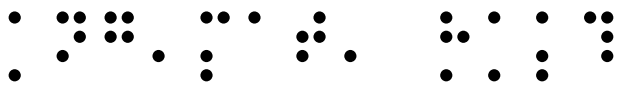
$\int_{-2; 3} (f(x))' dx$

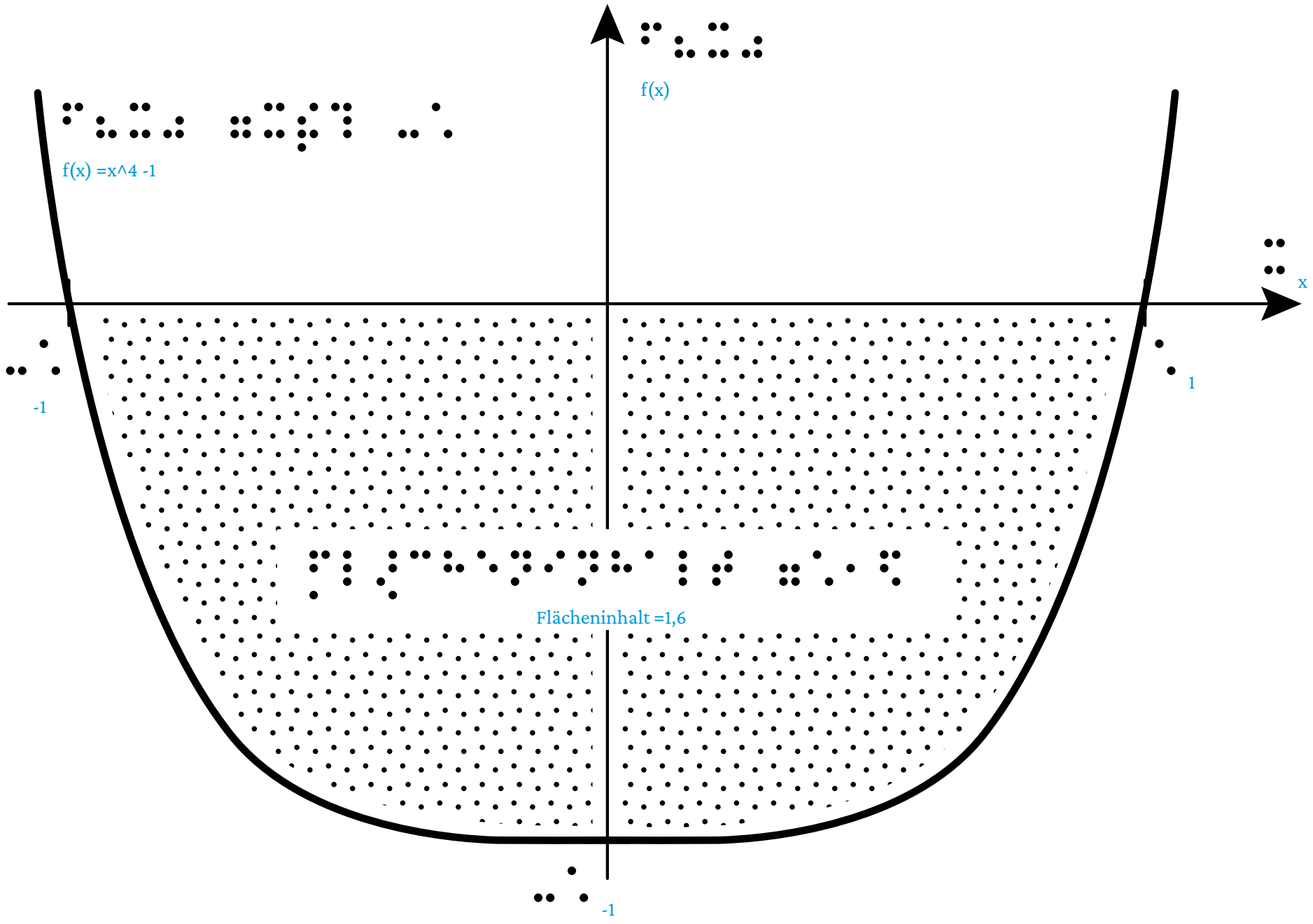
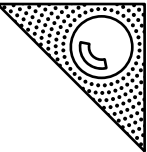
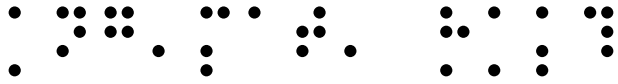


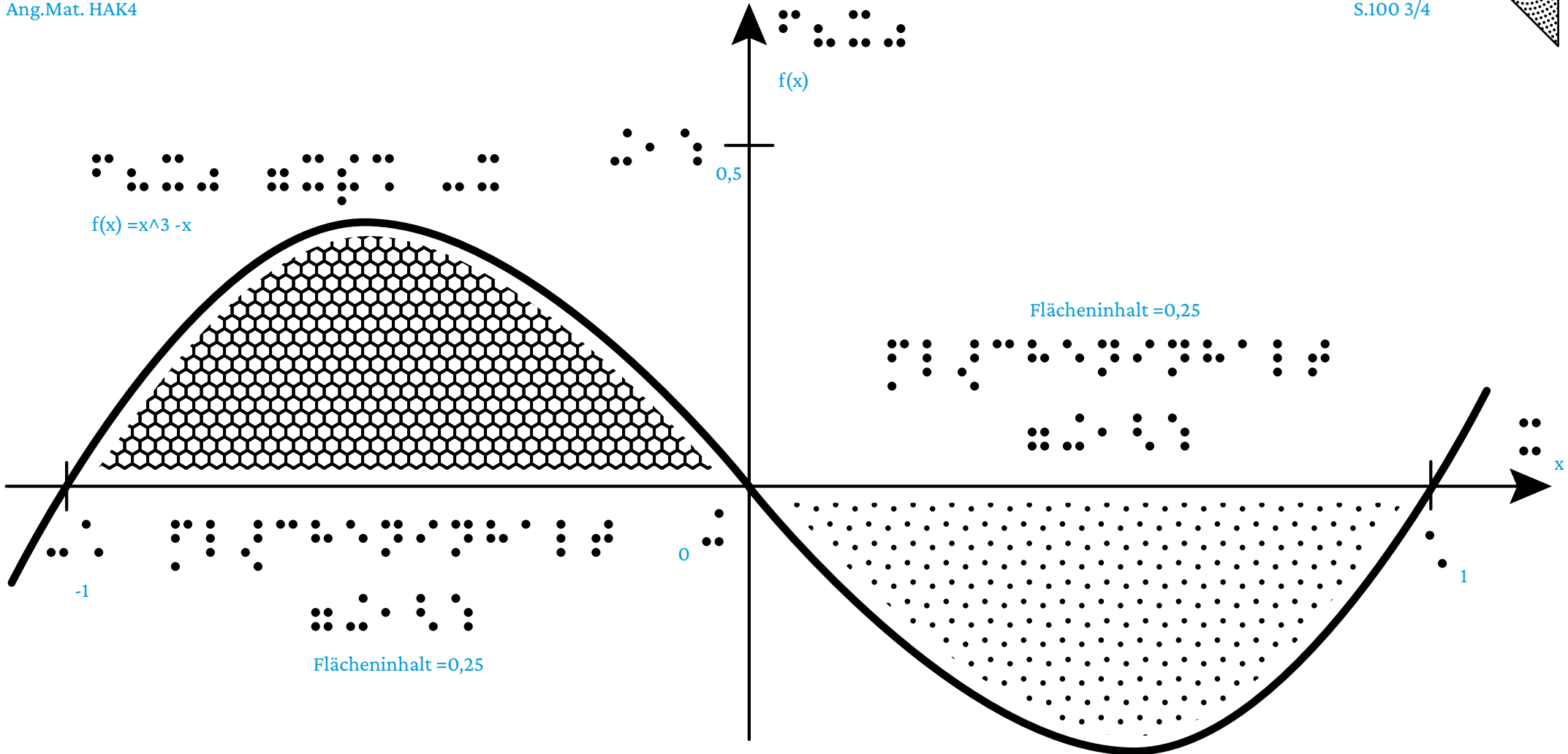
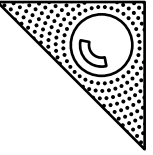


'int[1; 3](f(x) 'dx)



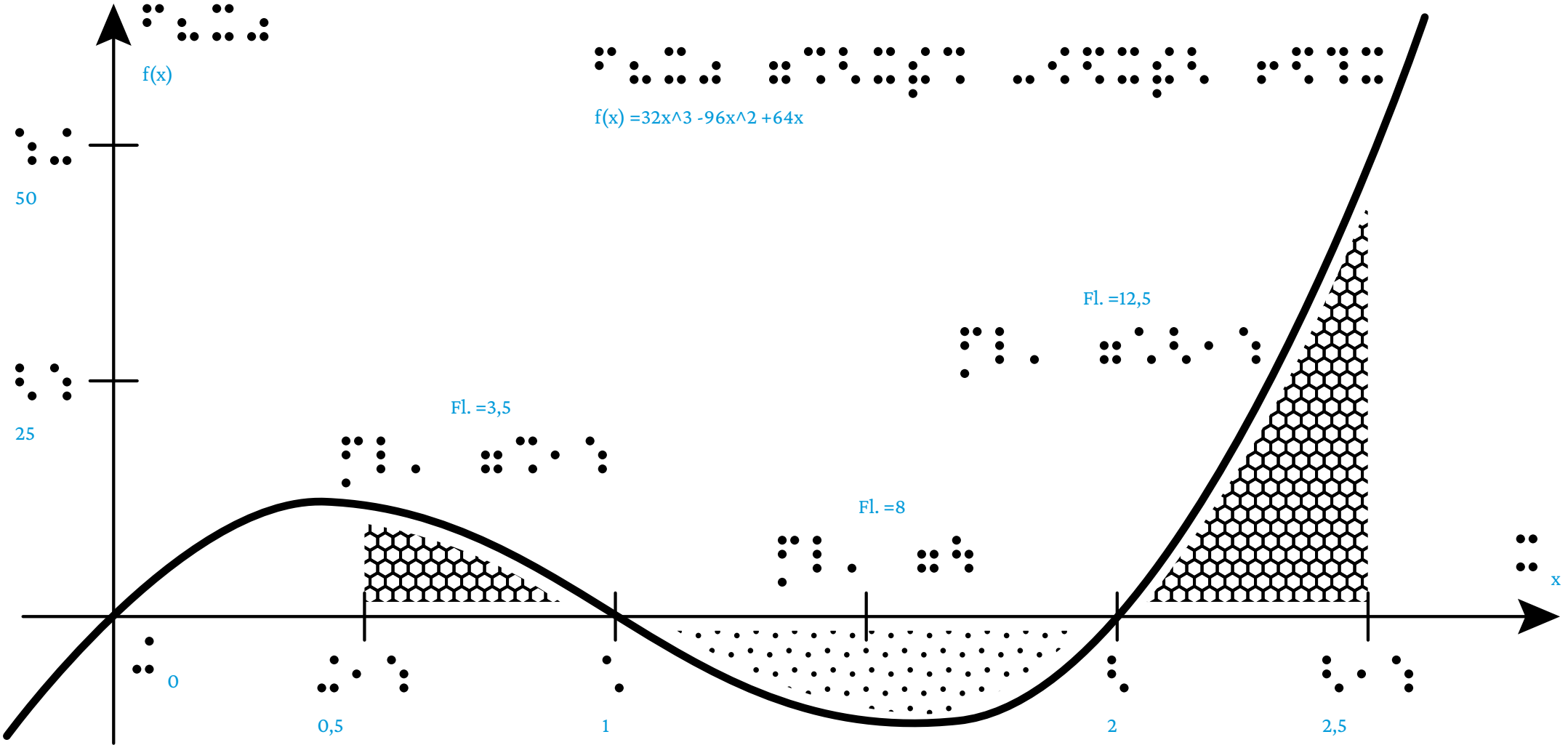
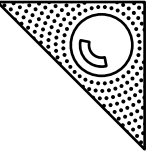






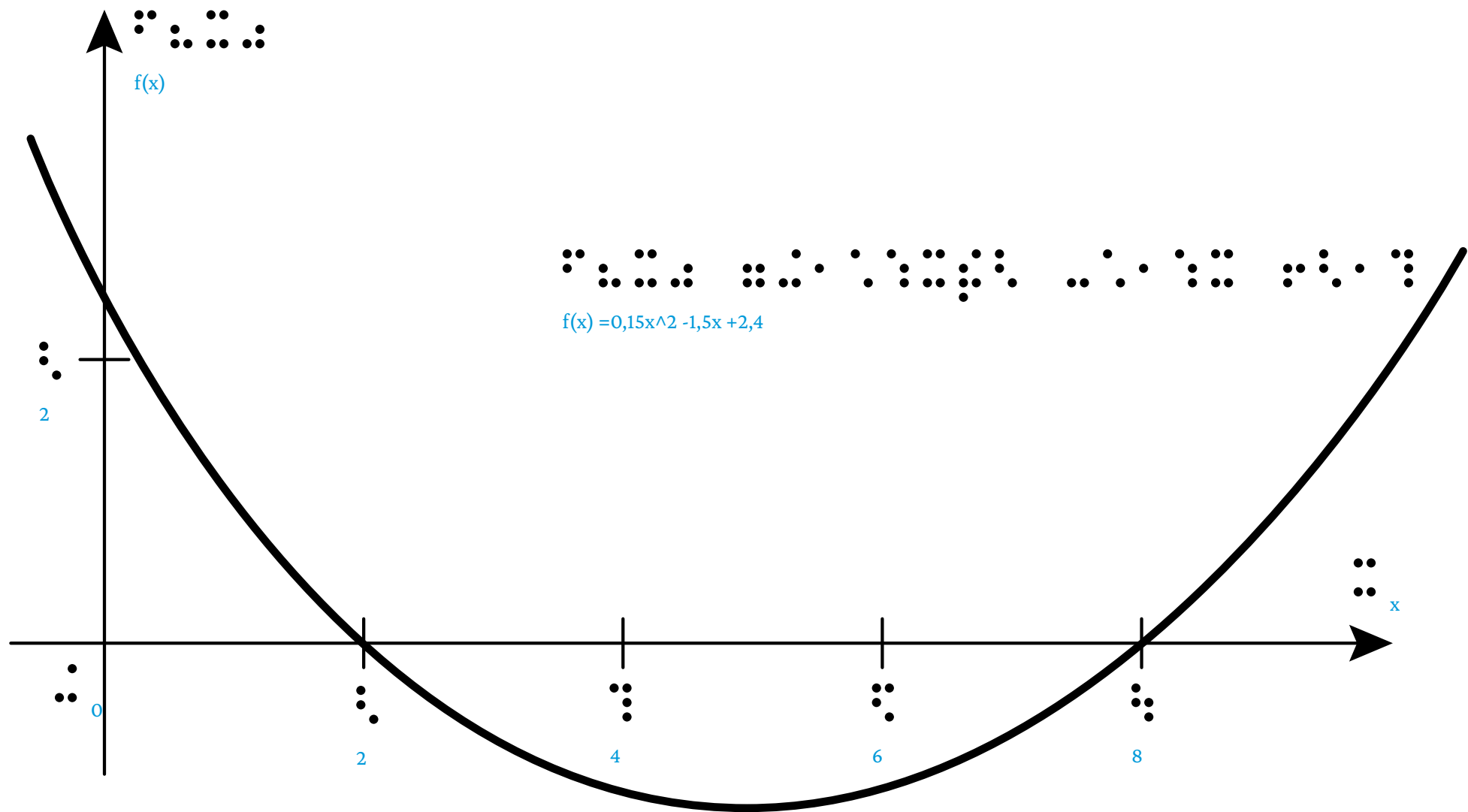
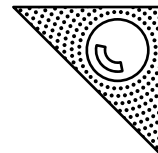
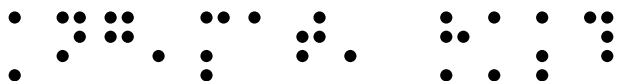
$\int_{-1;1} (f(x) 'dx) = 0,25 - 0,25 = 0$

Braille representation of the integral equation: $\int_{-1;1} (f(x) 'dx) = 0,25 - 0,25 = 0$



0,5 1 2 2,5

$\int_{0,5}^{2,5} (f(x) \cdot dx) = 3,5 - 8 + 12,5 = 8$



f(x)

2

0

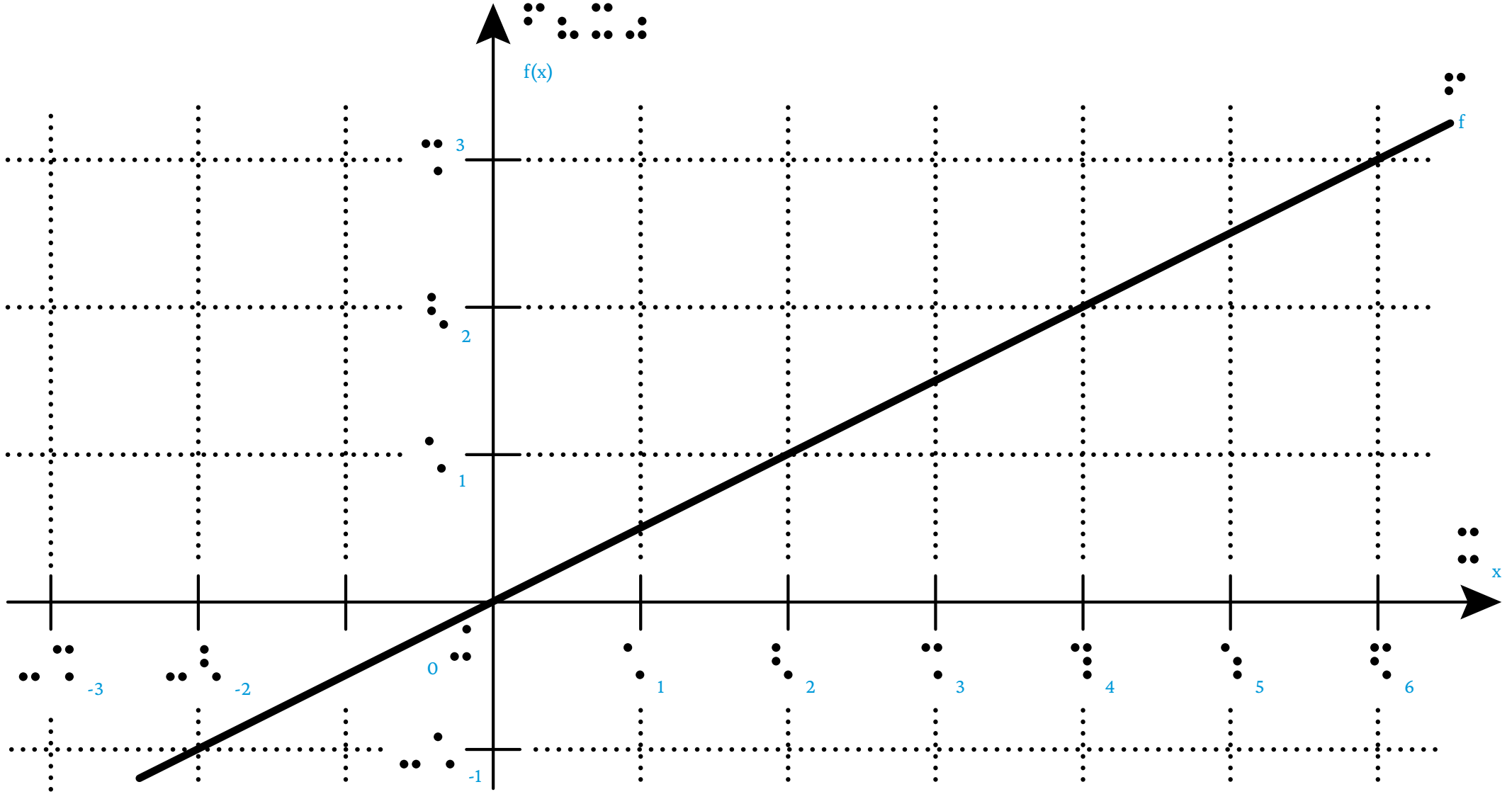
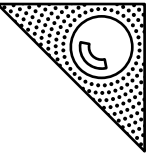
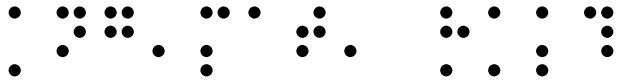
2

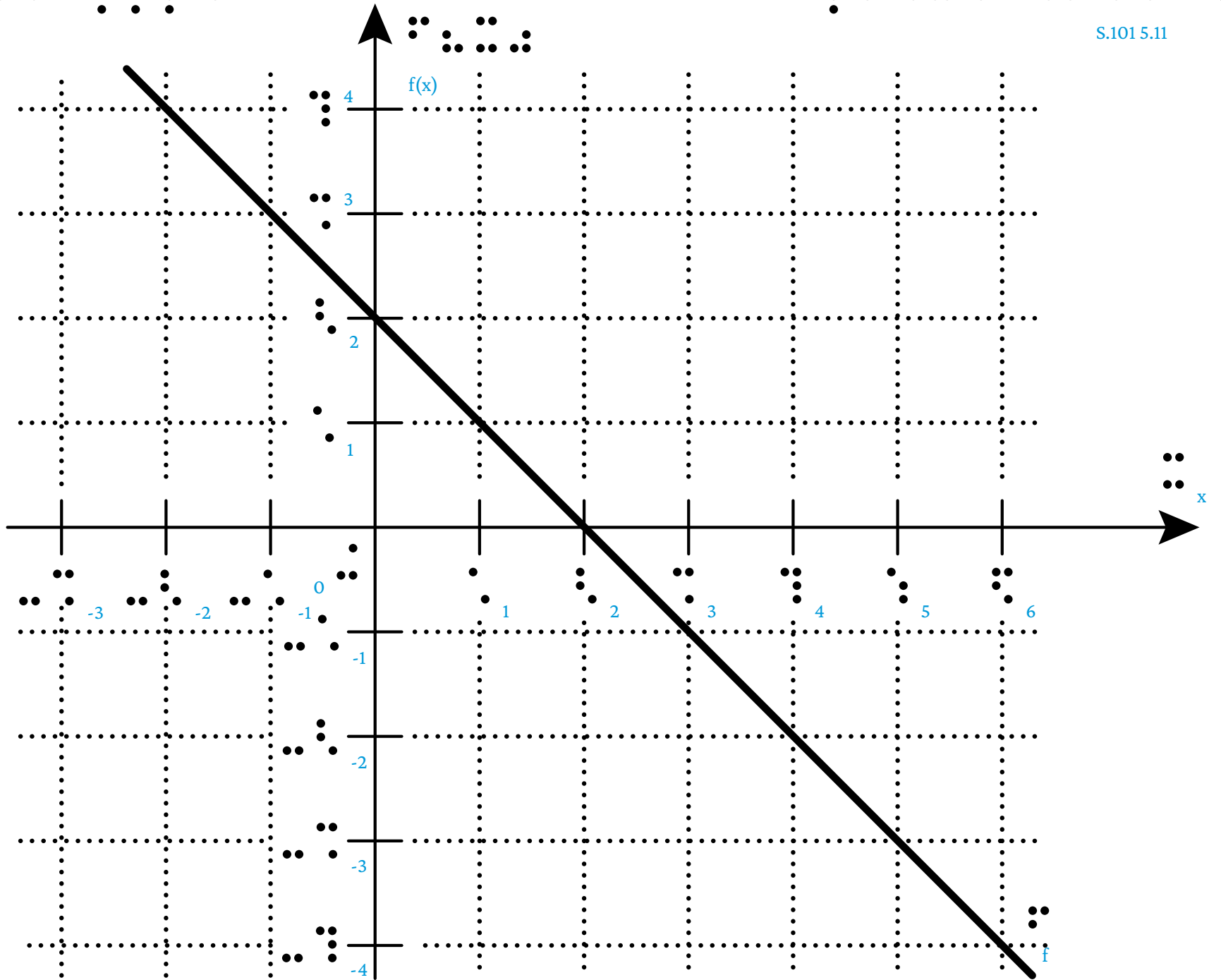
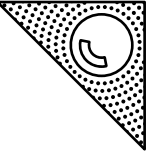
4

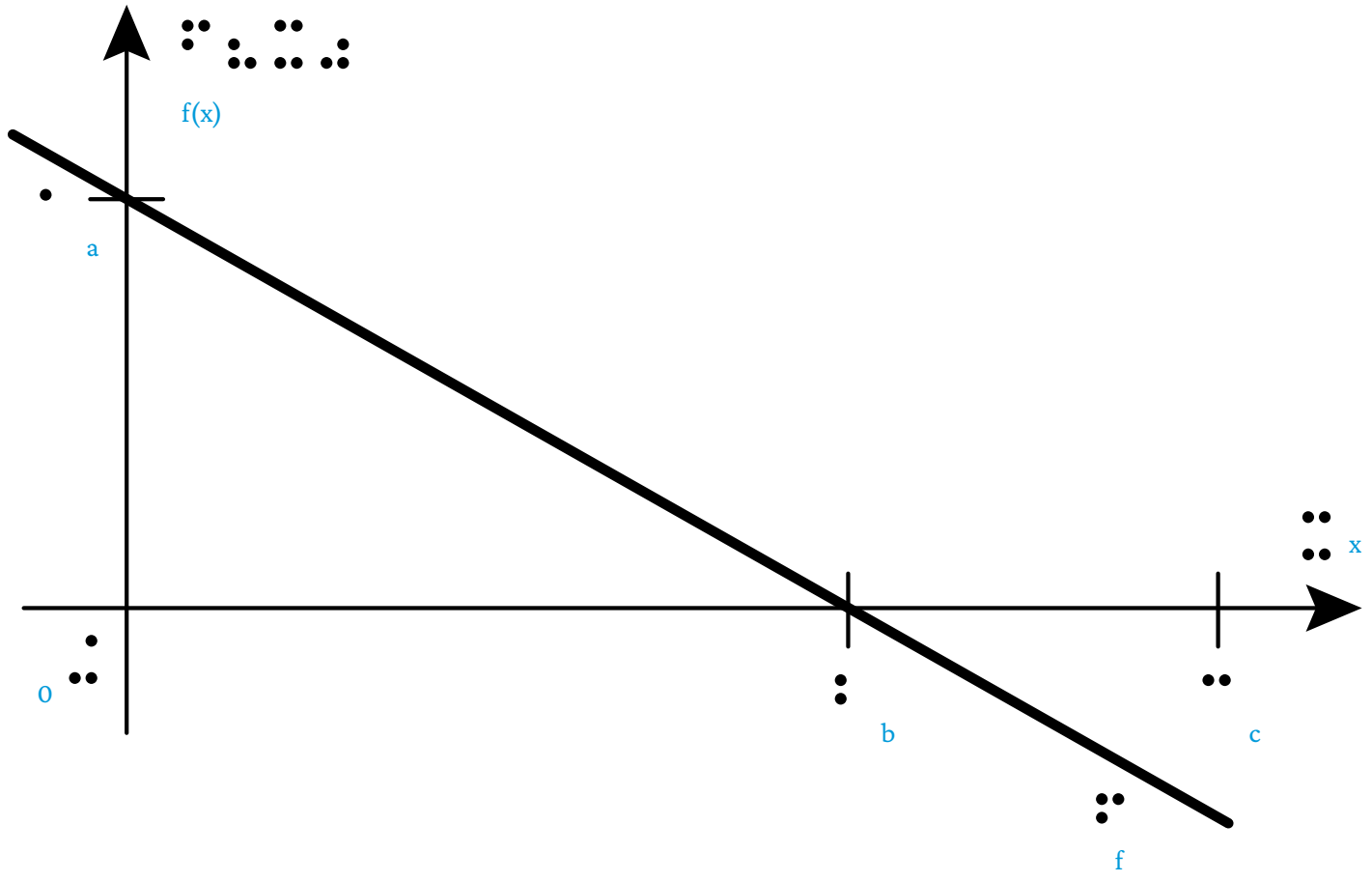
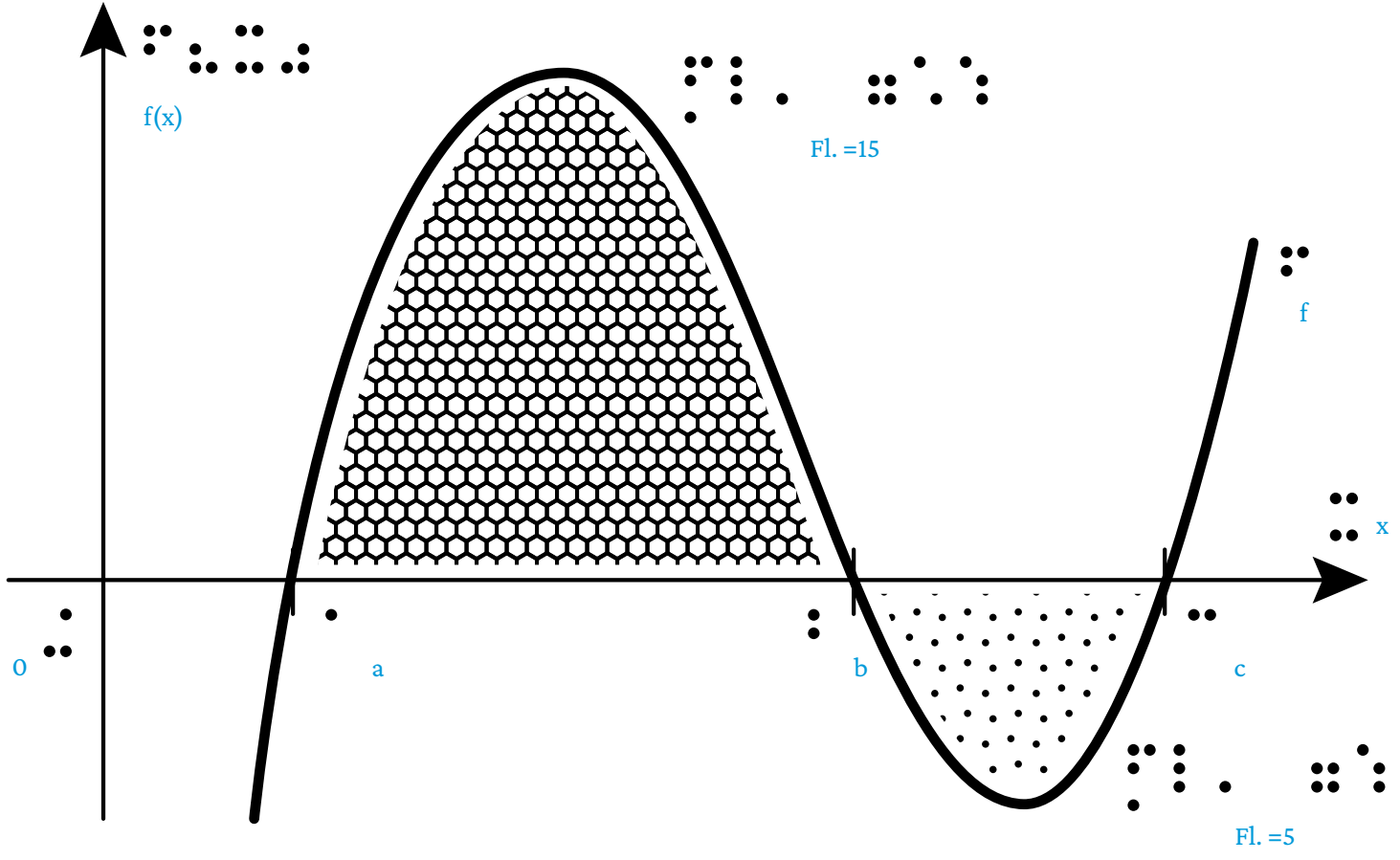
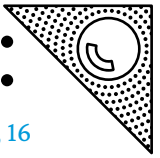
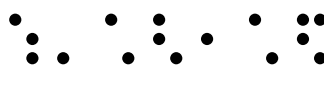
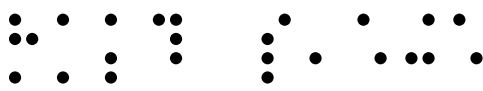
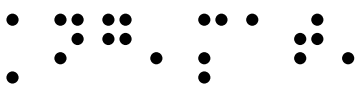
6

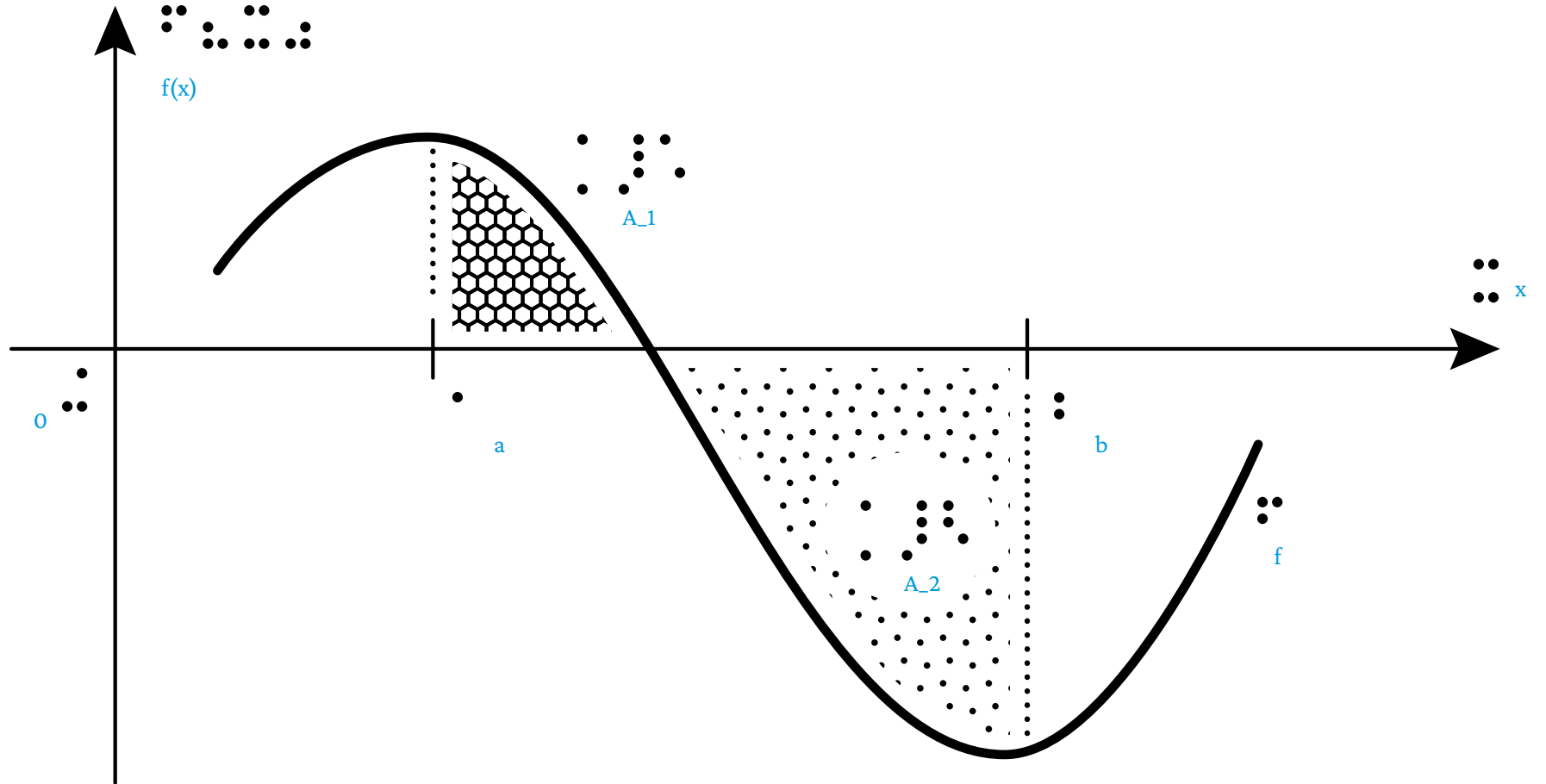
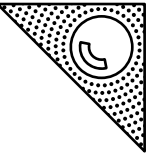
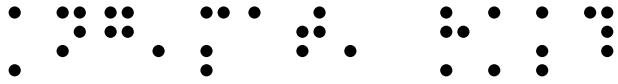
8

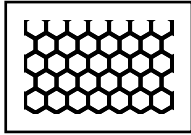
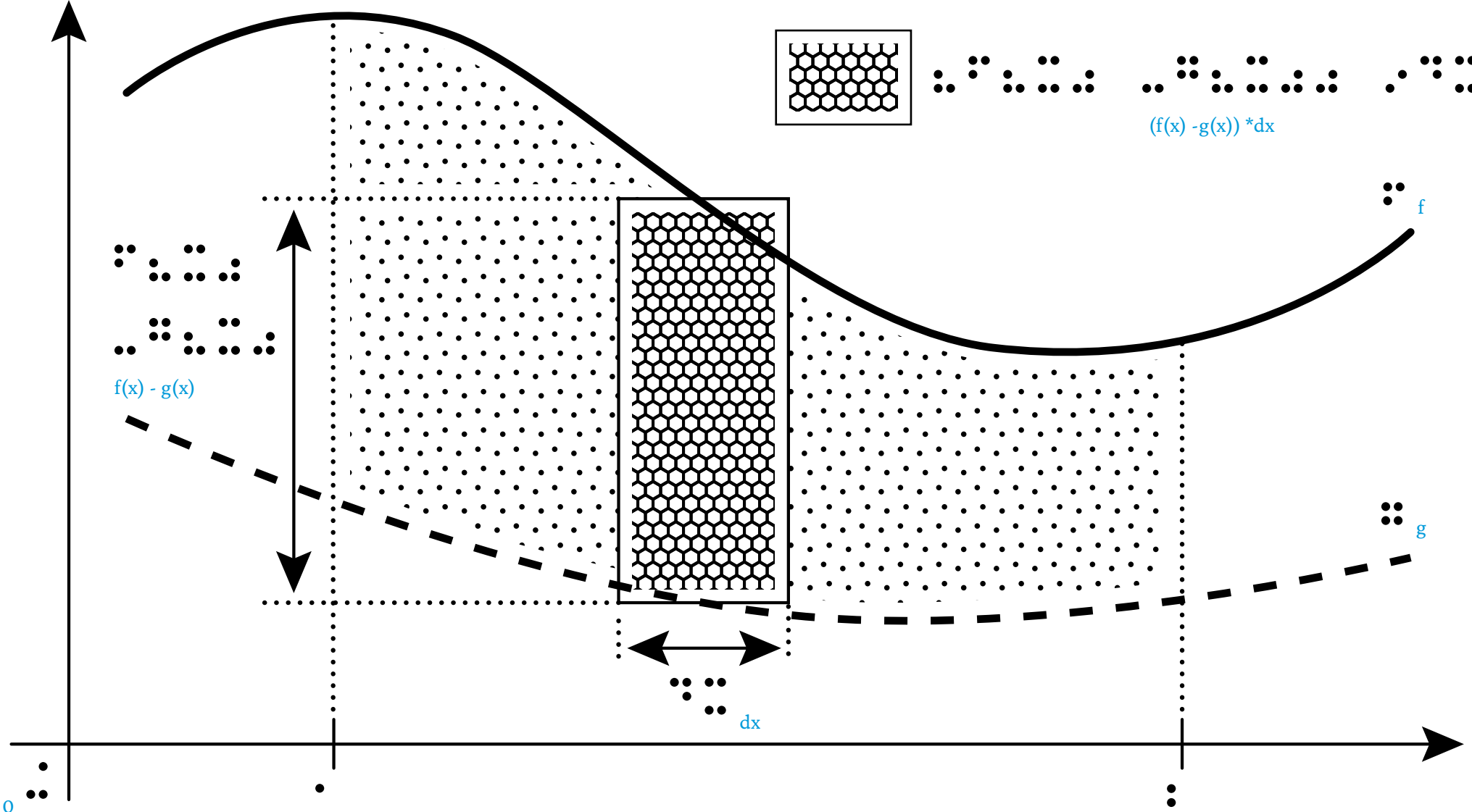
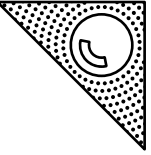
x







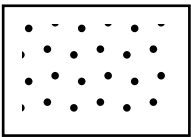




$(f(x) - g(x)) * dx$

$f(x) - g(x)$

dx



$\int_a^b (f(x) - g(x)) dx$

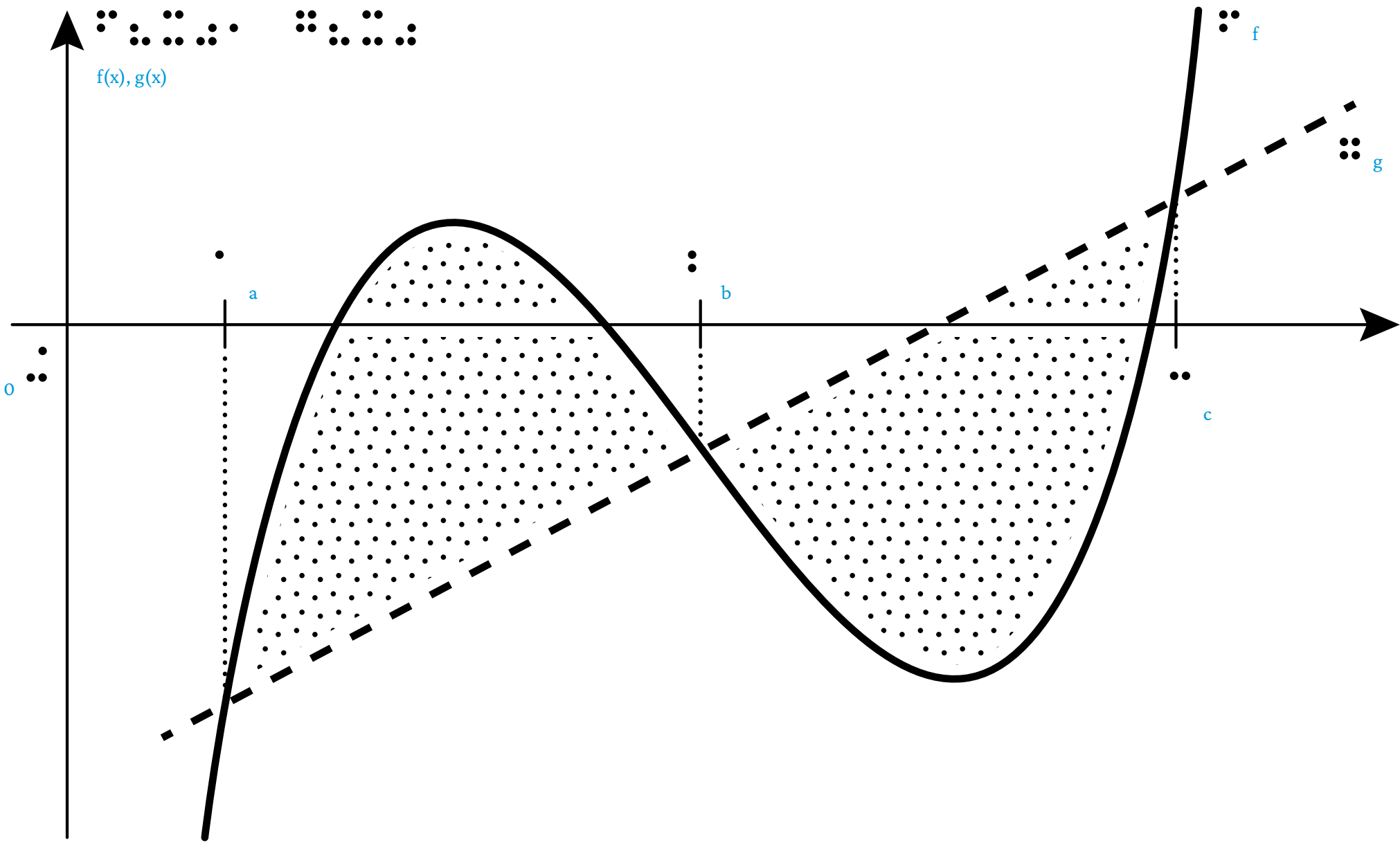
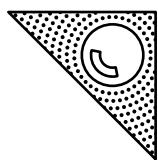
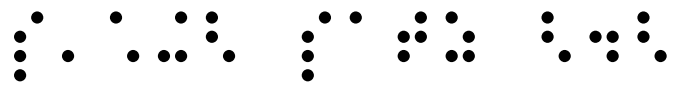
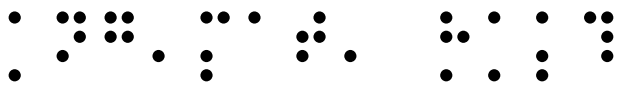
a

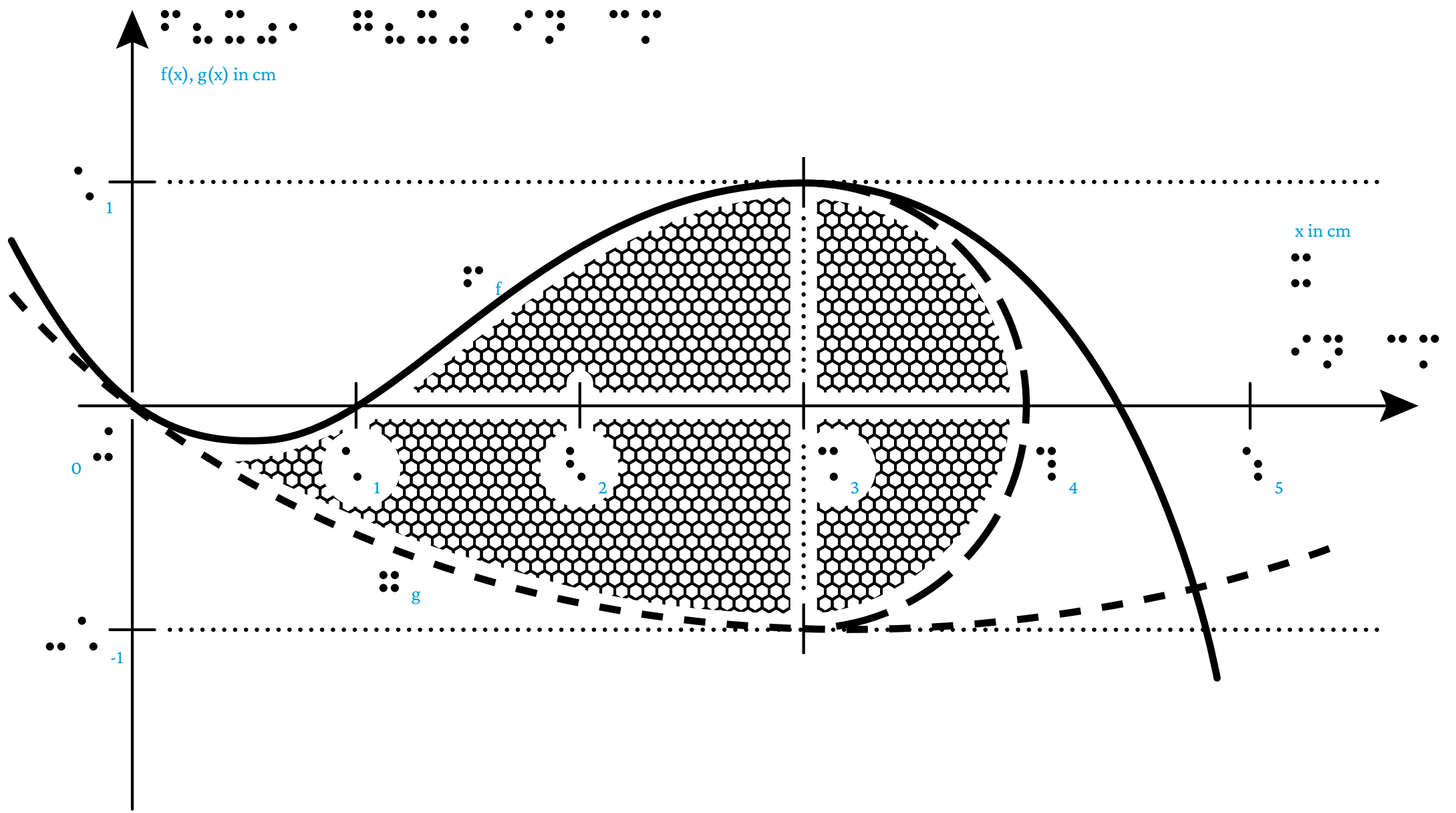
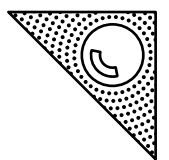
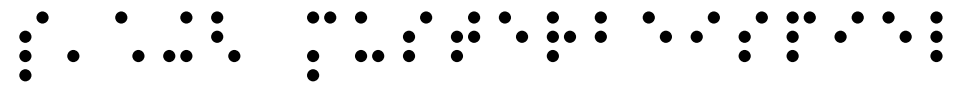
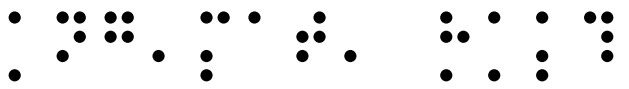
b

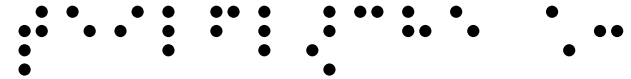
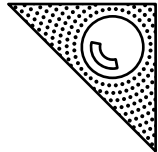
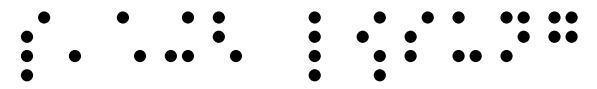
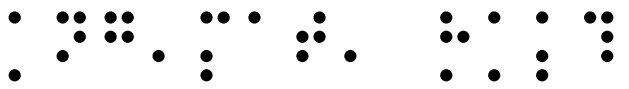
0

f

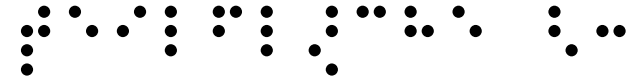
g



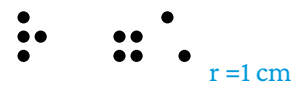




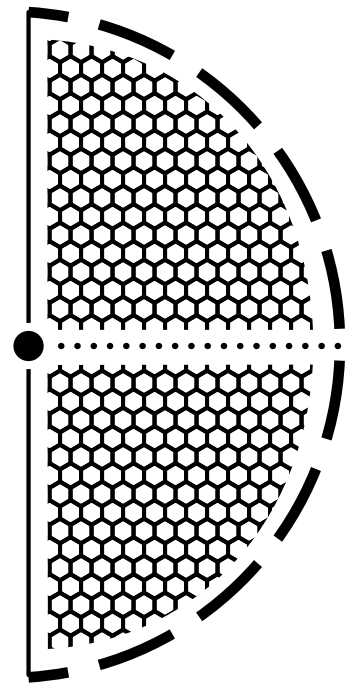
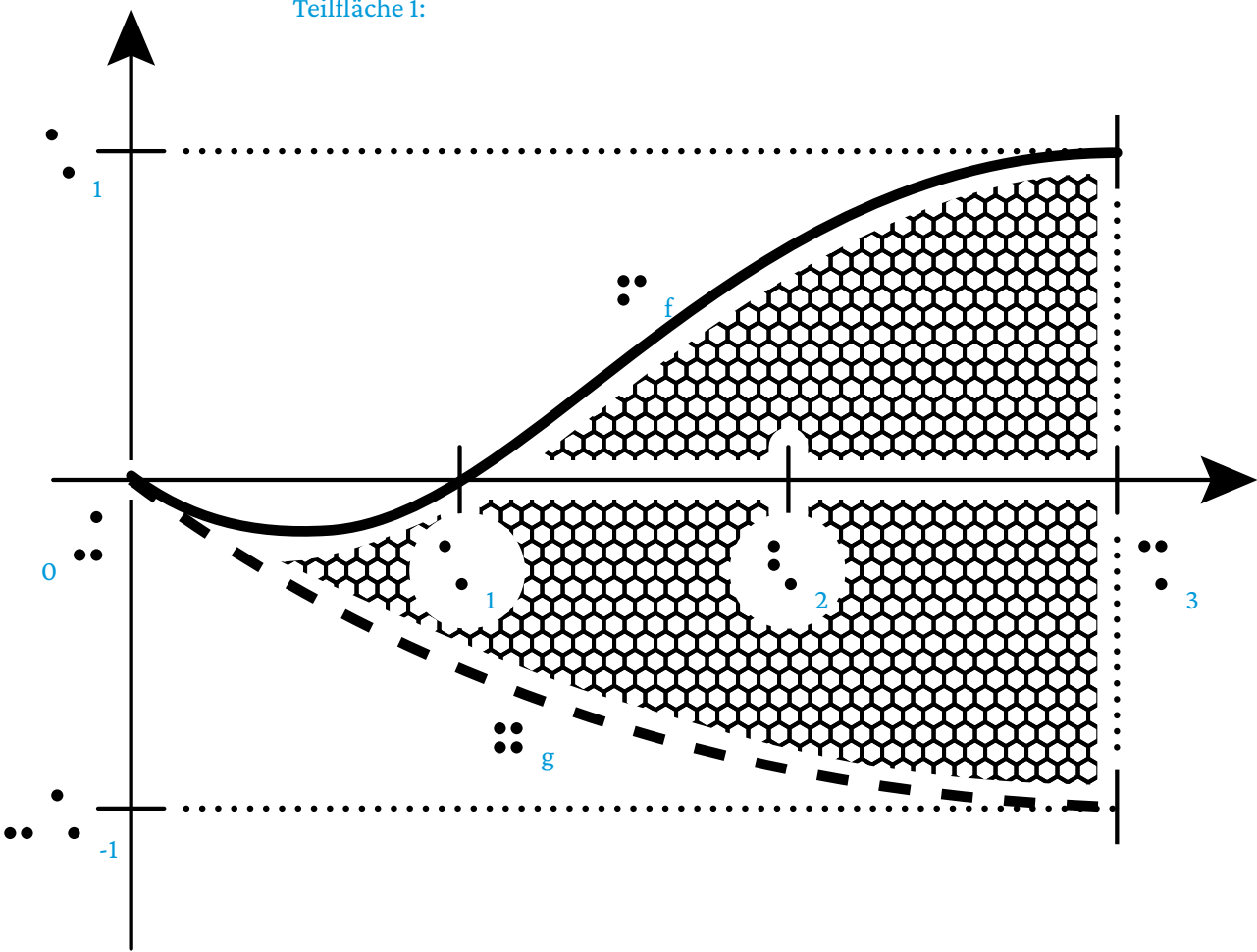
Teilfläche 1:

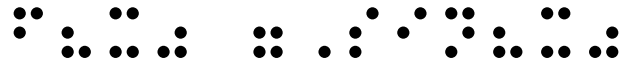
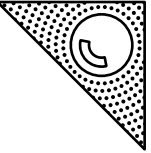
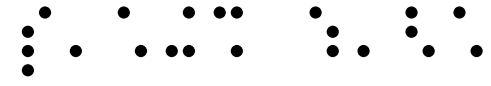
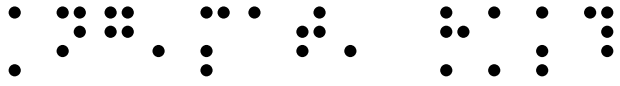


Teilfläche 2:



r = 1 cm





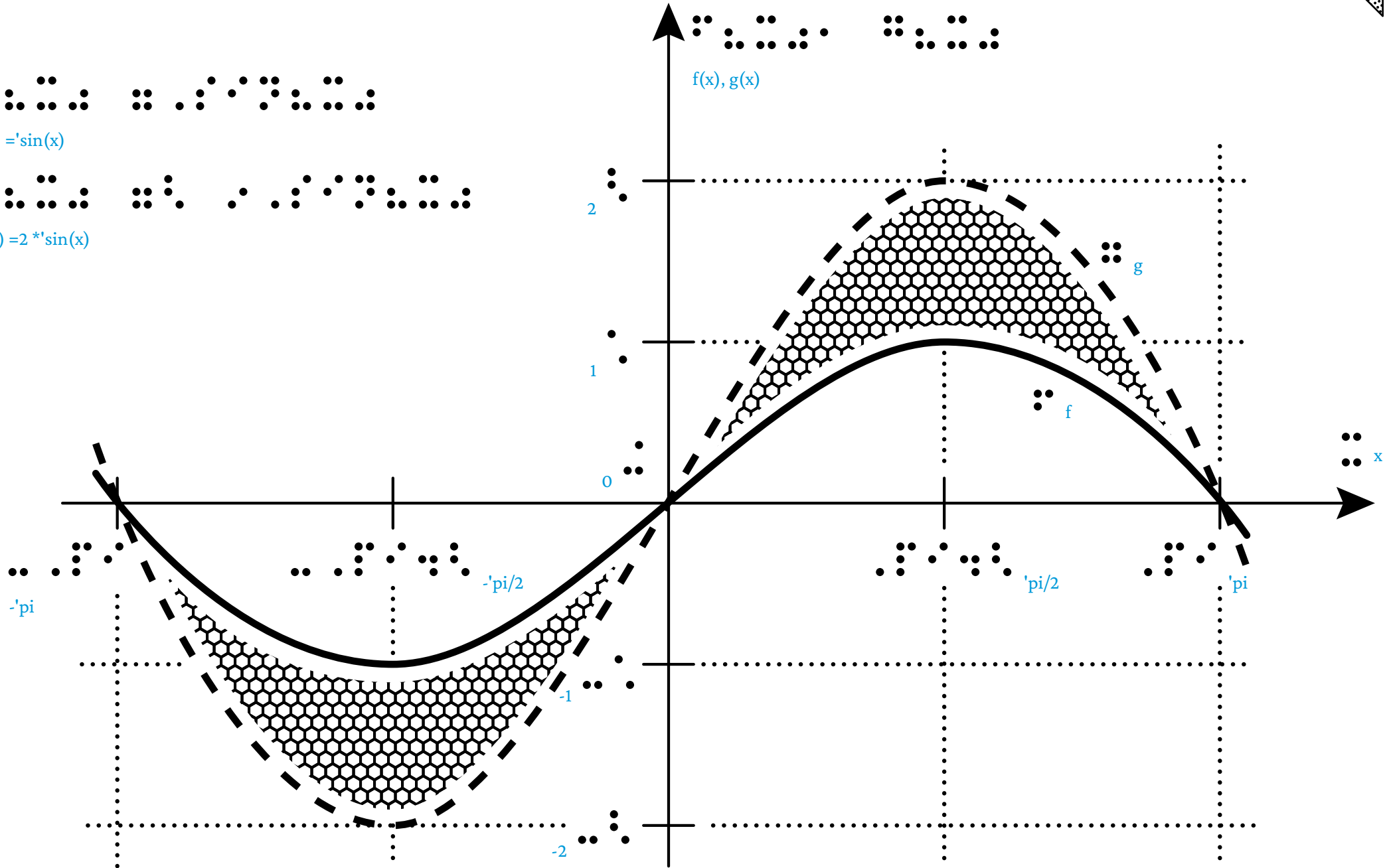
$f(x) = \sin(x)$

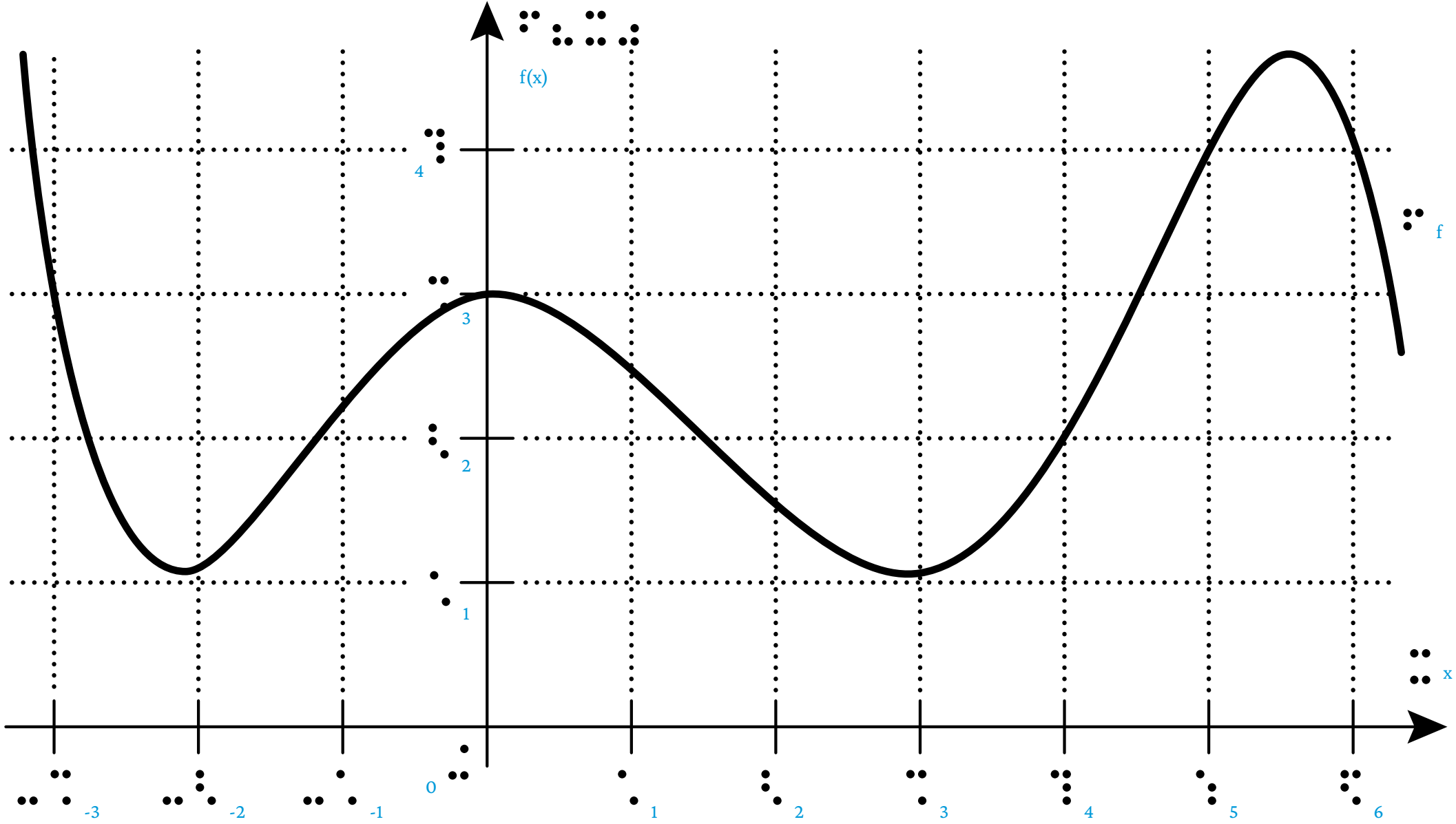
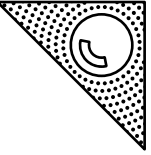
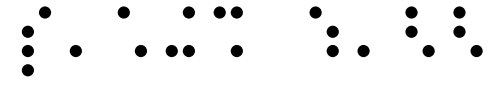
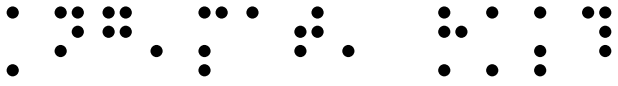


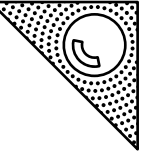
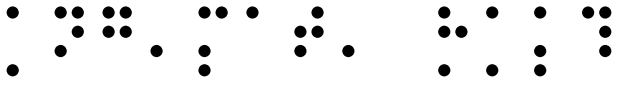
$g(x) = 2 * \sin(x)$



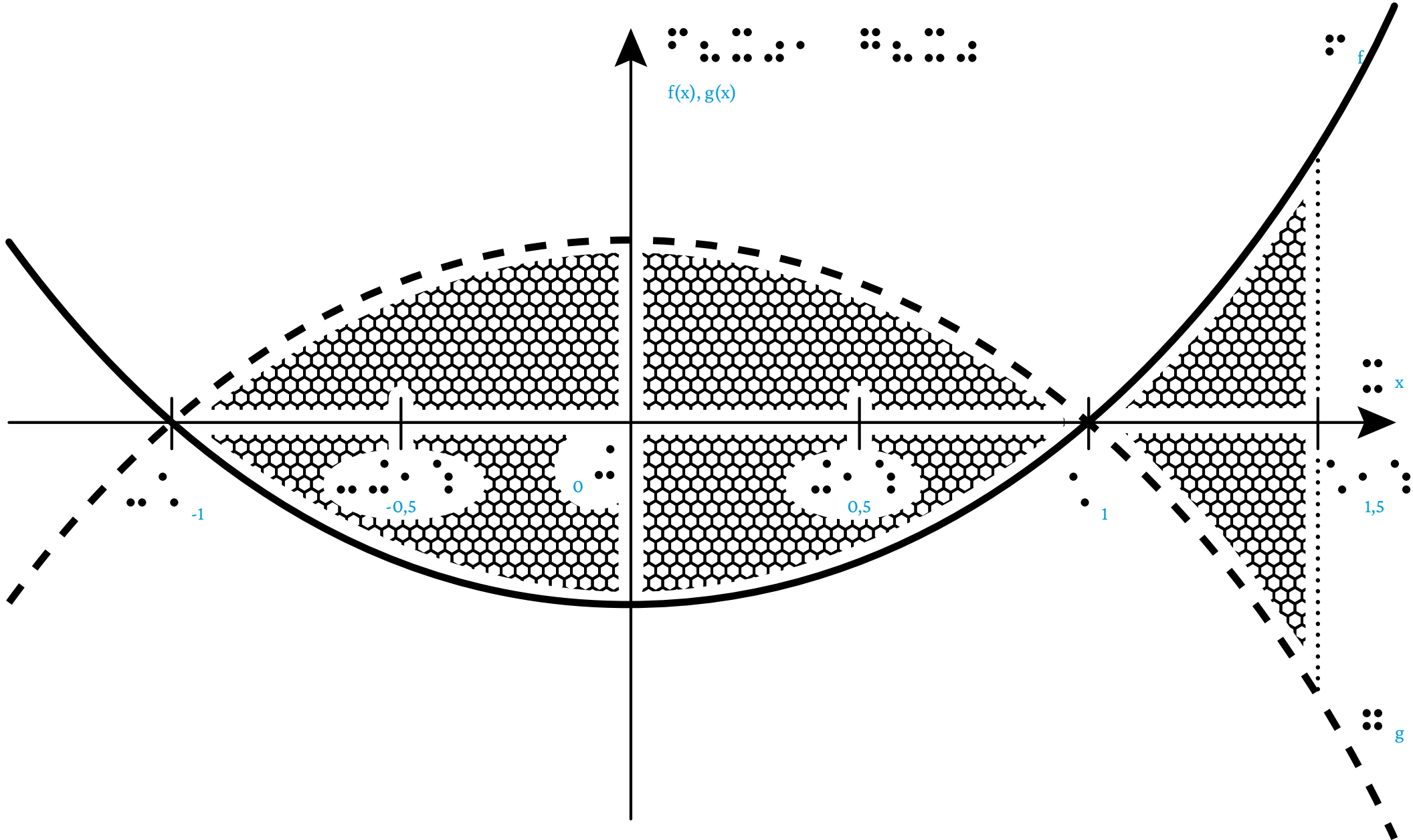
$f(x), g(x)$







$f(x), g(x)$



x

$1,5$

g

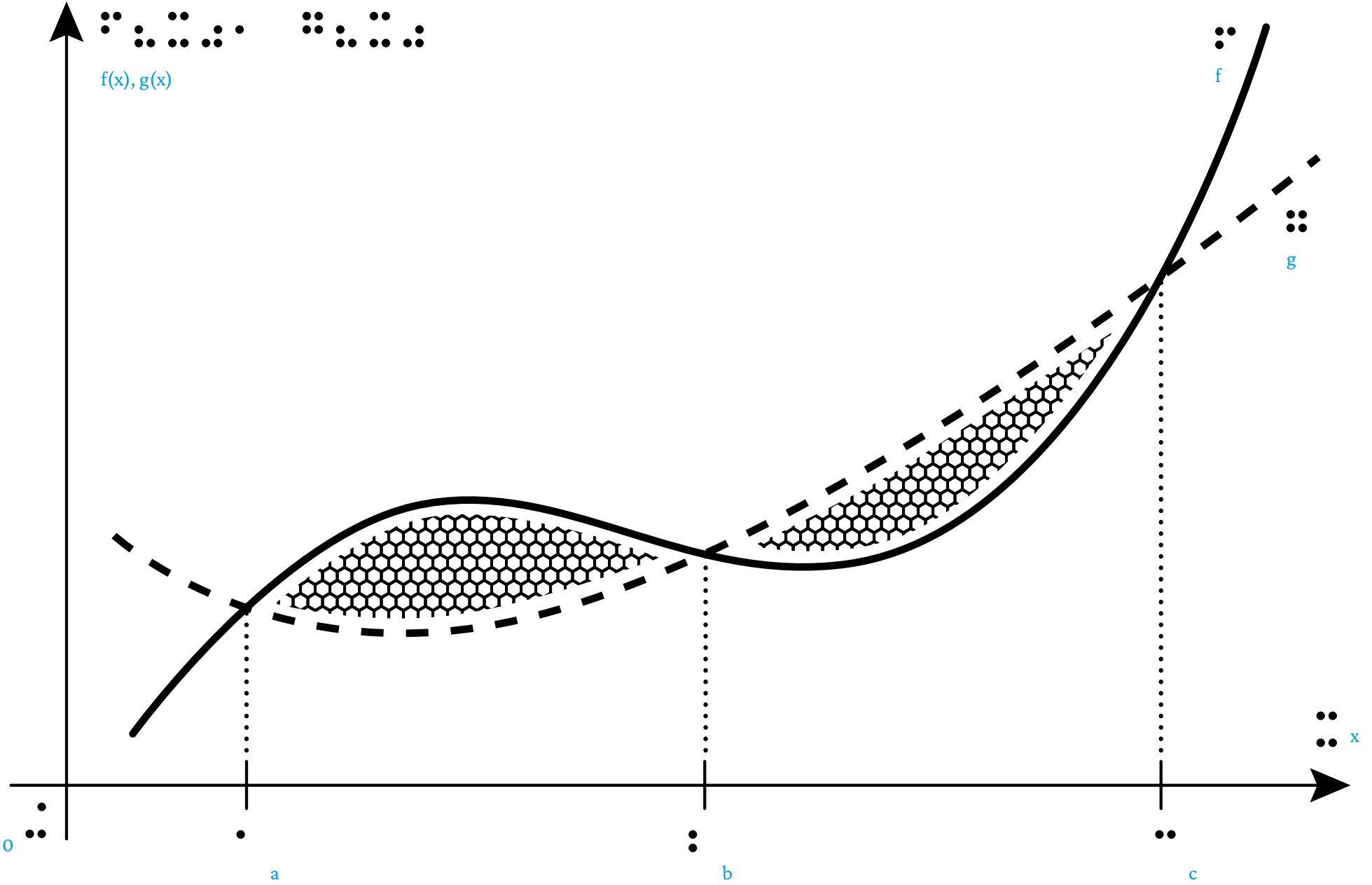
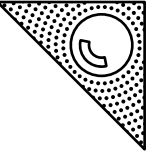
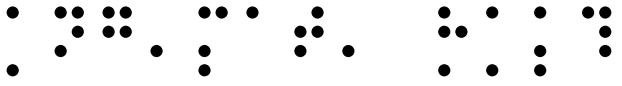
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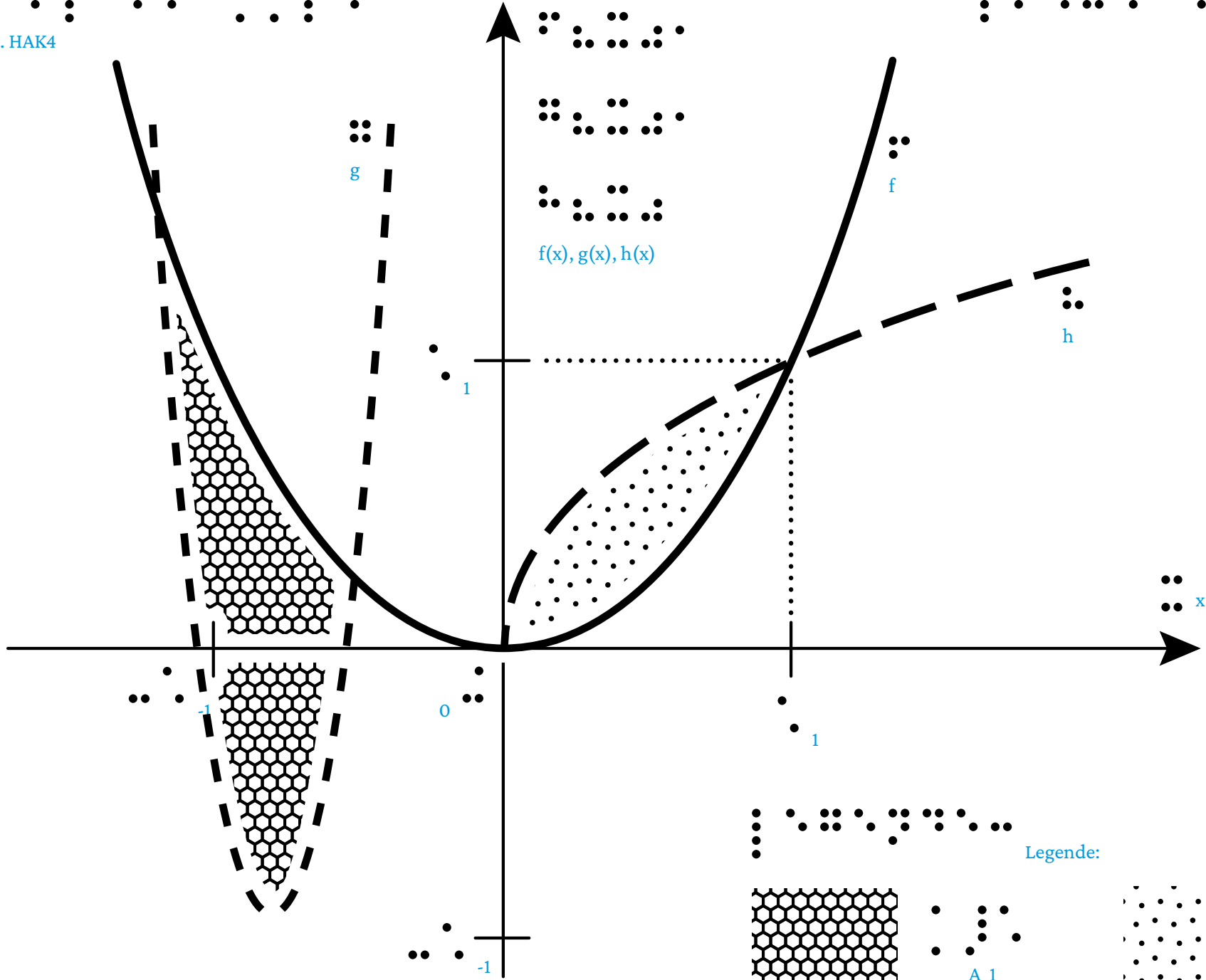
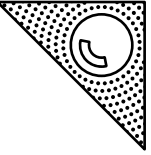
$-0,5$

0

$0,5$

1

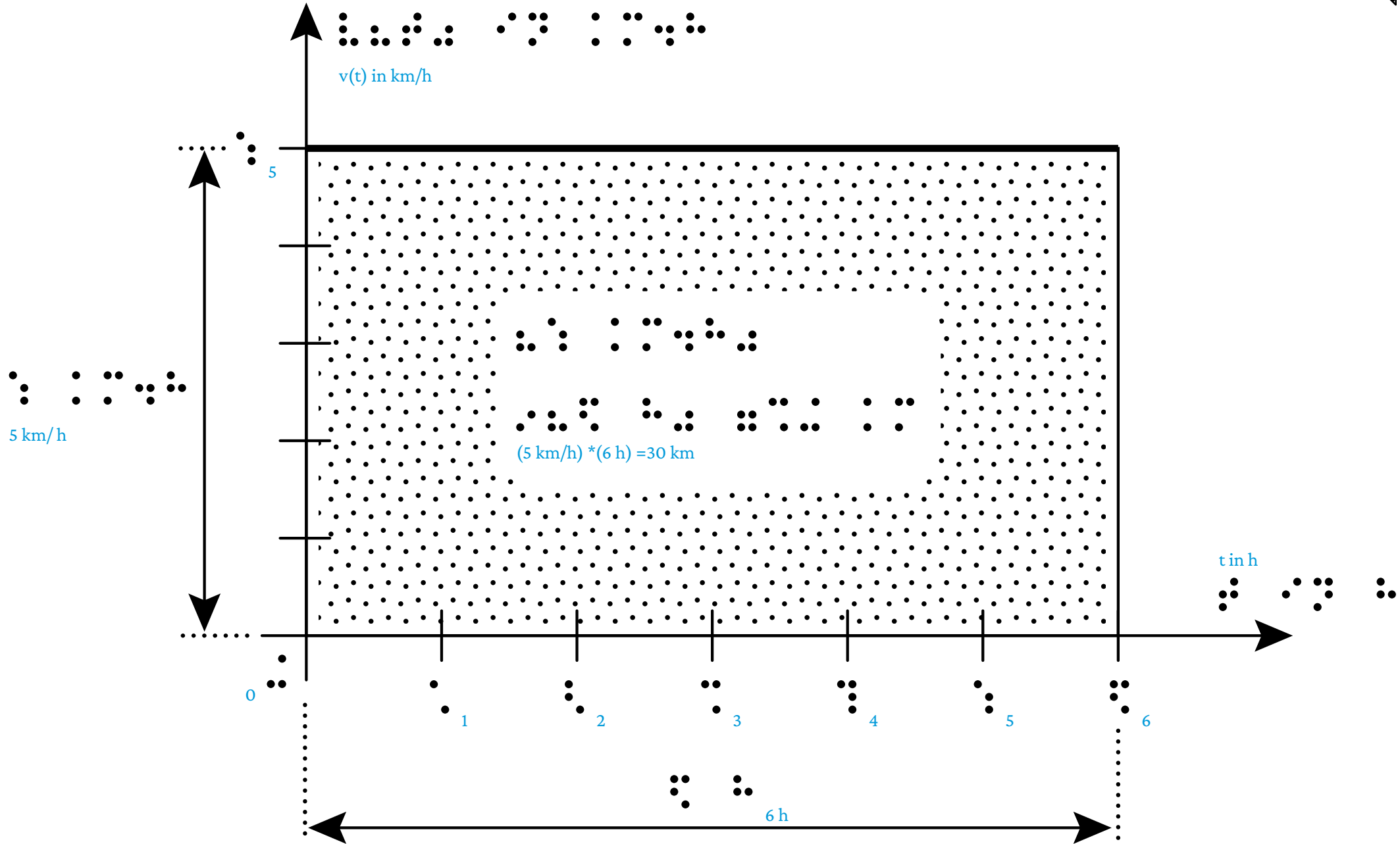
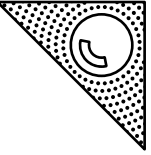


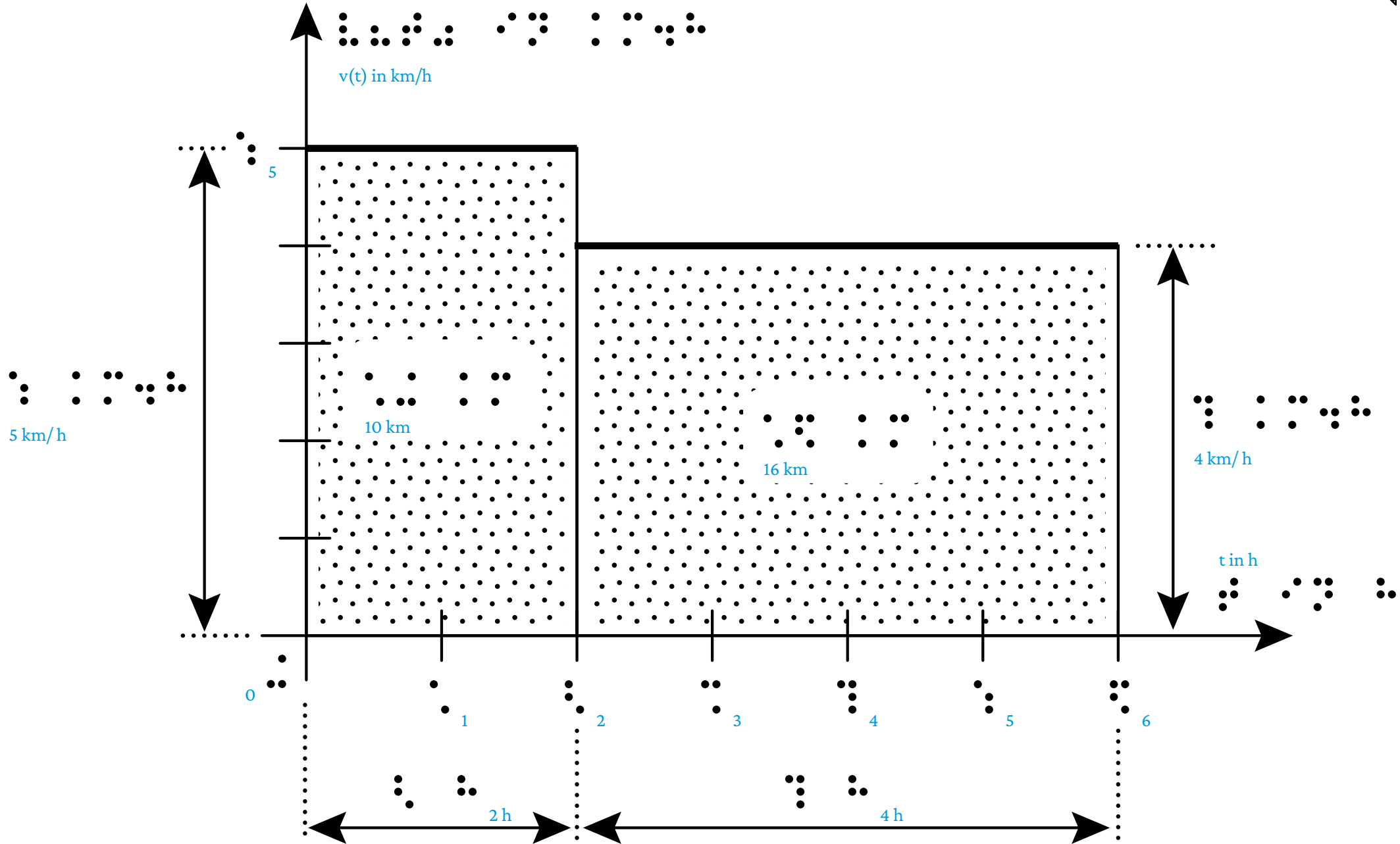
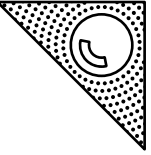


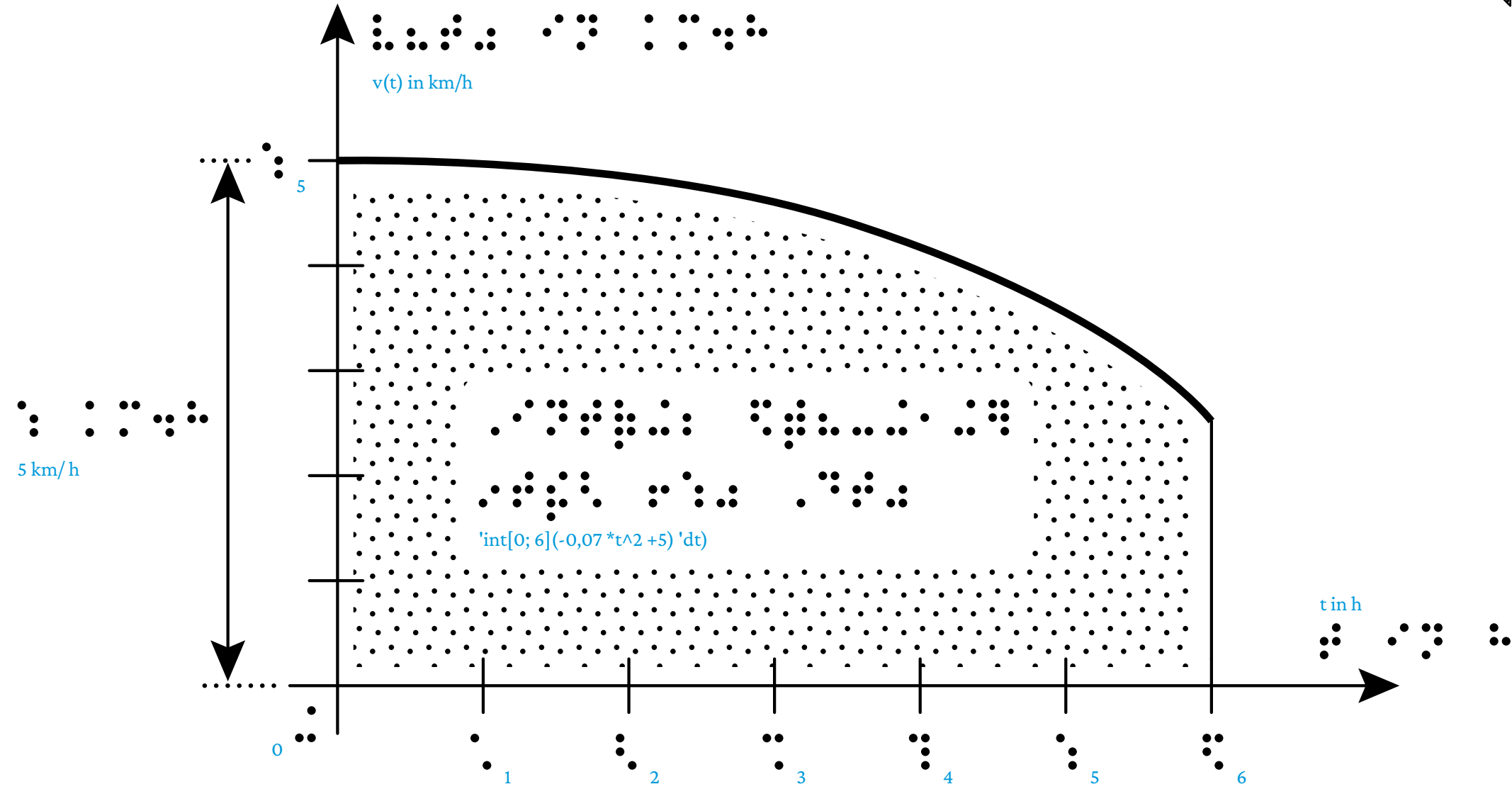
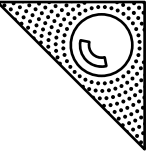
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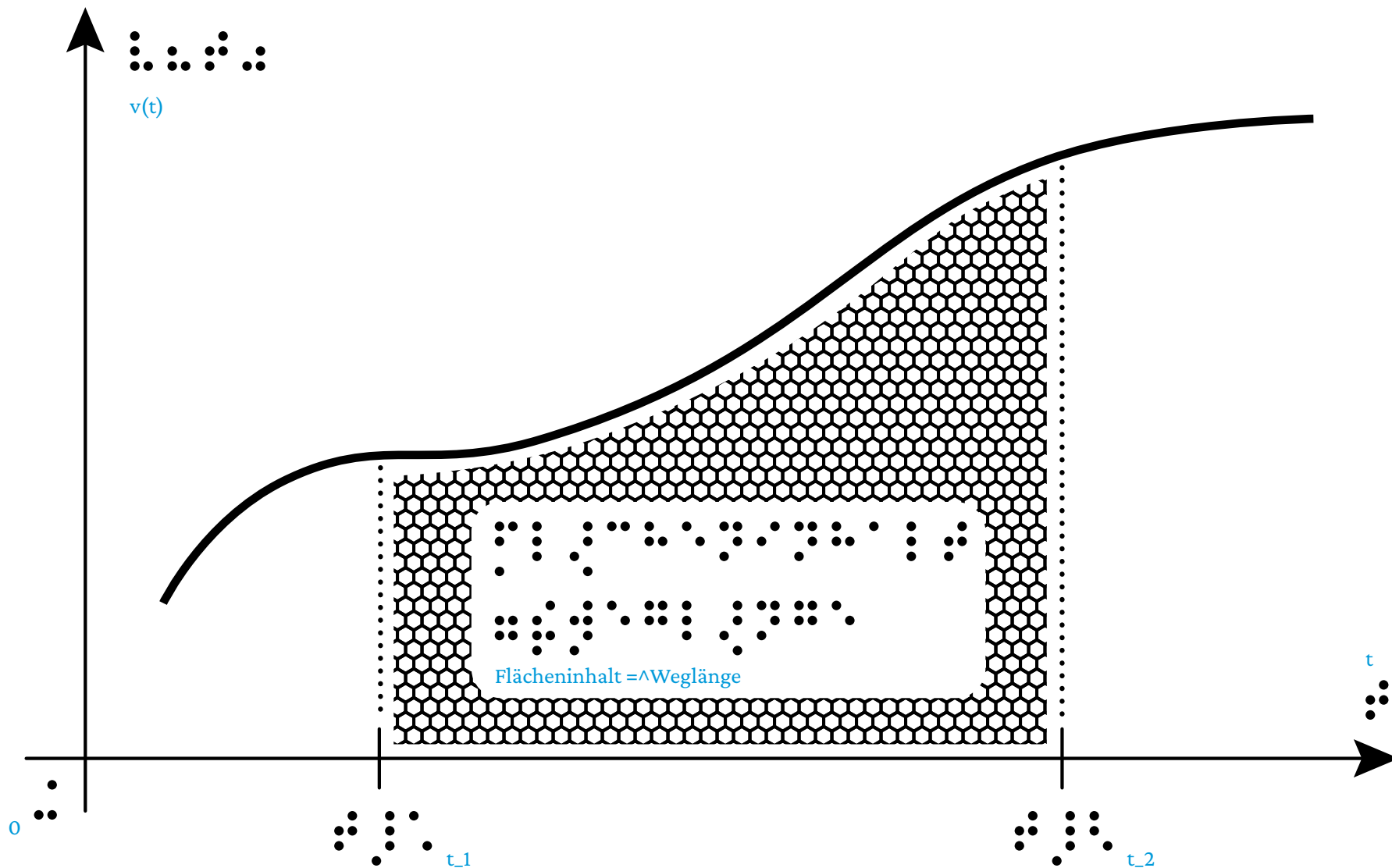
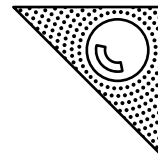
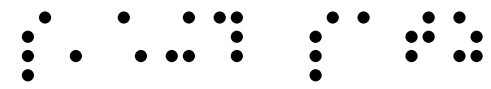
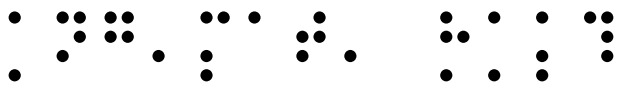
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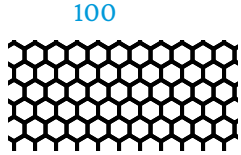
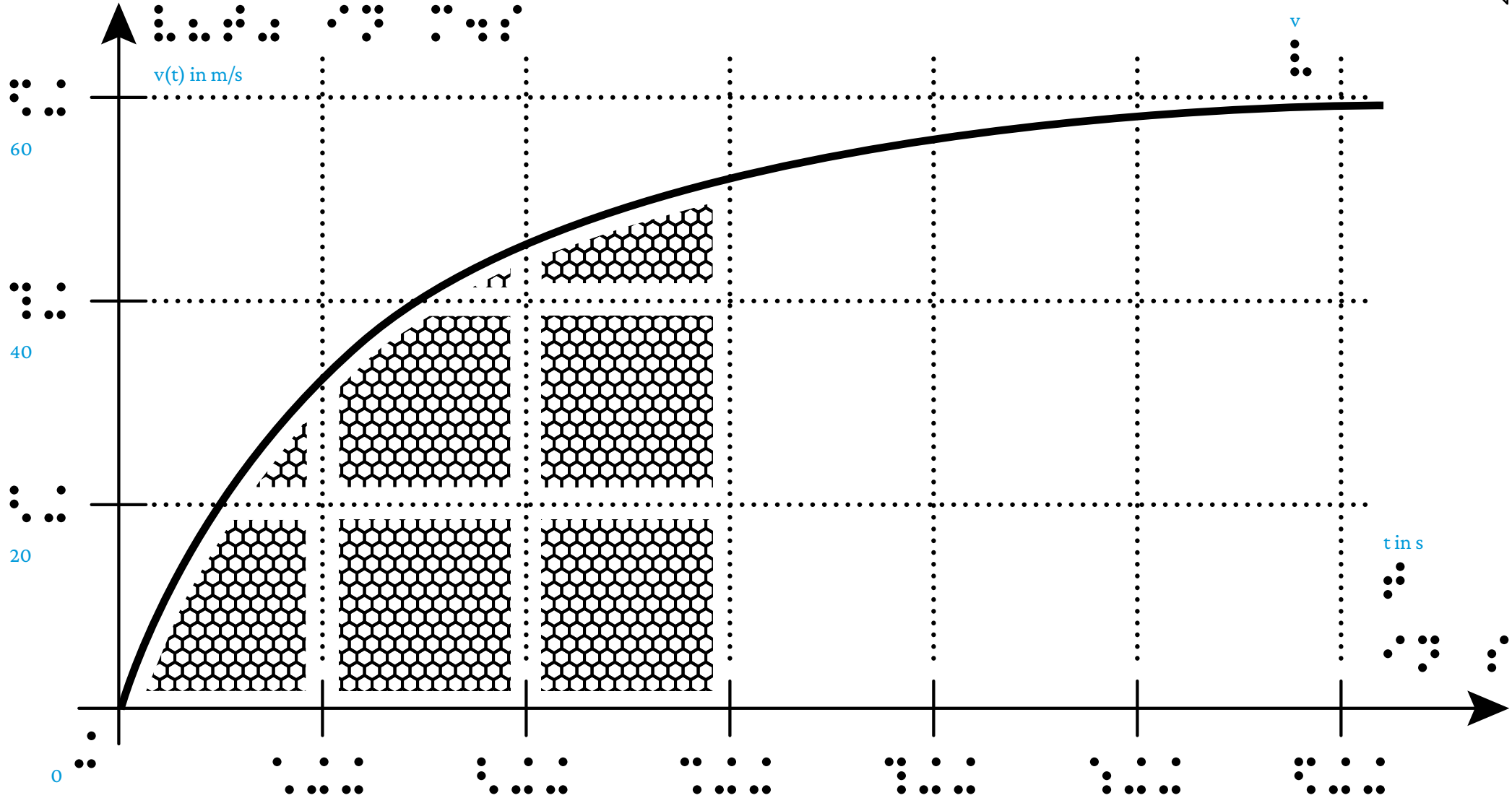
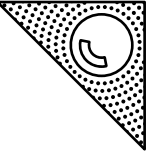
A_2



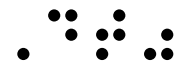
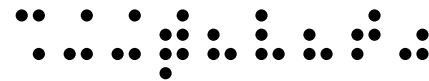
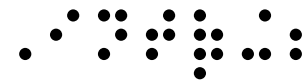


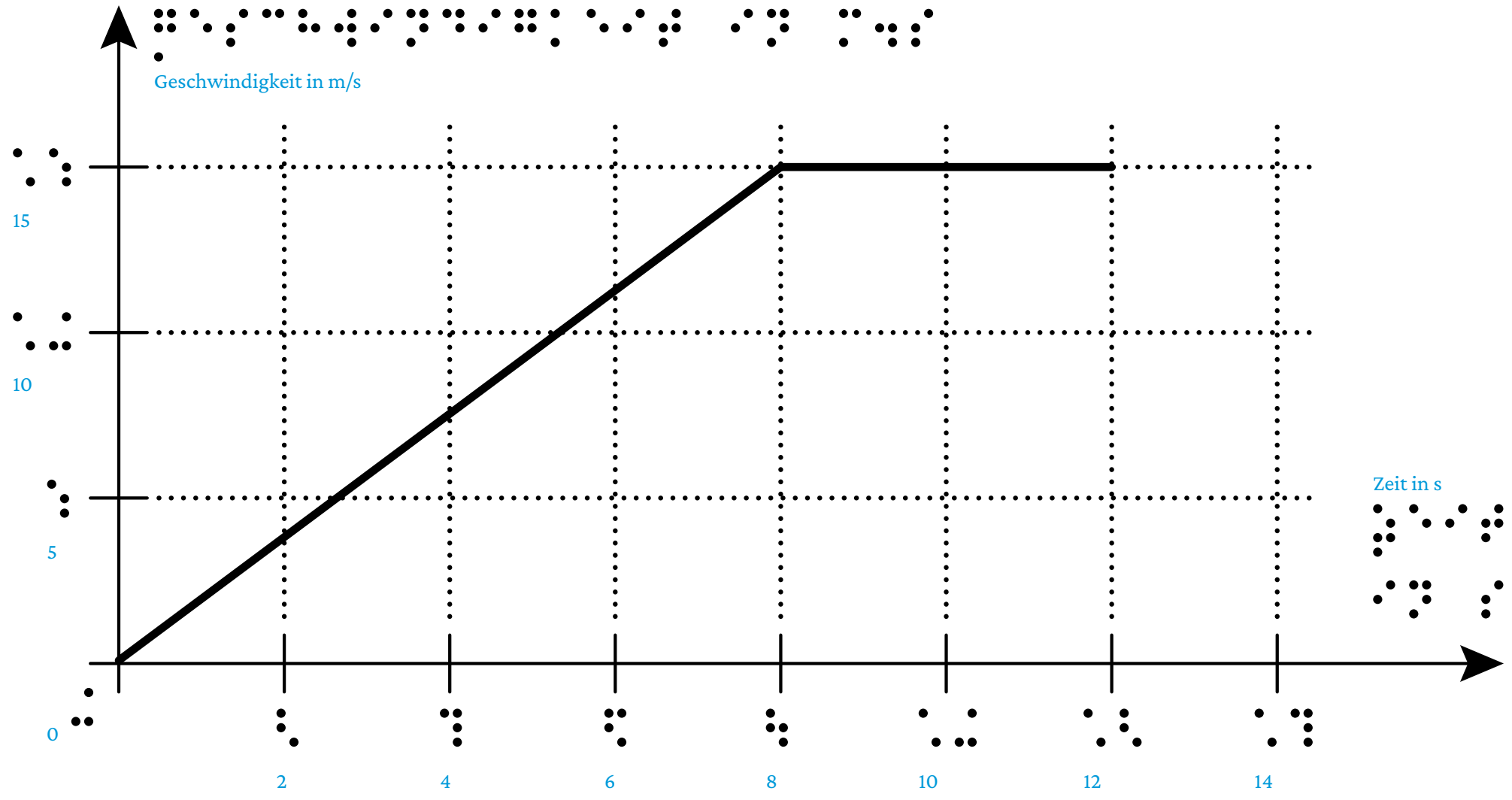
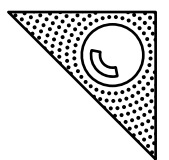
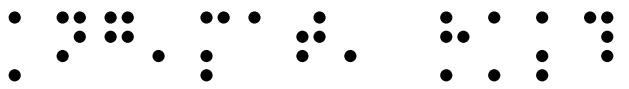


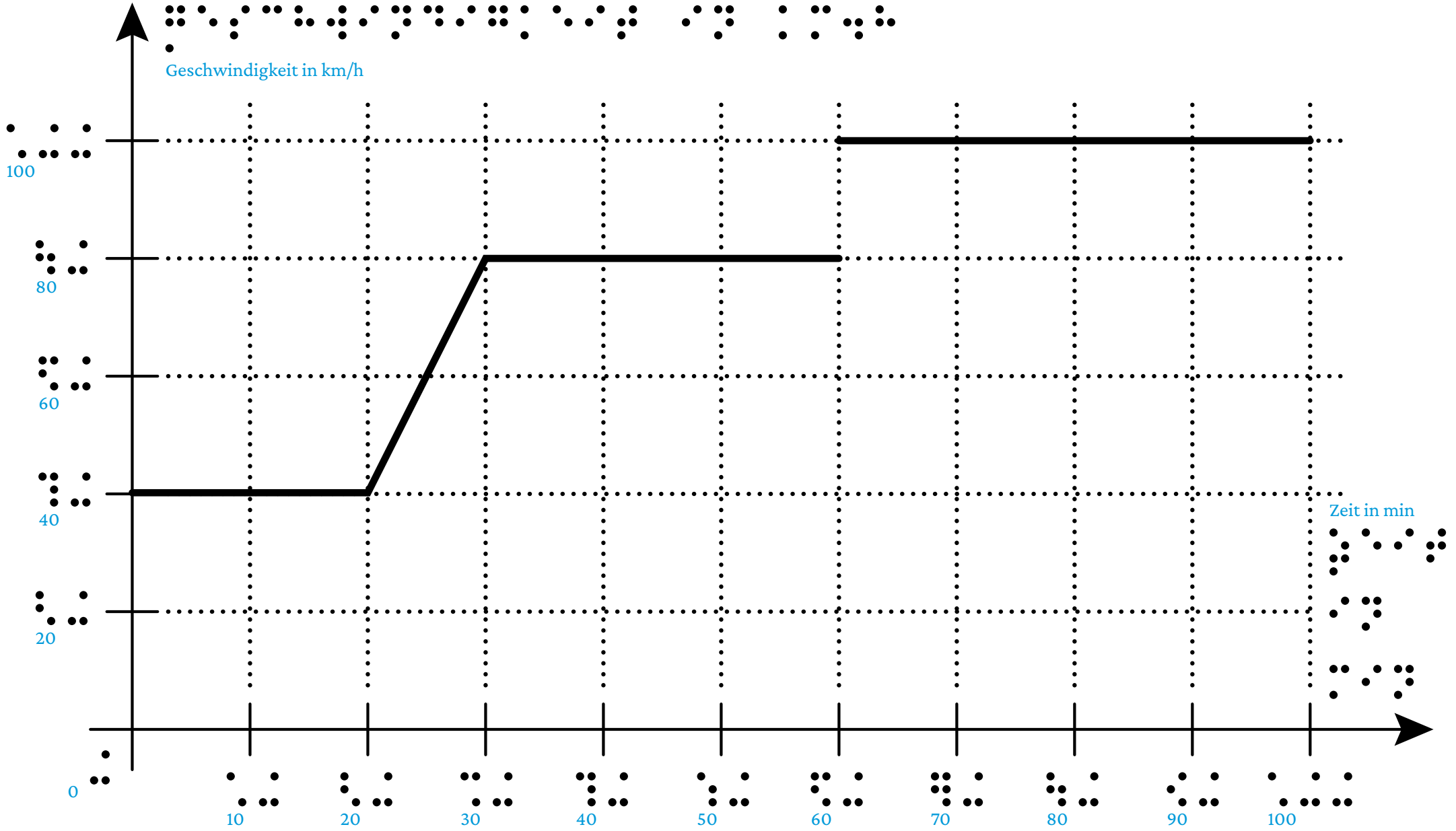
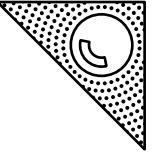


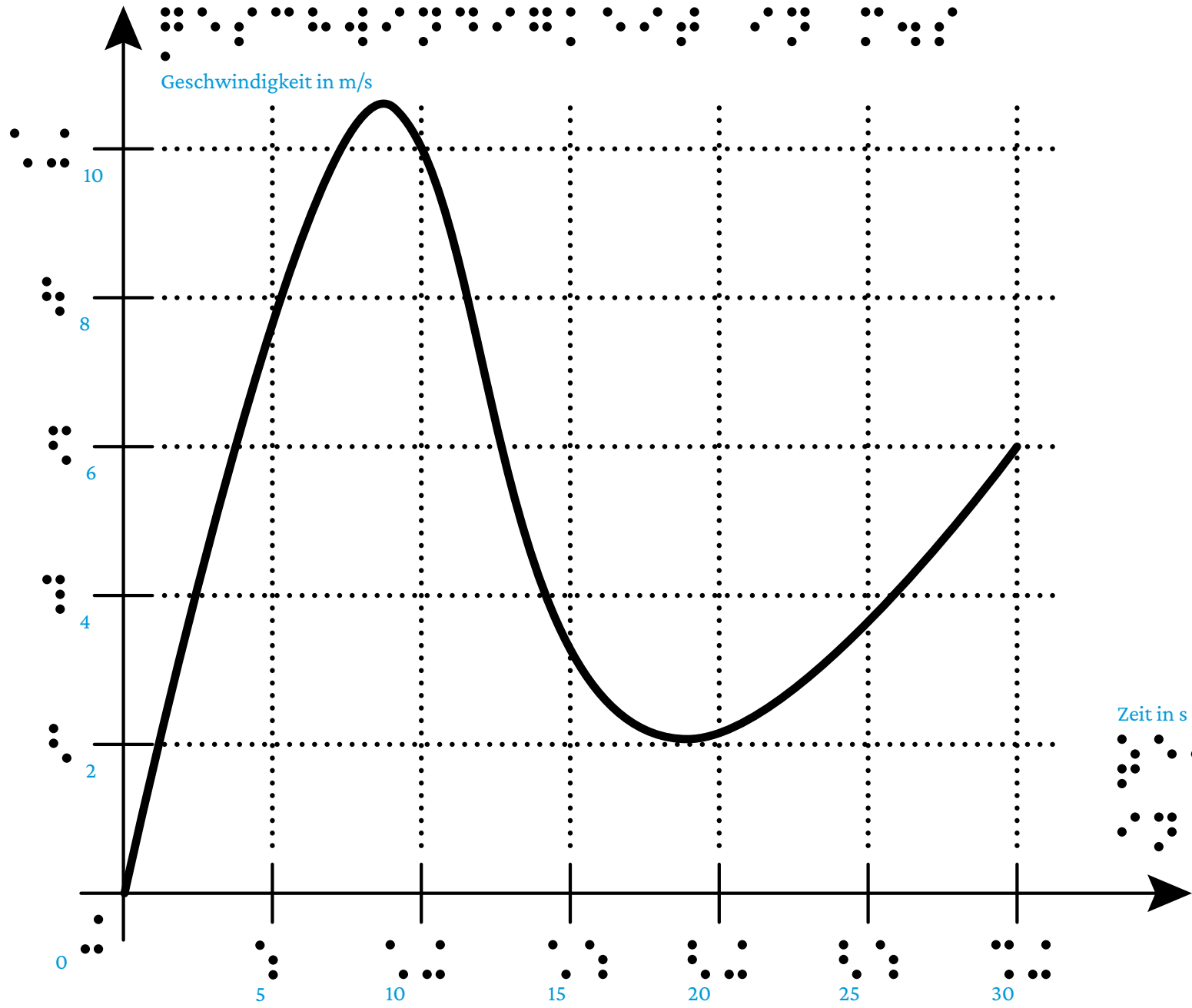
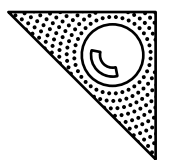


$\int_0^{300} v(t) dt$



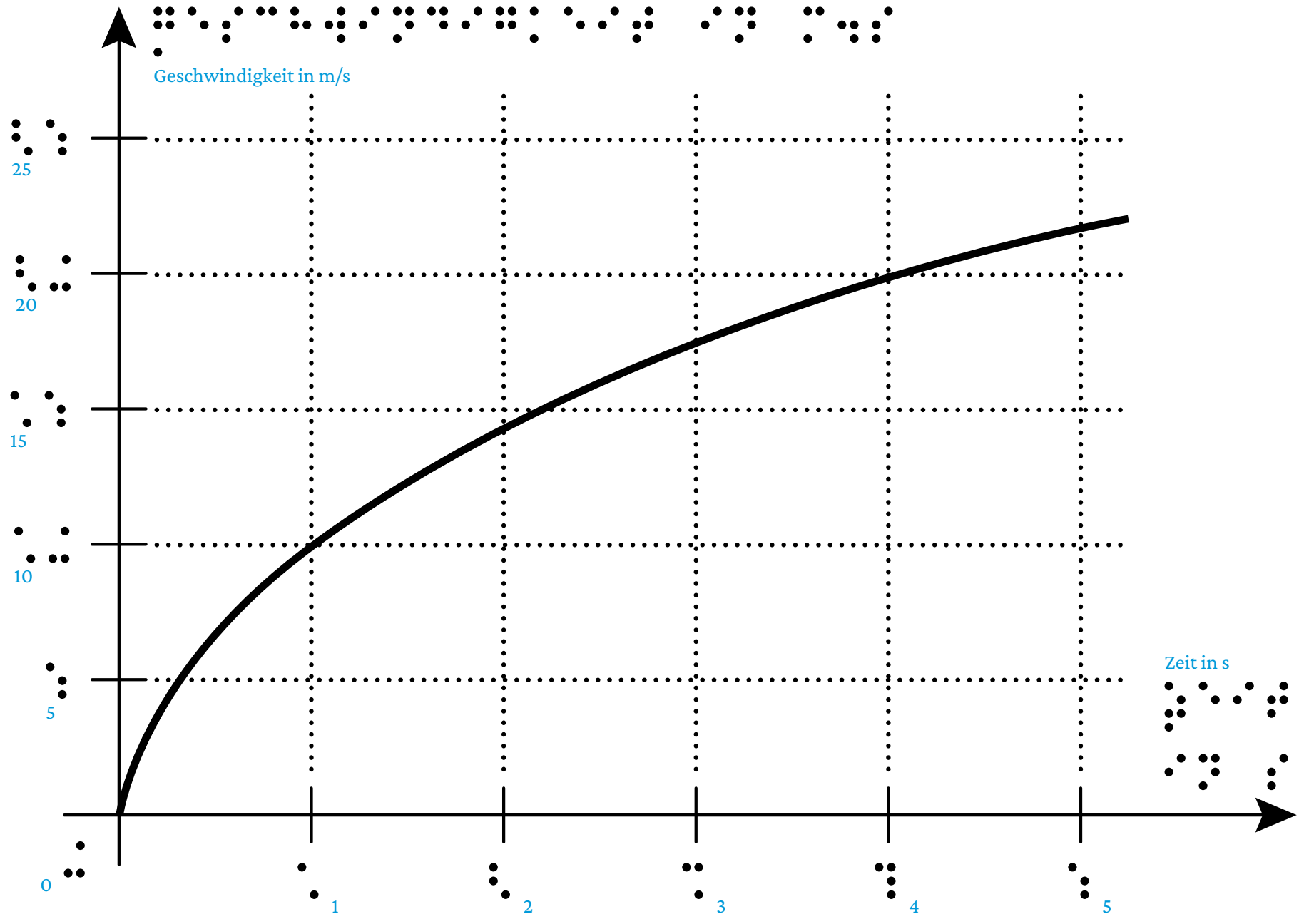
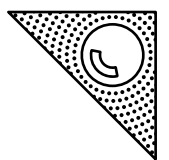


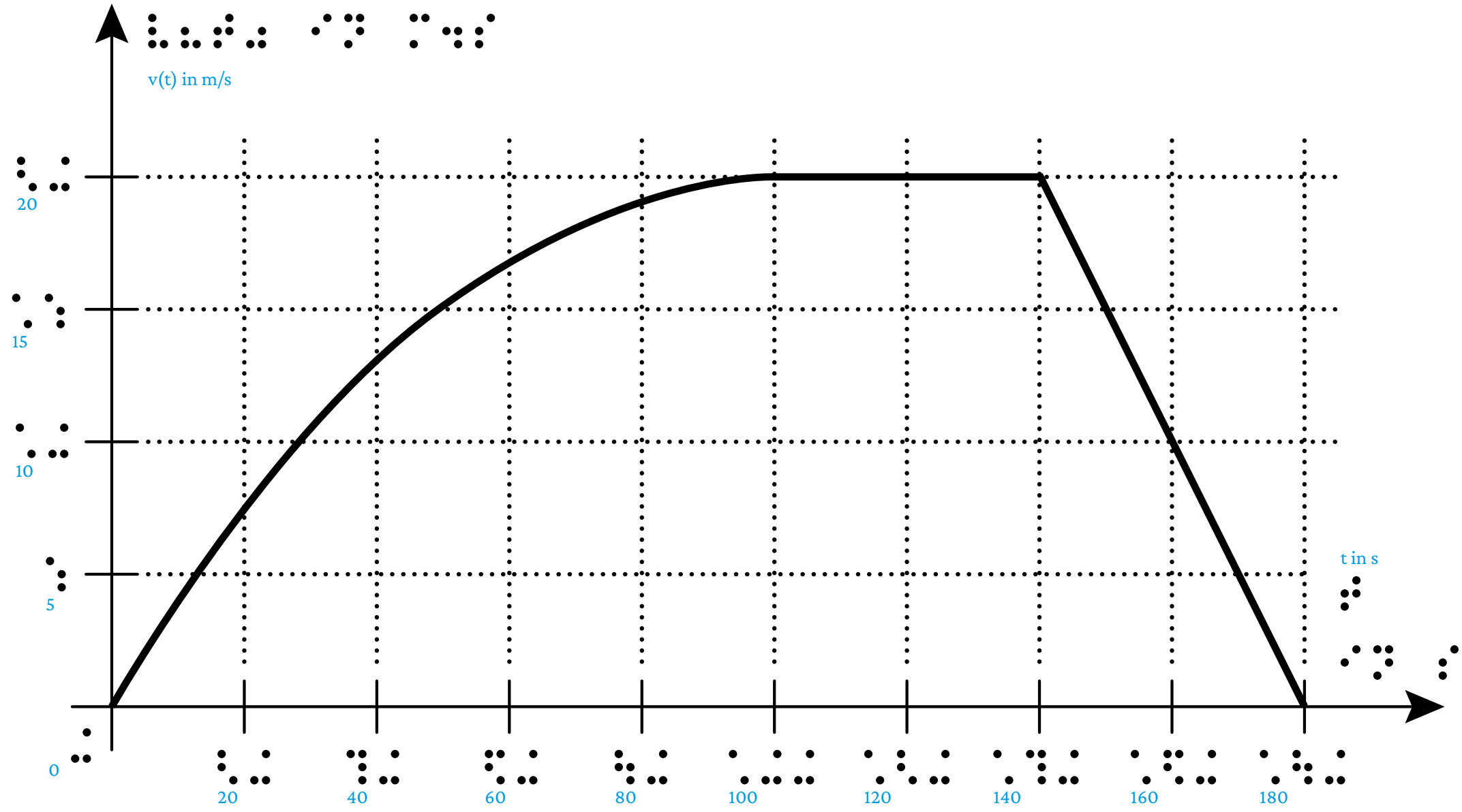
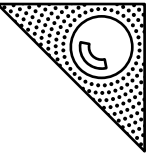
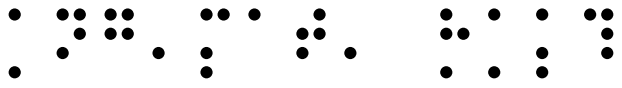


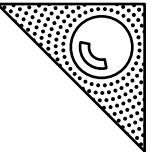


Zeit in s


Geschwindigkeit in m/s








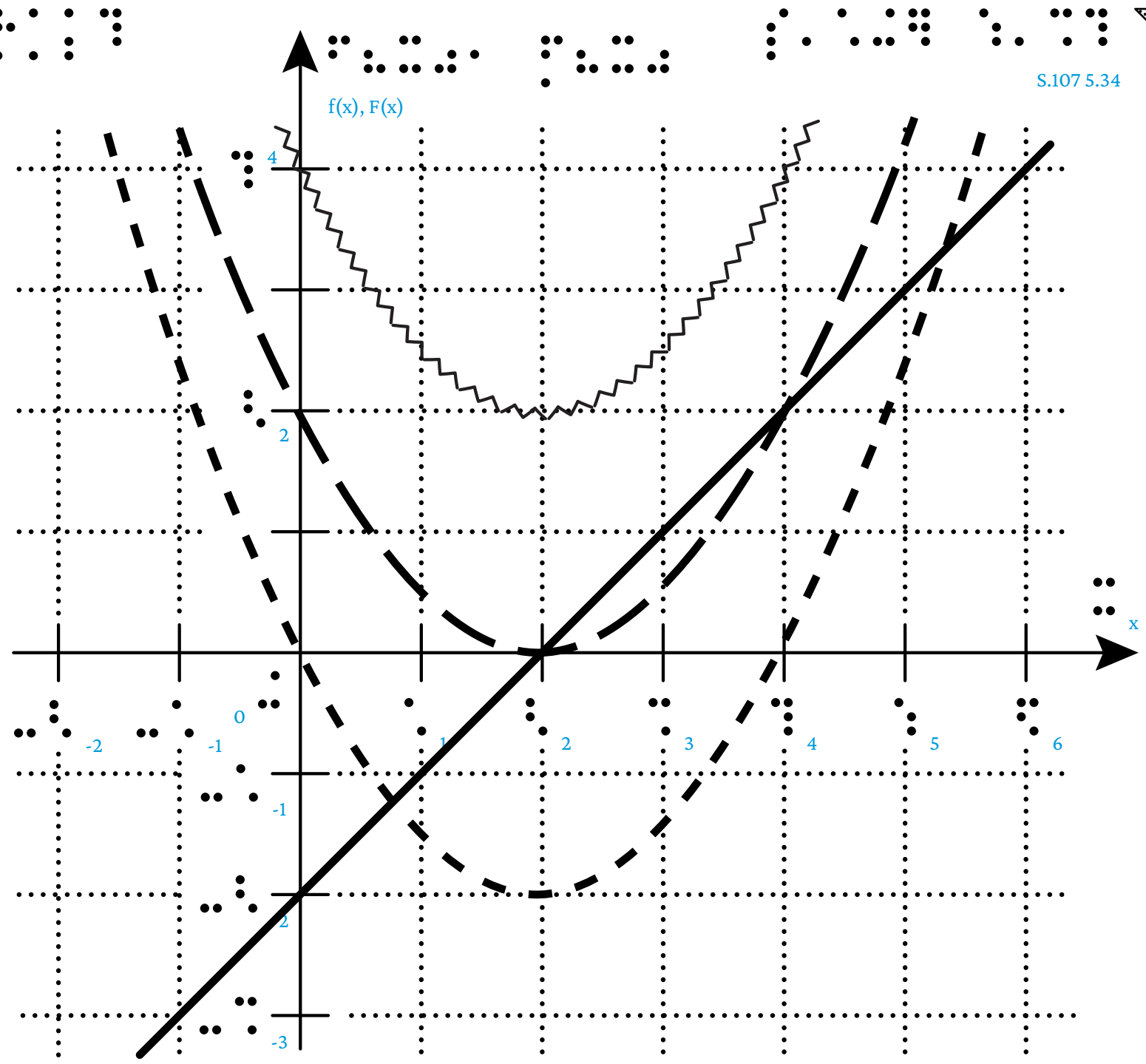
Legende:

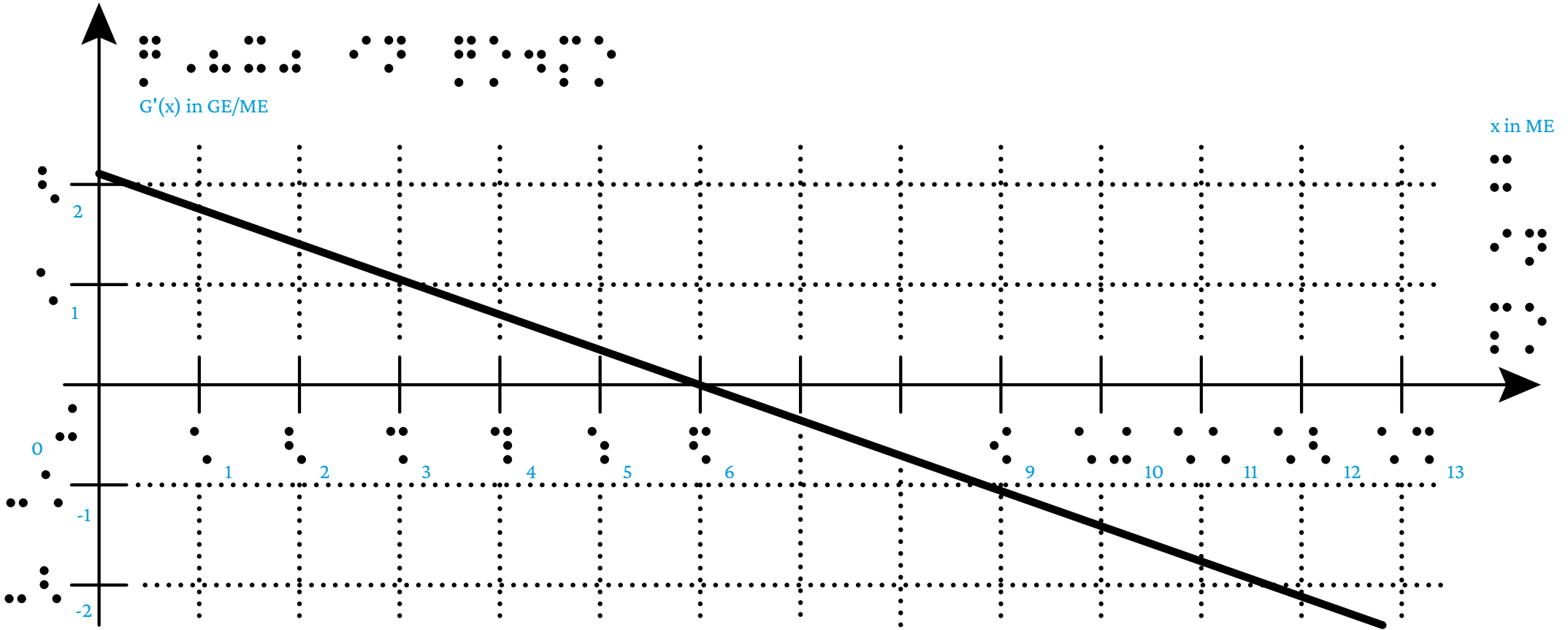
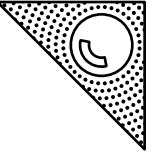
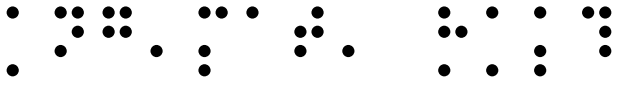
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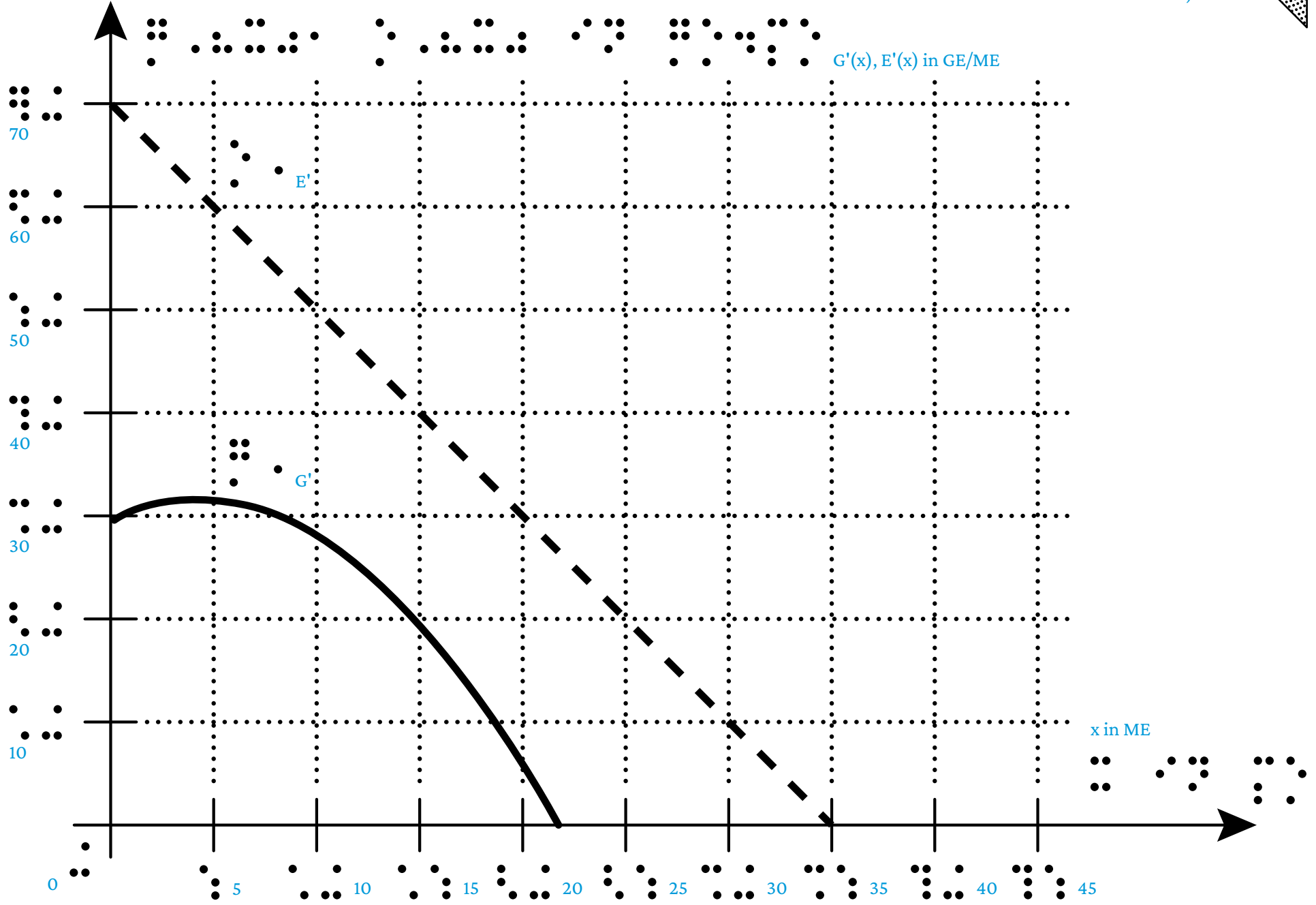
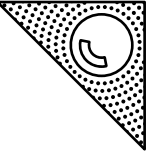
 F_1

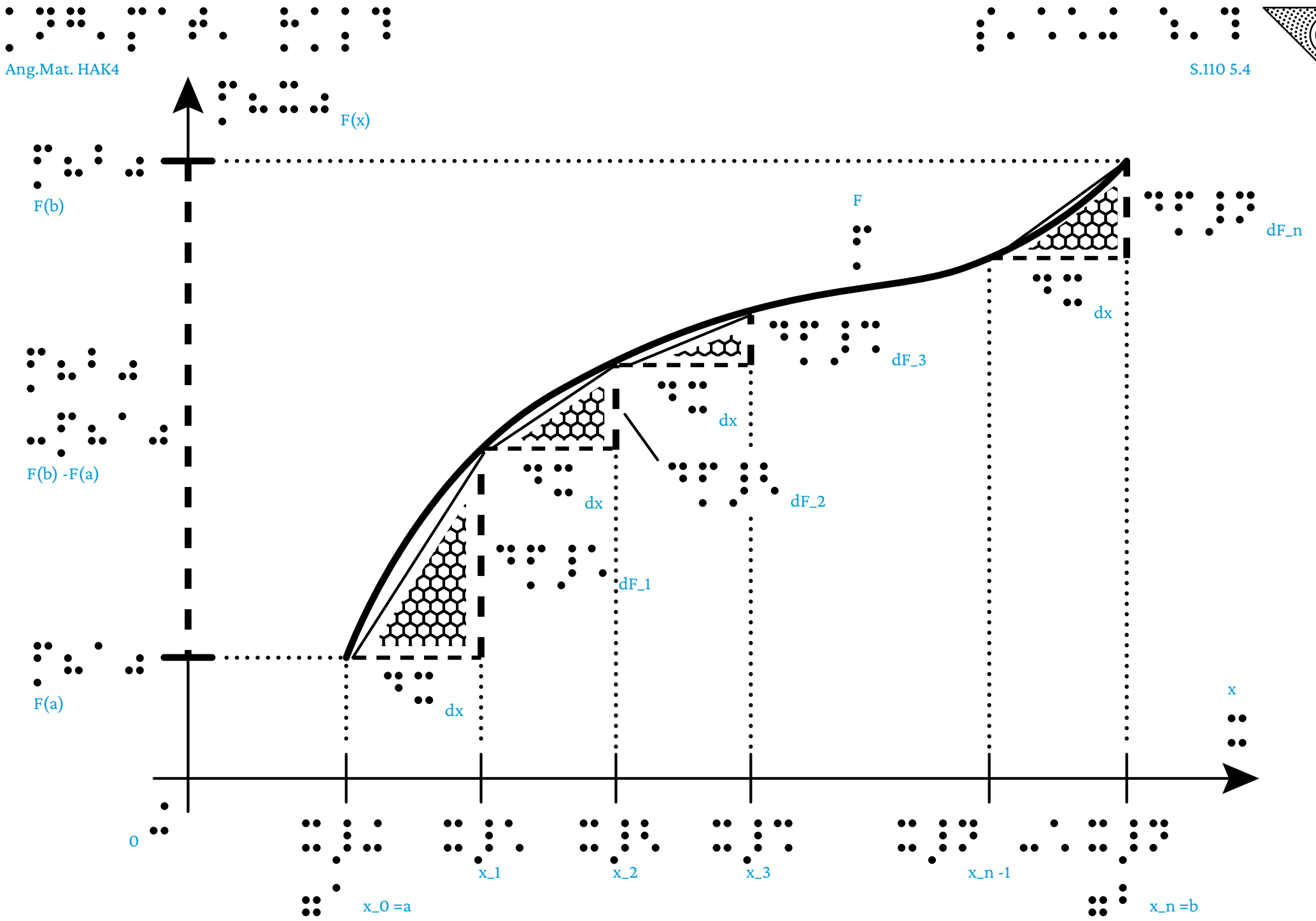
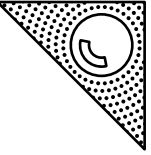
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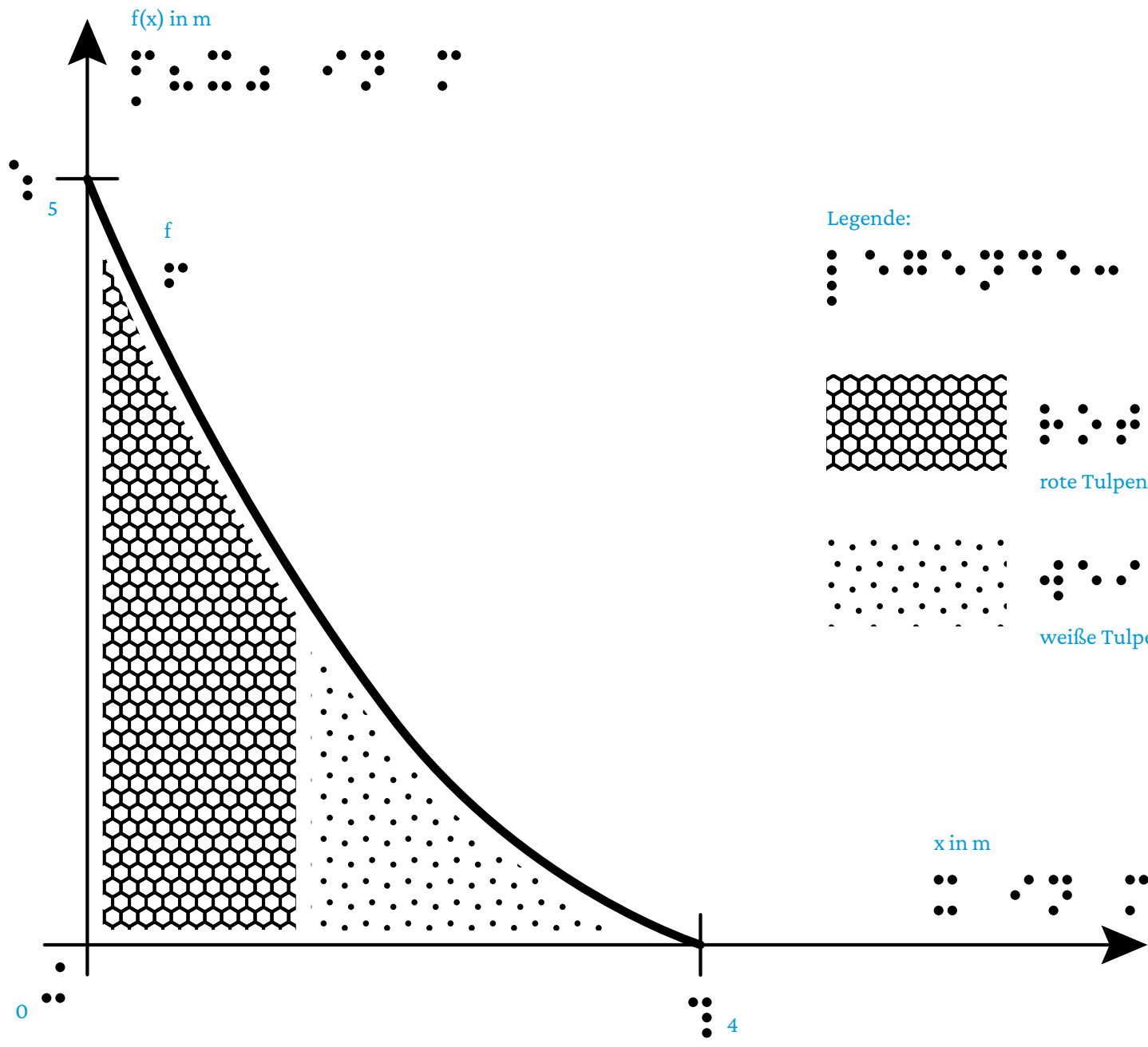
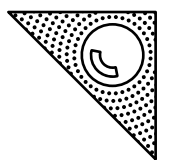
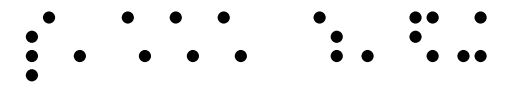
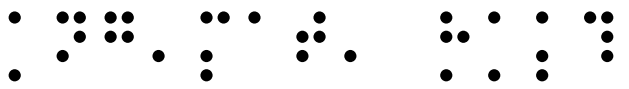
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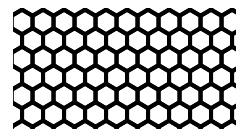
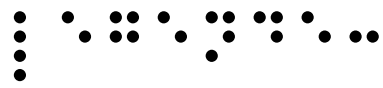




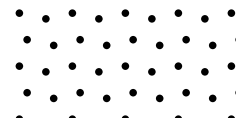




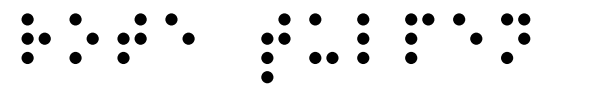
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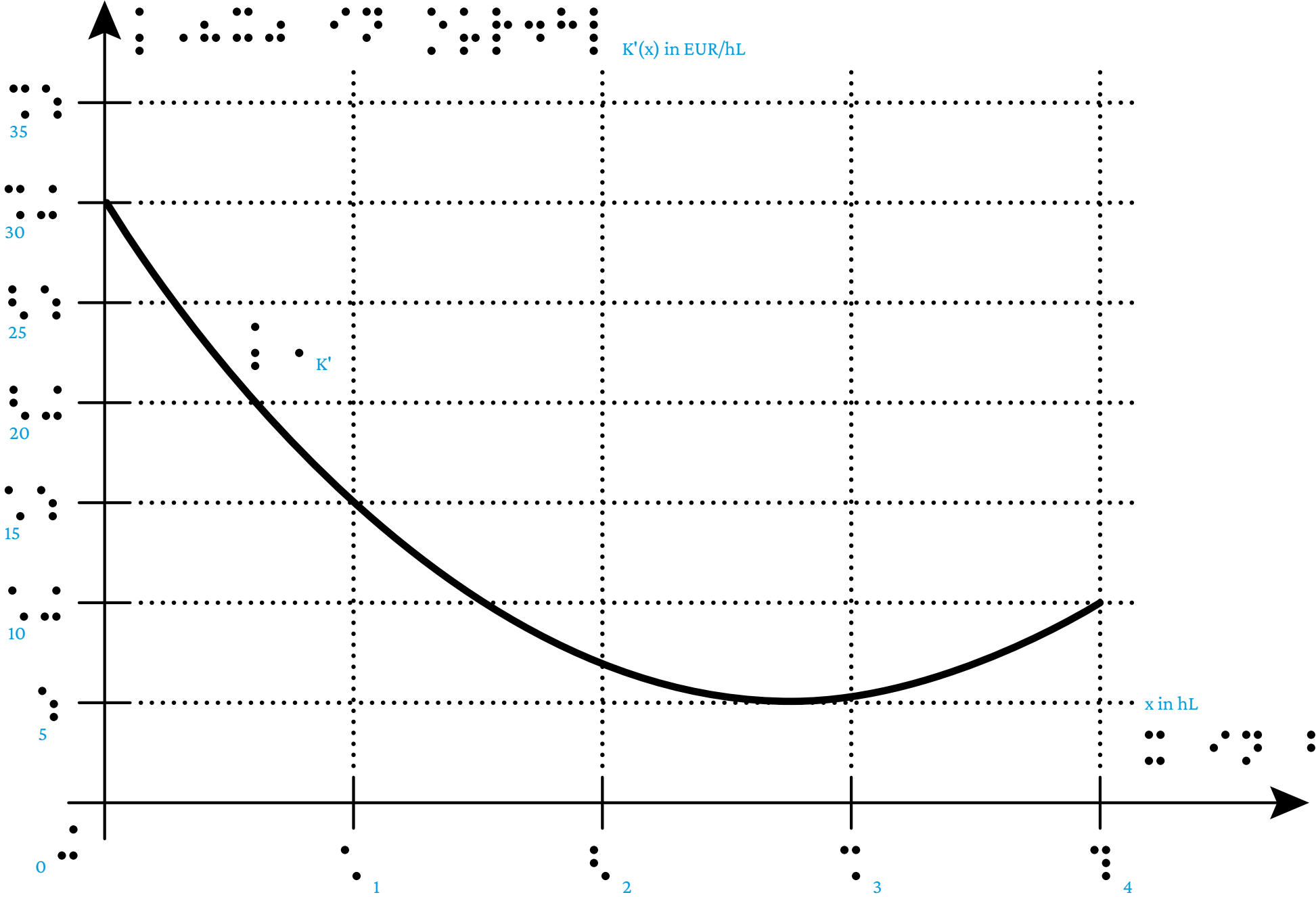
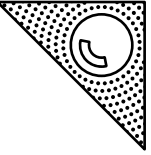


rote Tulpen



weiße Tulpen

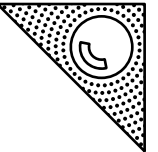




Angewandte Mathematik

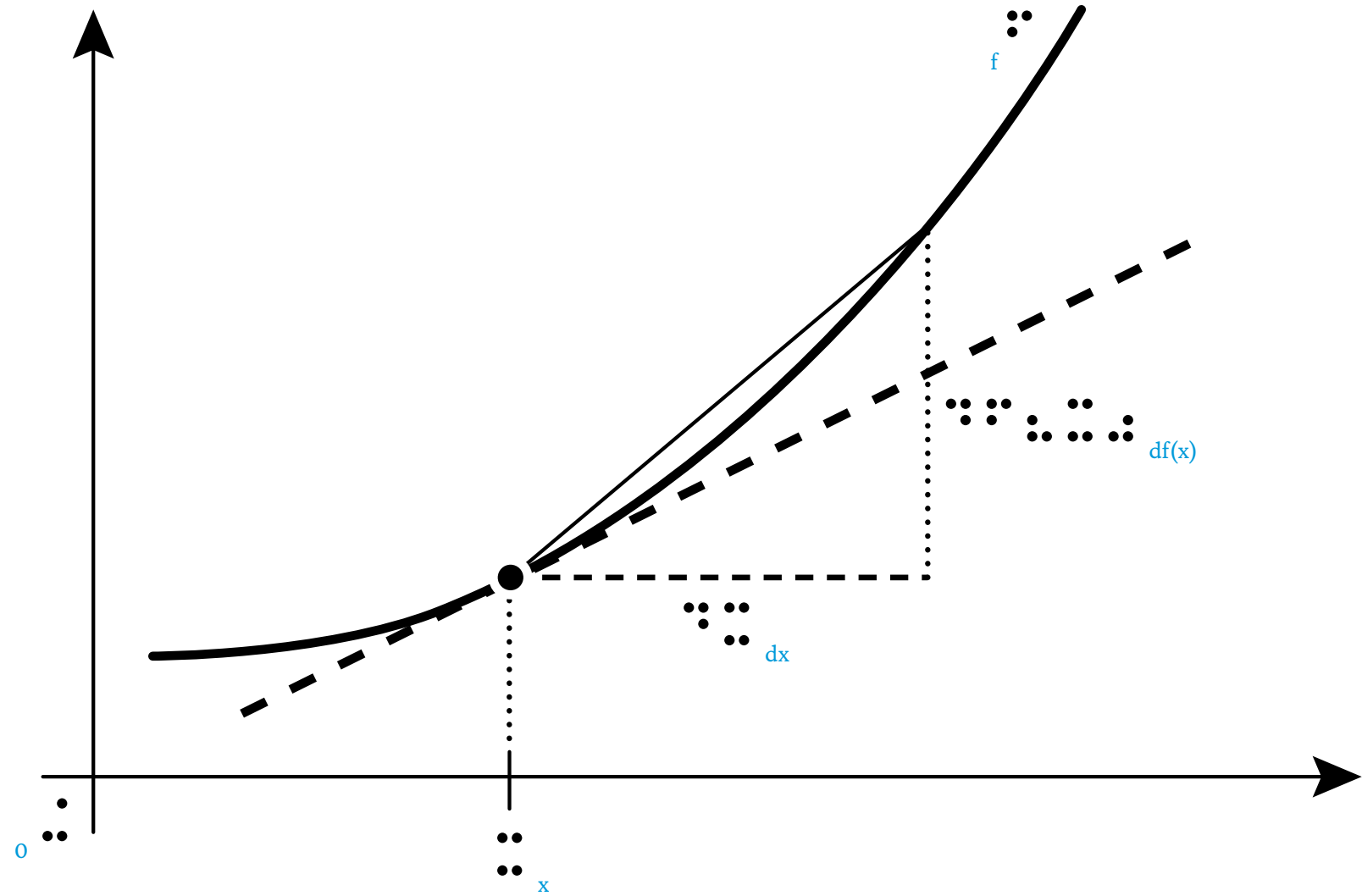
Ang.Mat. HAK4

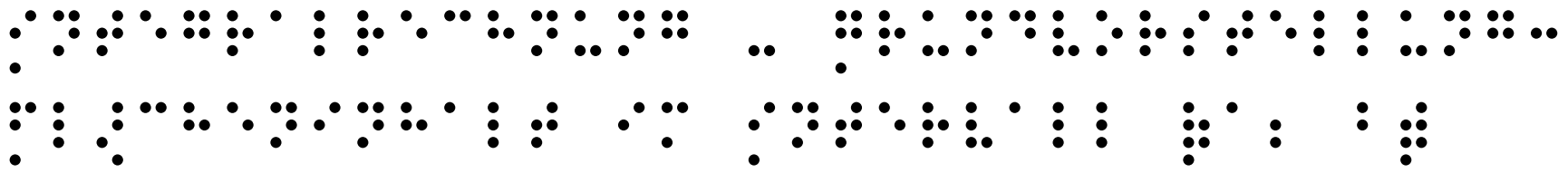
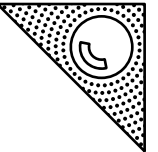
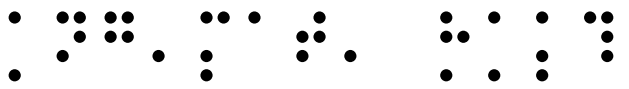
S.112 5.5



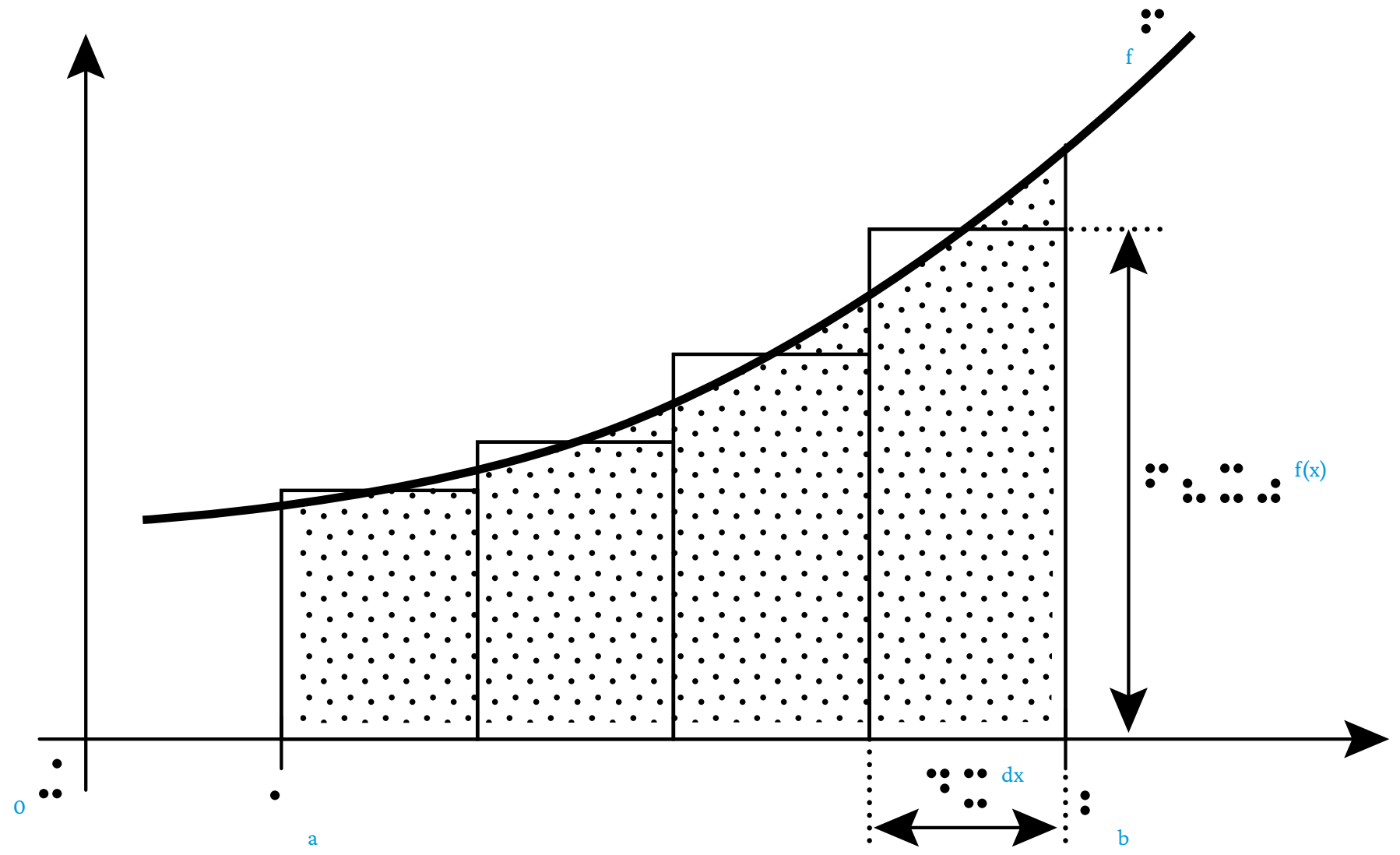
Differentialrechnung - Grundvorstellung: Steigung an der Stelle x

Differentialrechnung - Grundvorstellung: Steigung an der Stelle x

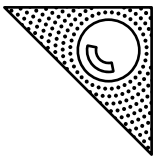




Integralrechnung - Grundvorstellung: Flächeninhalt im Intervall [a; b]

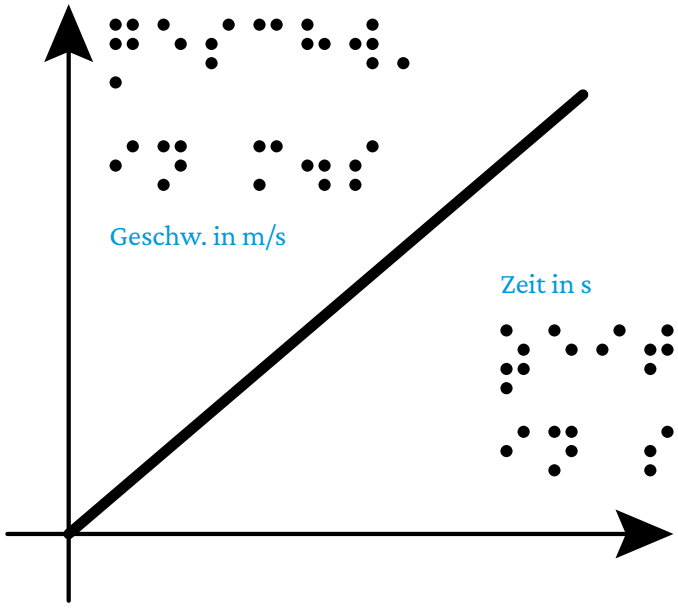


Ang.Mat. HAK4



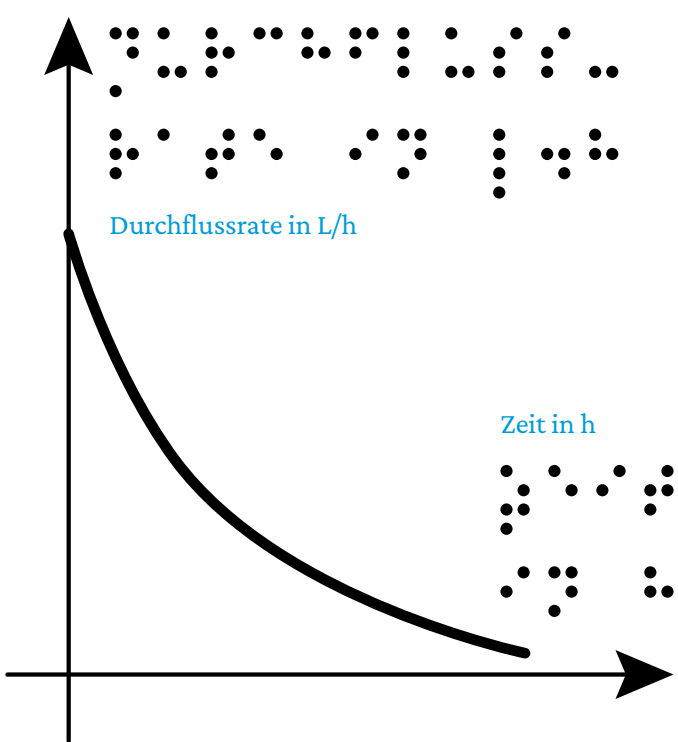
Integralrechnung - Anwendungsbeispiele:

1) Geschwindigkeit -> Weg

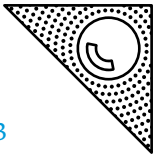


Geschwindigkeit * Zeit in m/s * s = Weg in m

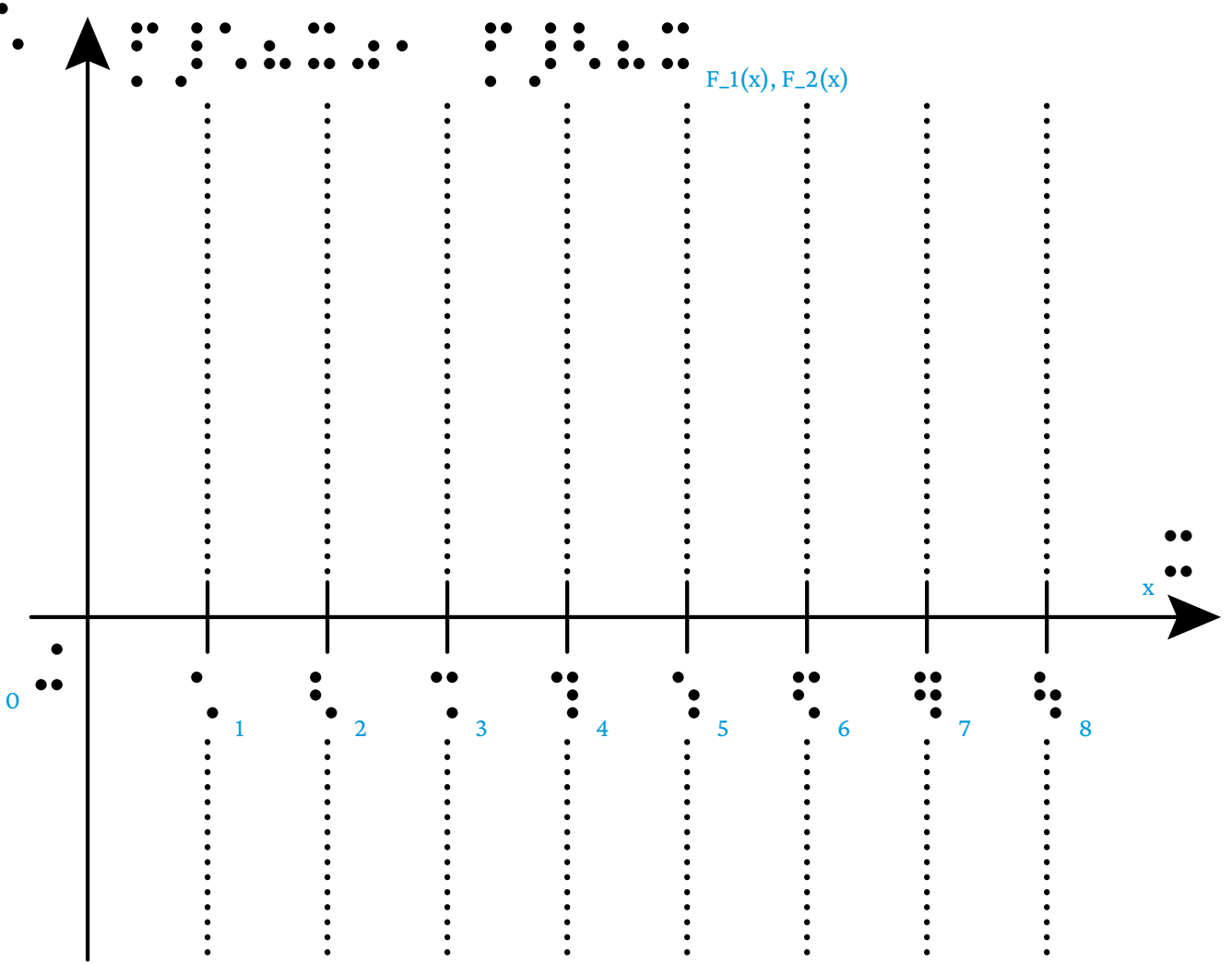
2) Änderungsrate -> Bestand



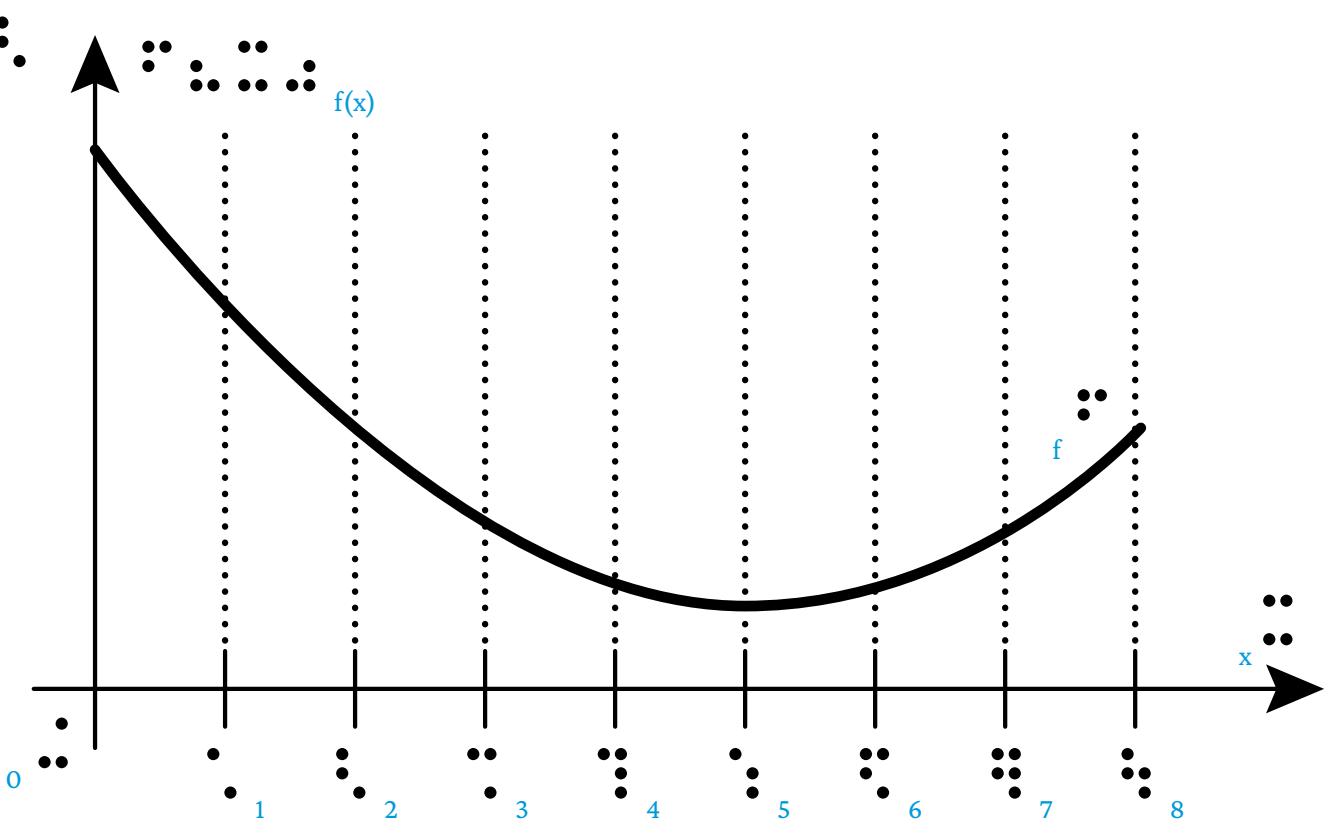
Durchflussrate * Zeit in L/h * h = durchgeflossenes Volumen in L

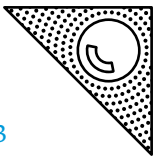
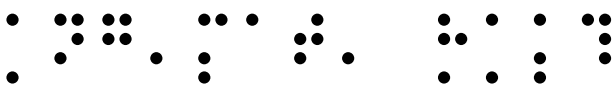


A.1

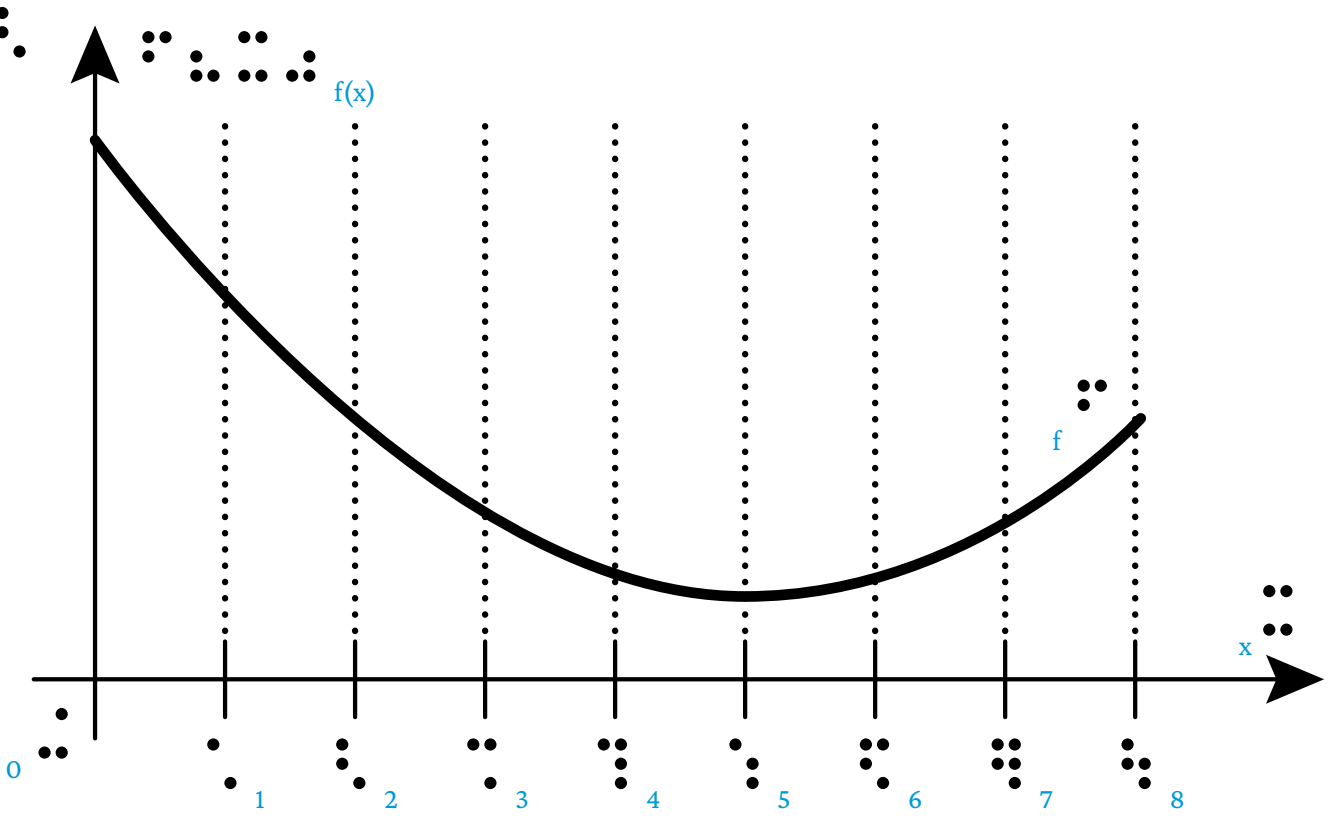


A.2

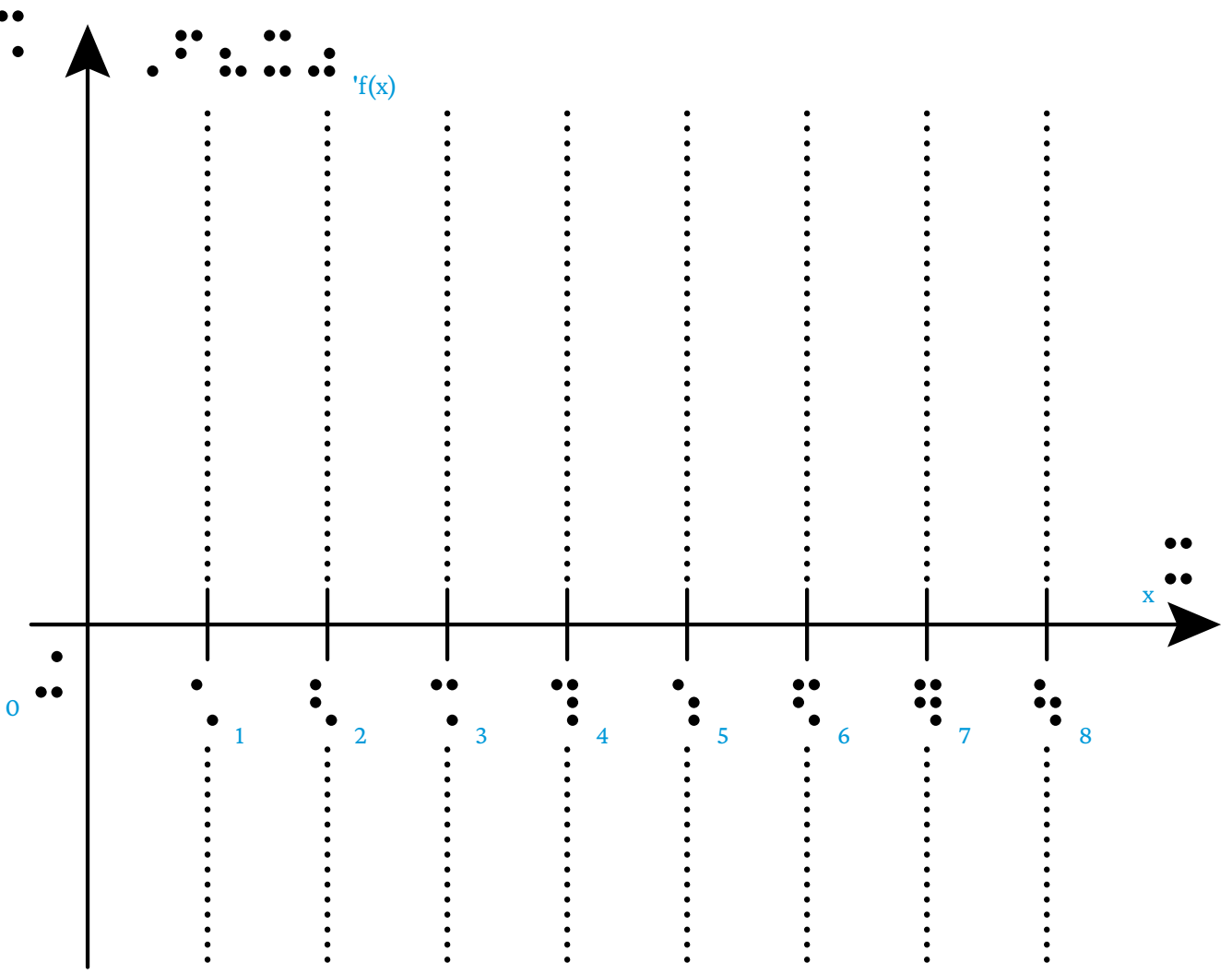


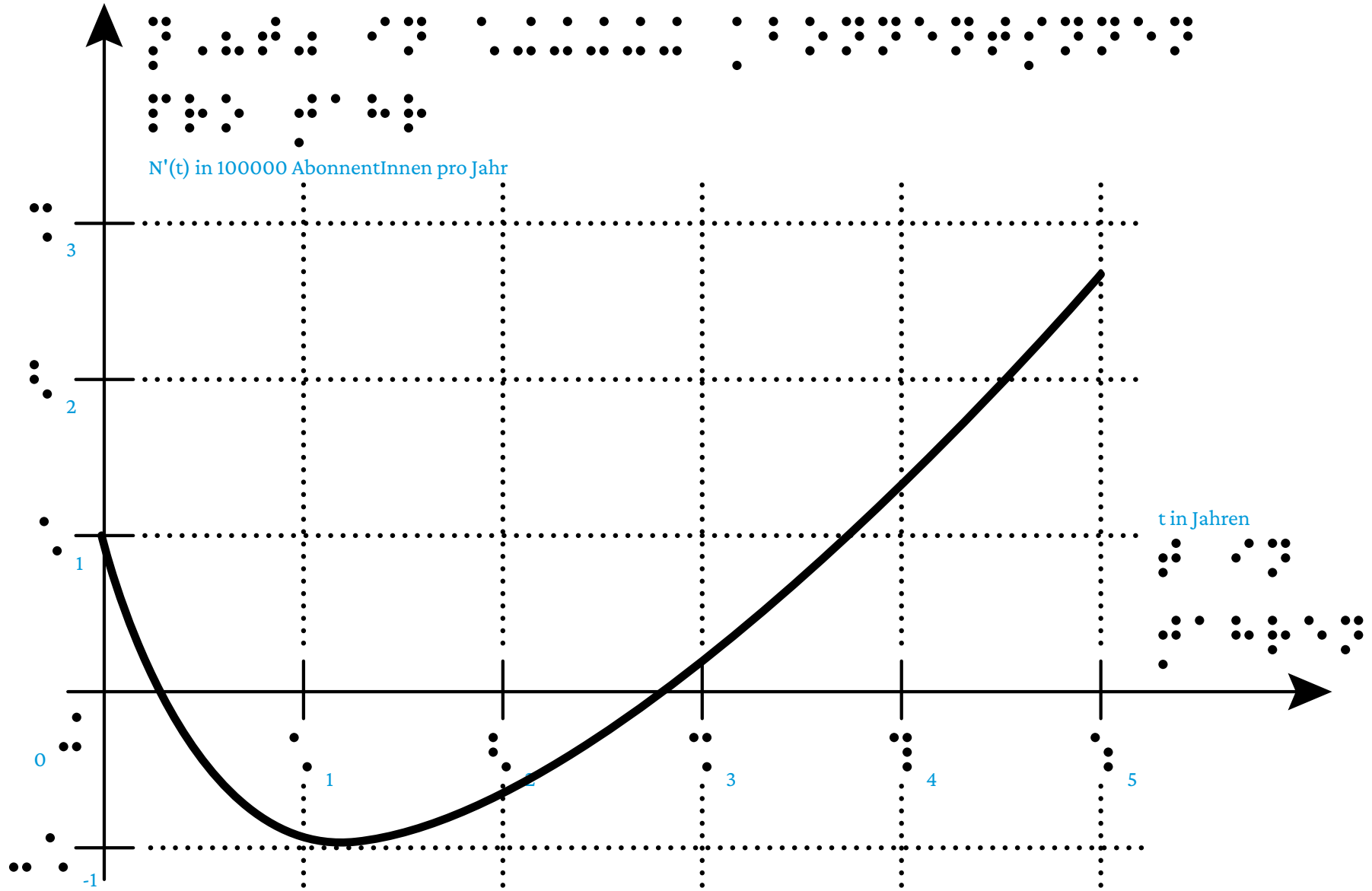
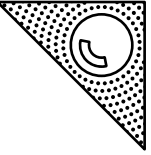


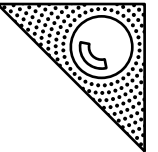
A. 2



A. 3





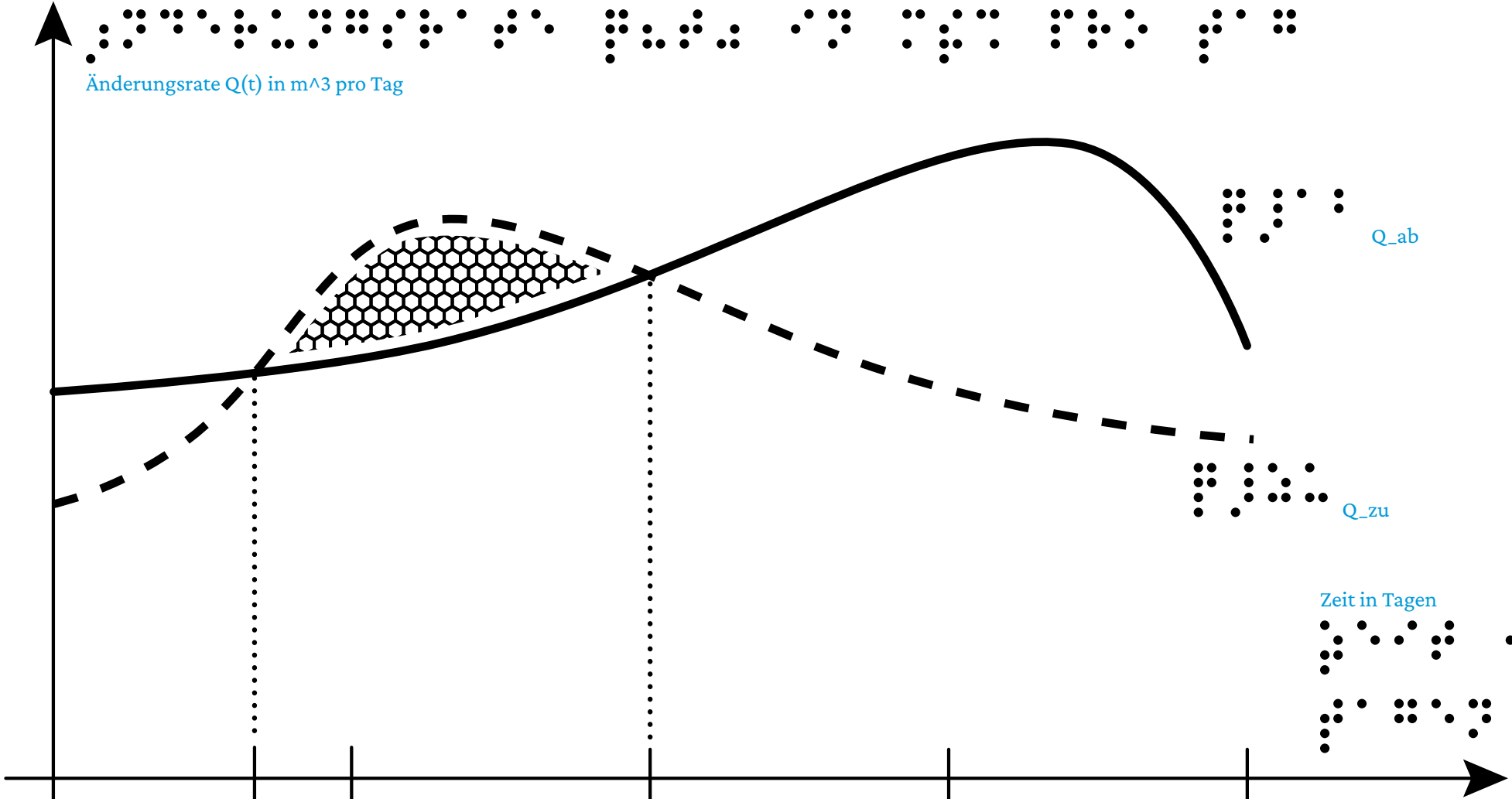


Änderungsrate $Q(t)$ in m^3 pro Tag

Q_{ab}

Q_{zu}

Zeit in Tagen



0

58

91

182

274

365

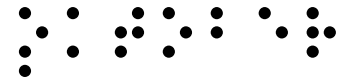
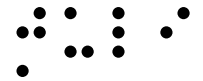
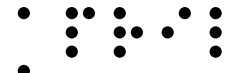
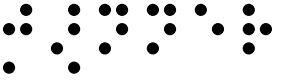
Jänner

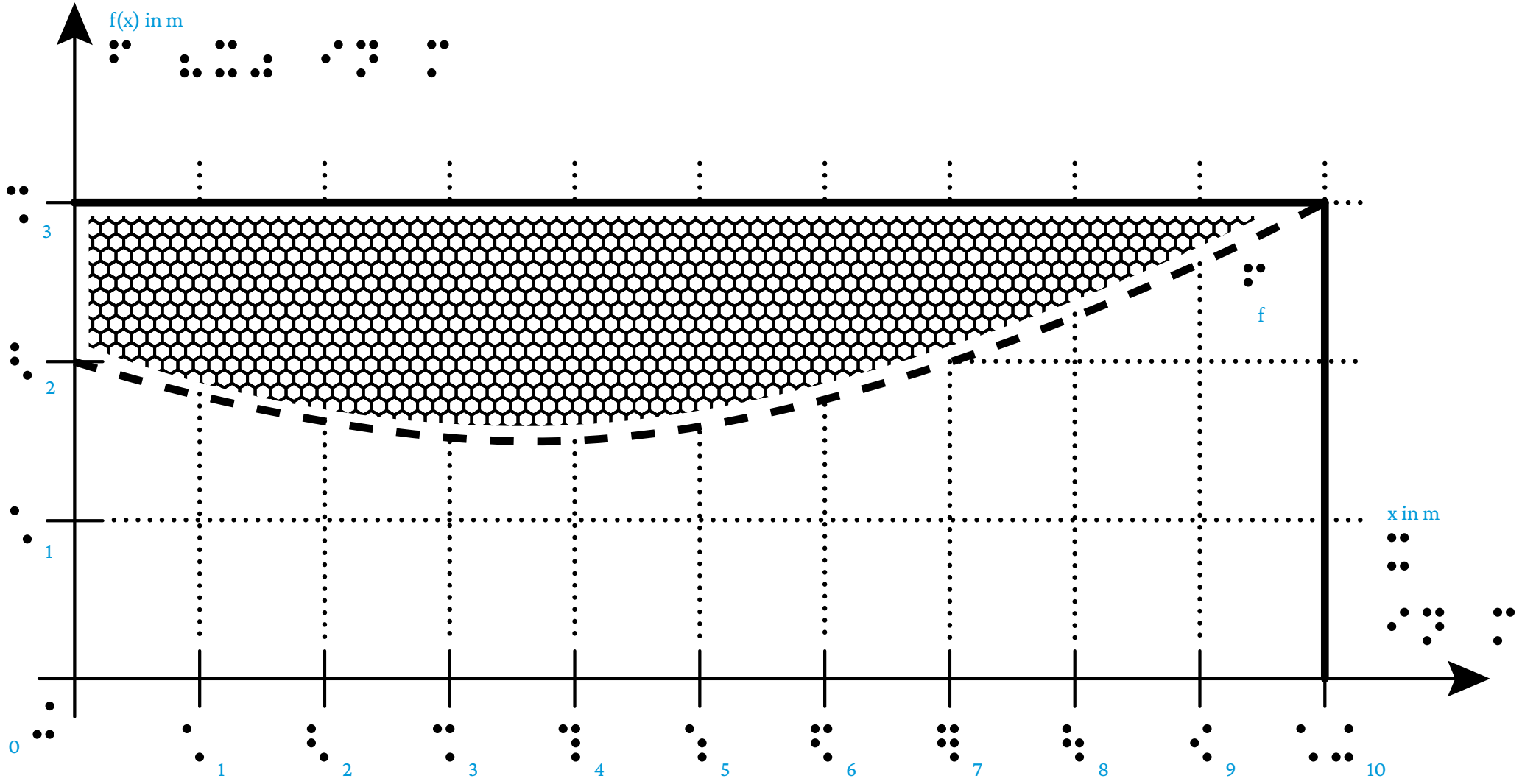
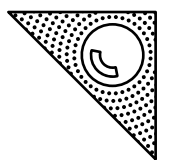
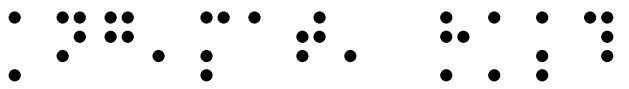
April

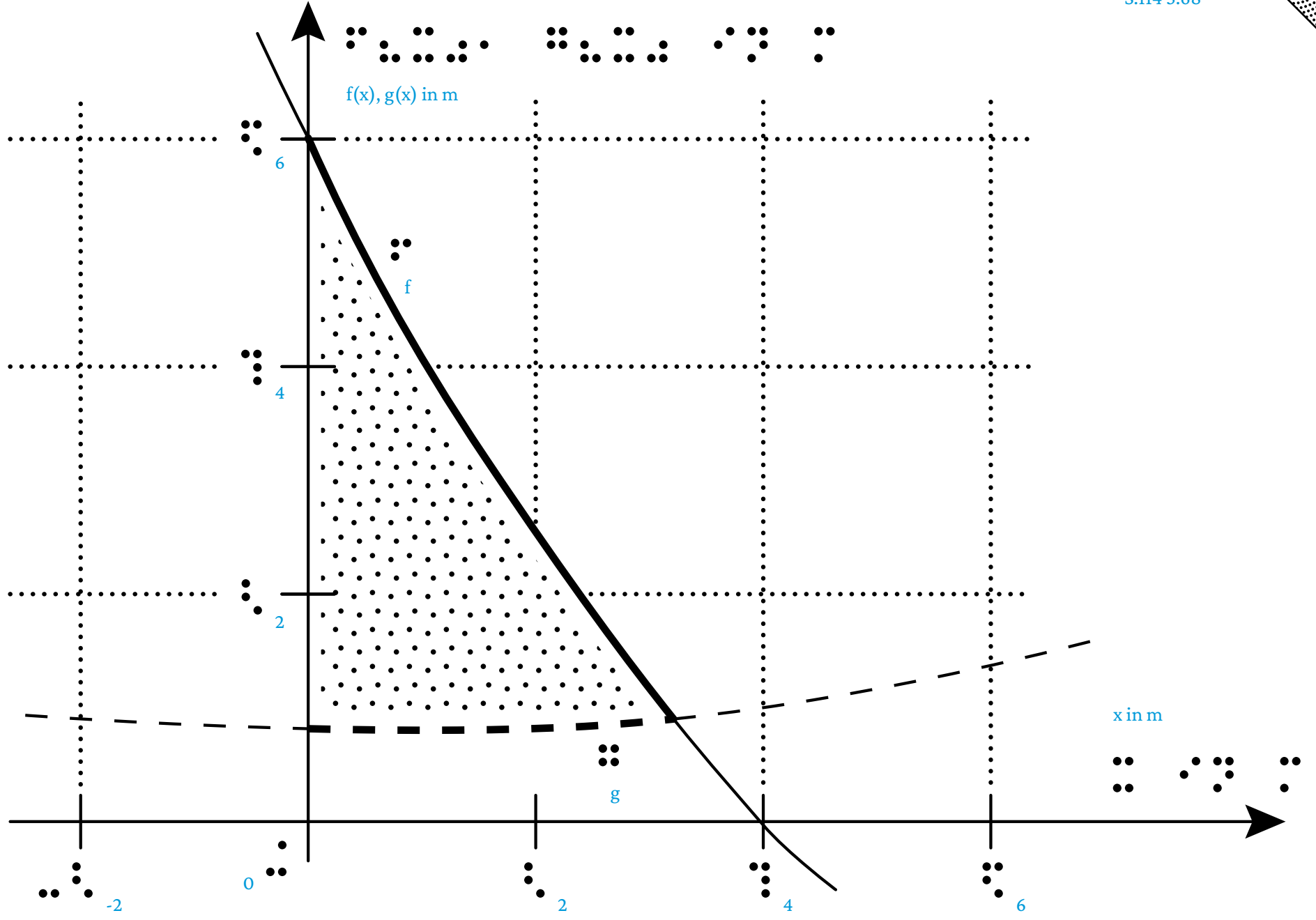
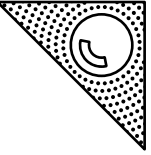
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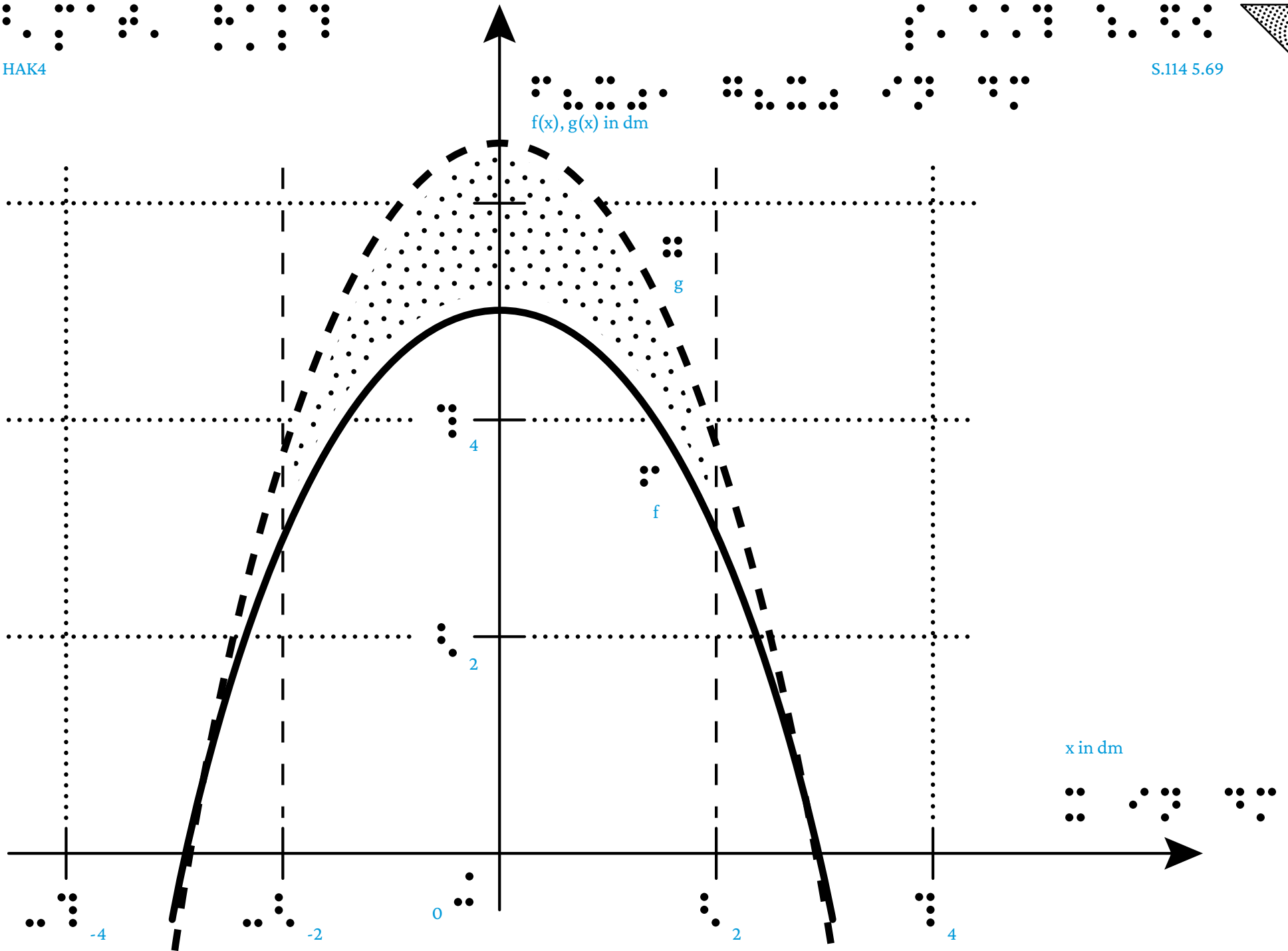
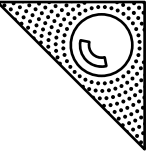
Oktober

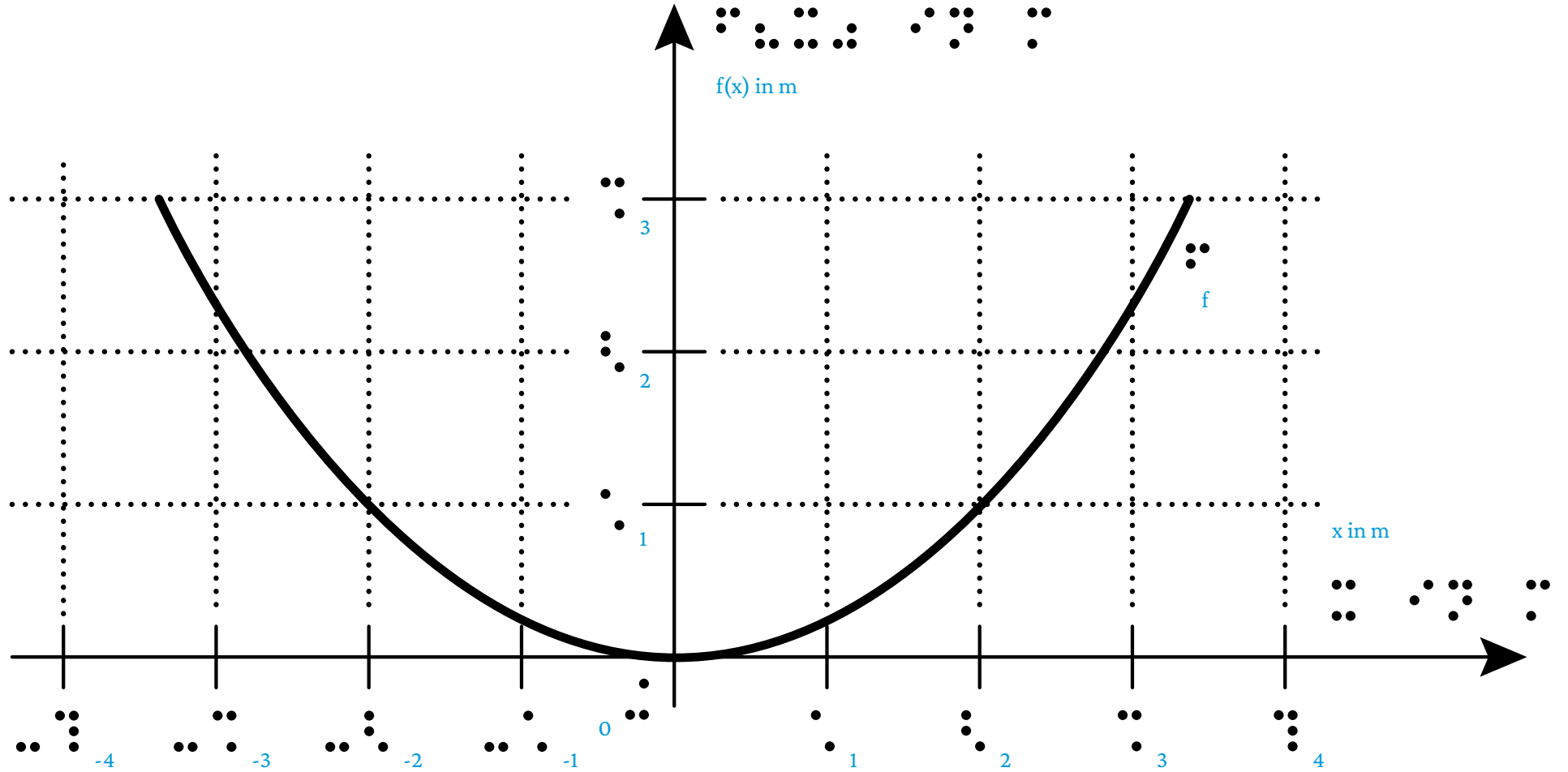
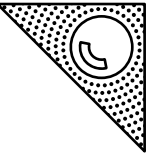
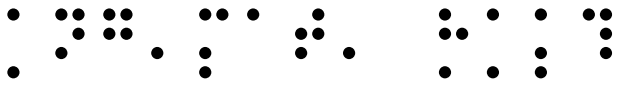
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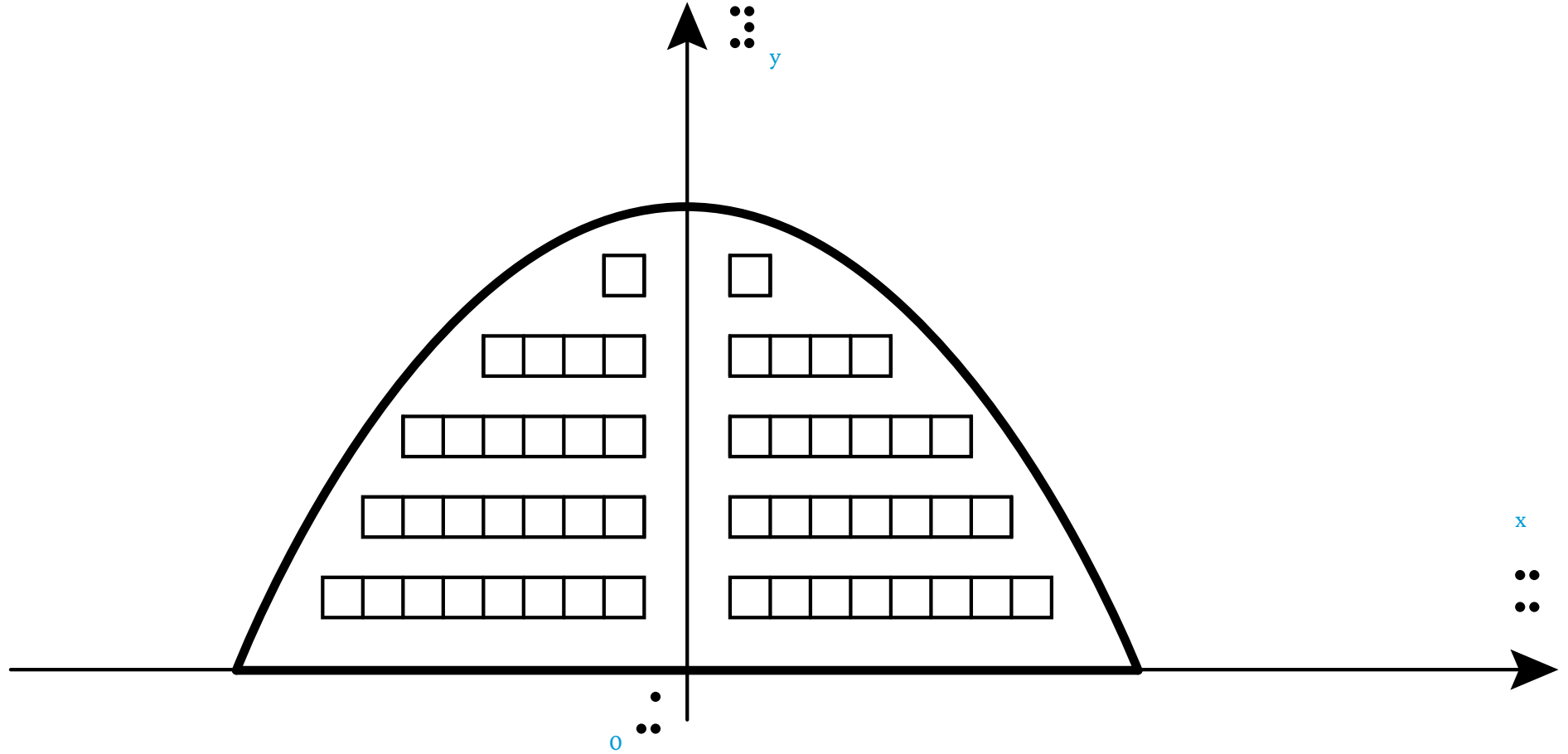
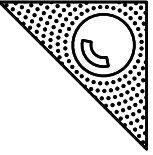
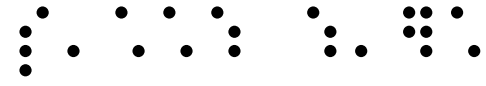
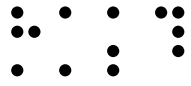
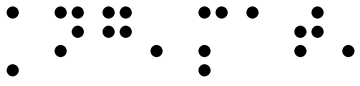


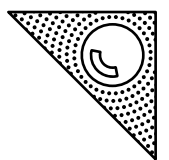






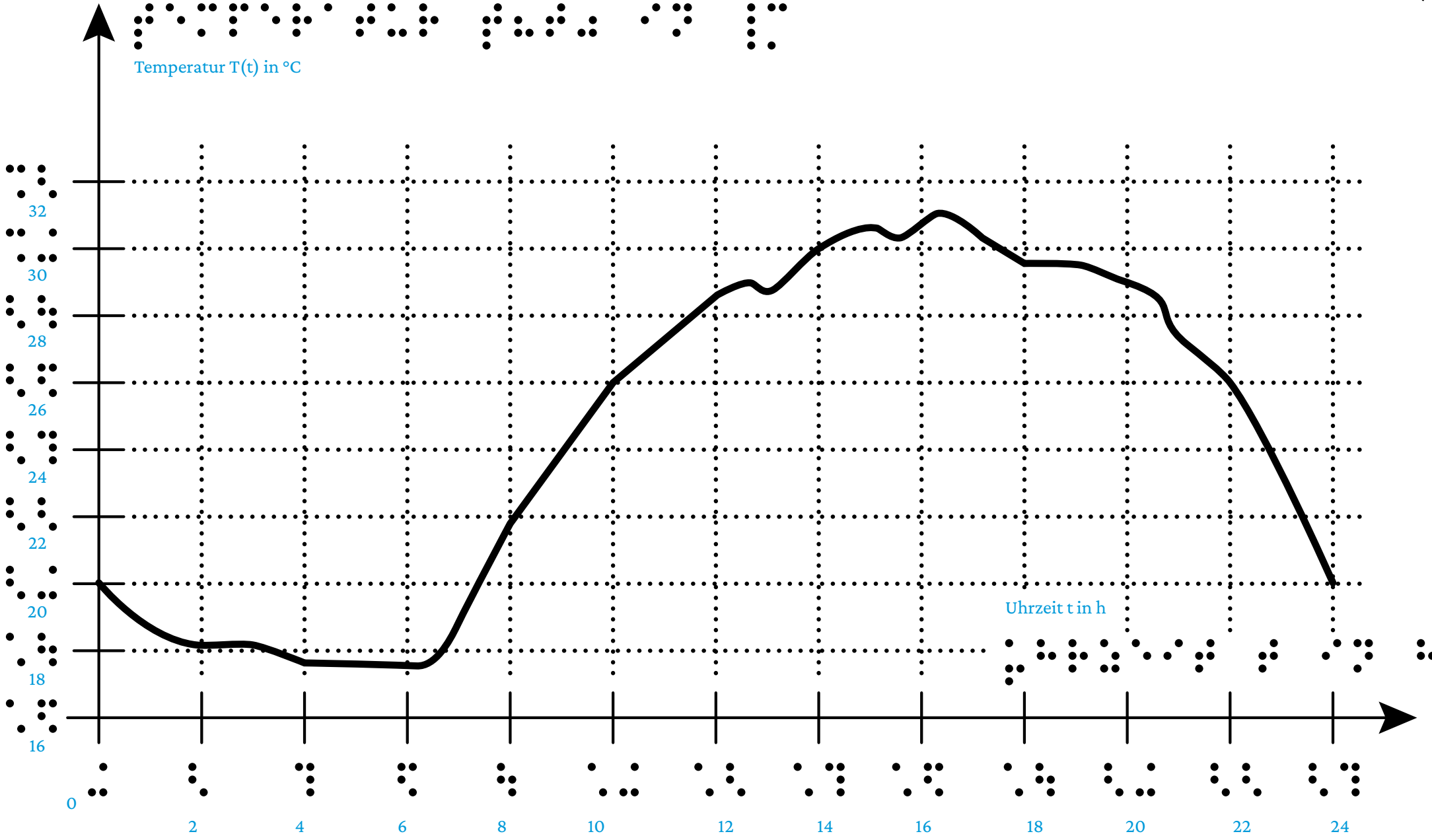


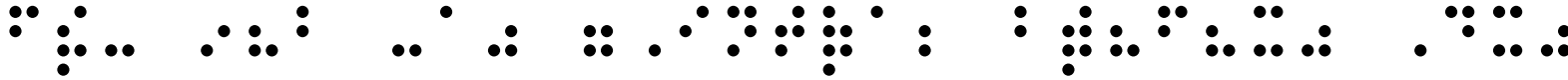
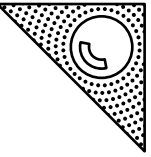
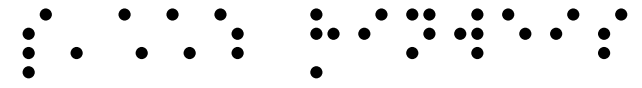
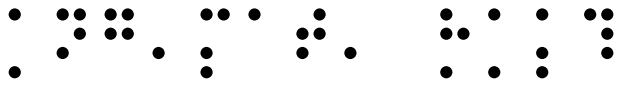




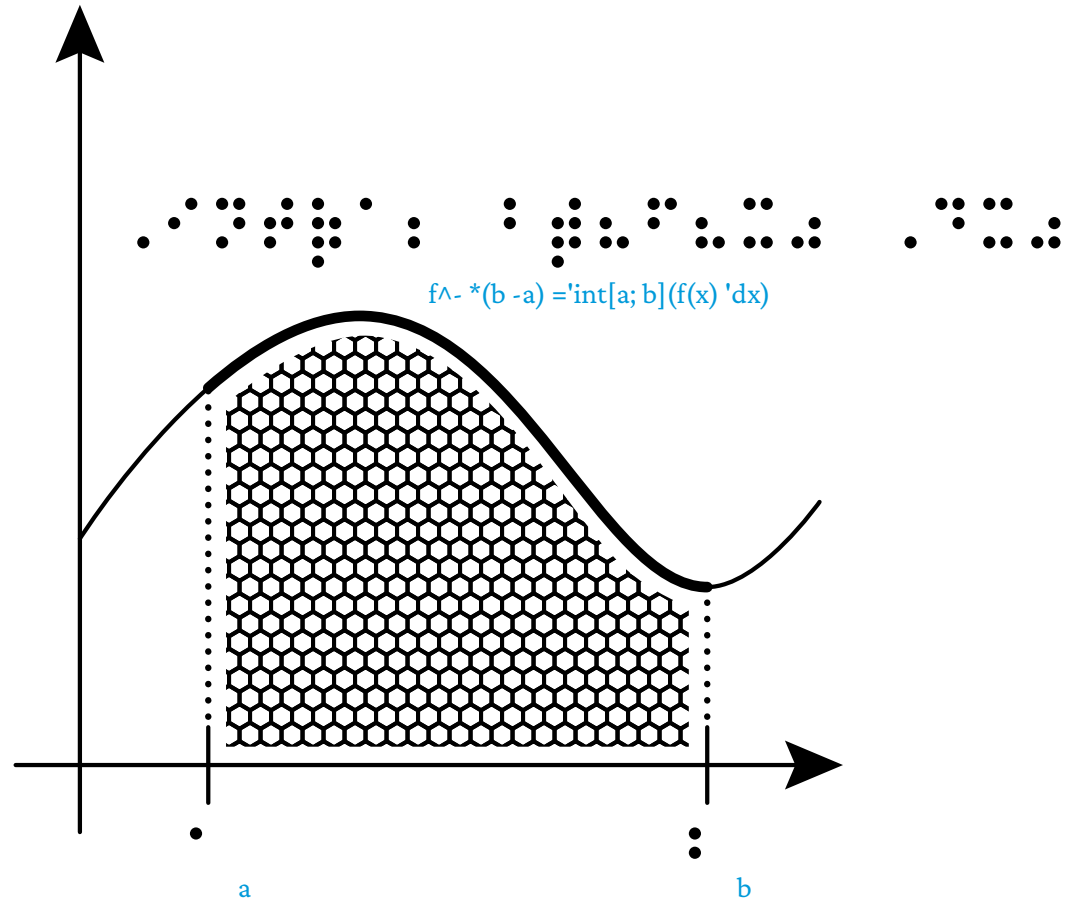
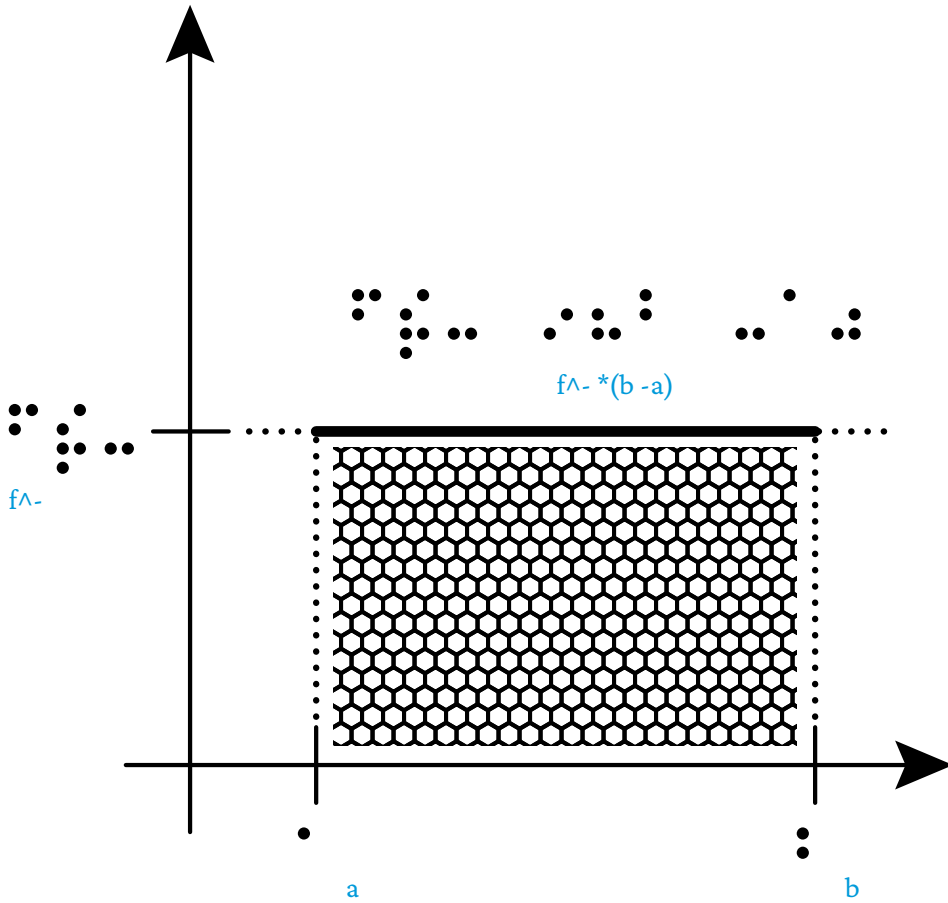
Temperatur $T(t)$ in $^{\circ}\text{C}$

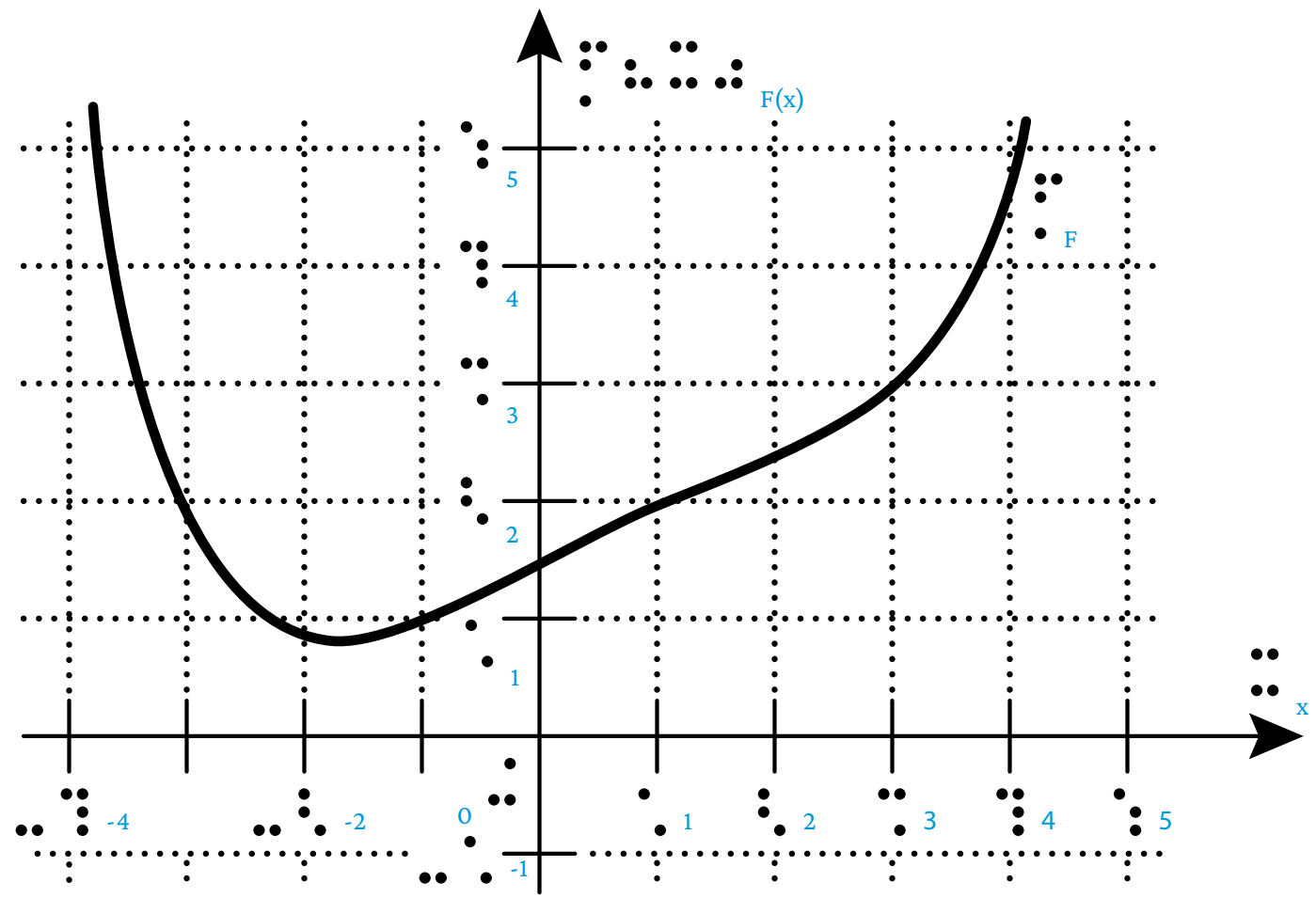
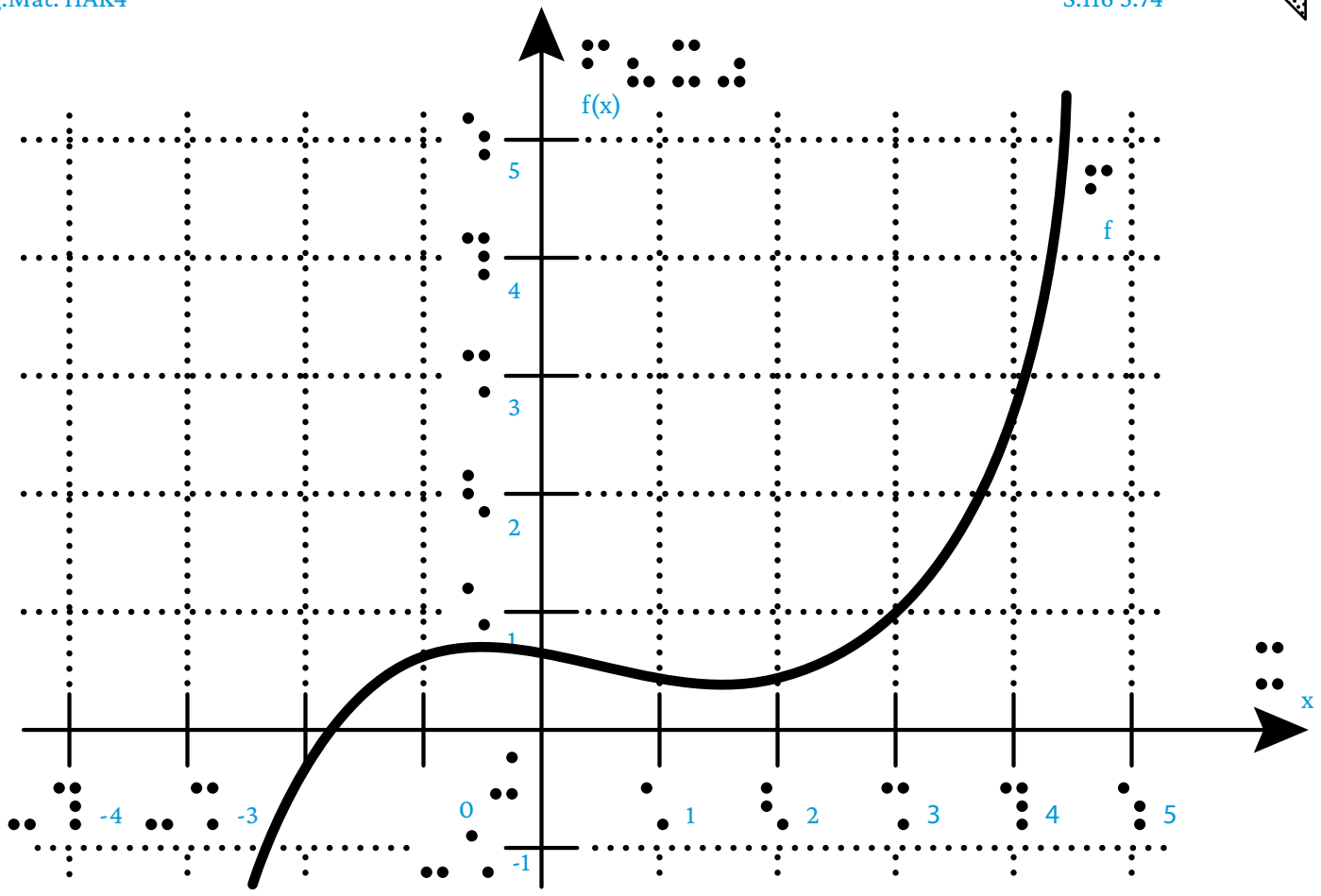
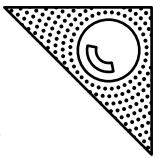
Uhrzeit t in h

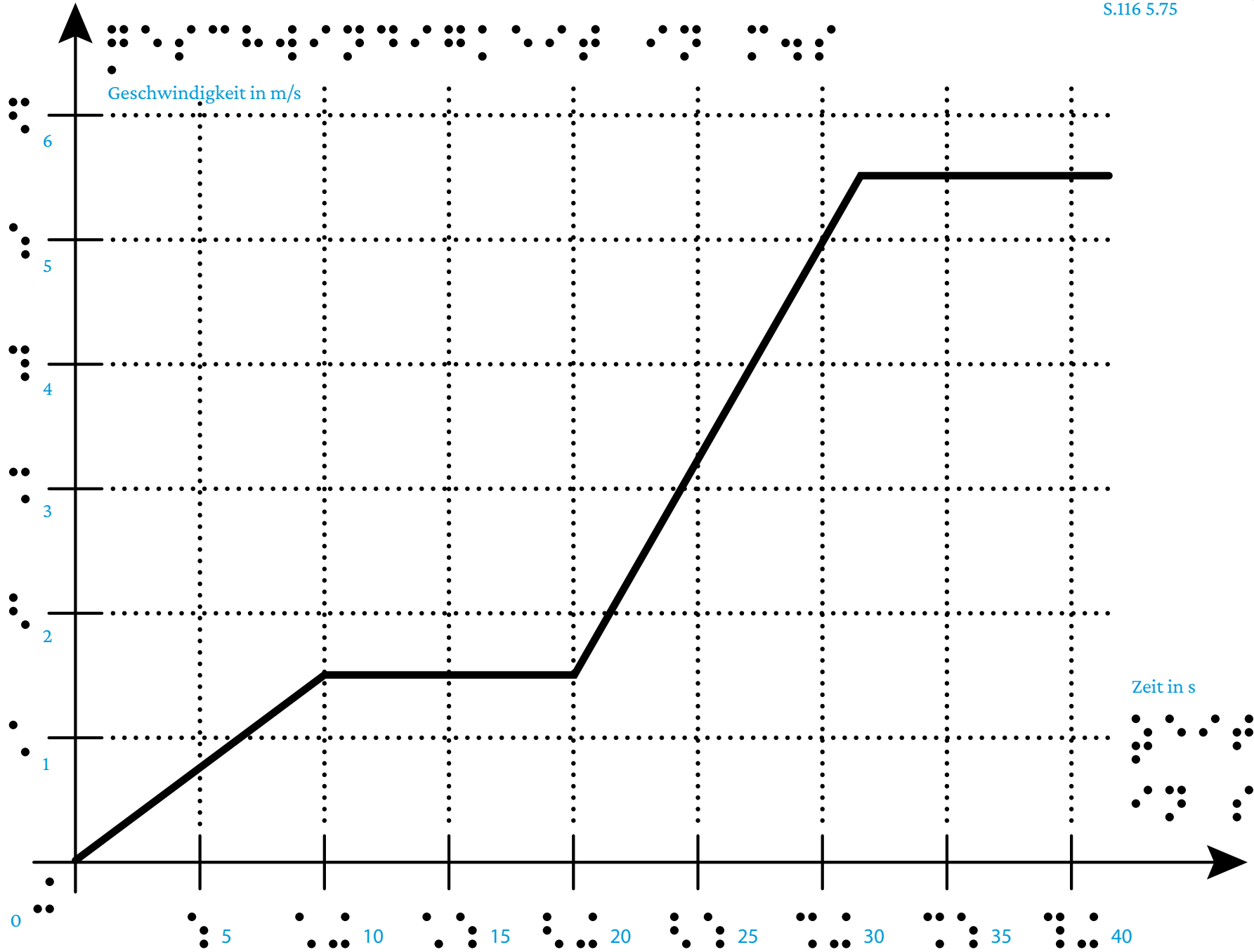
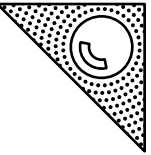


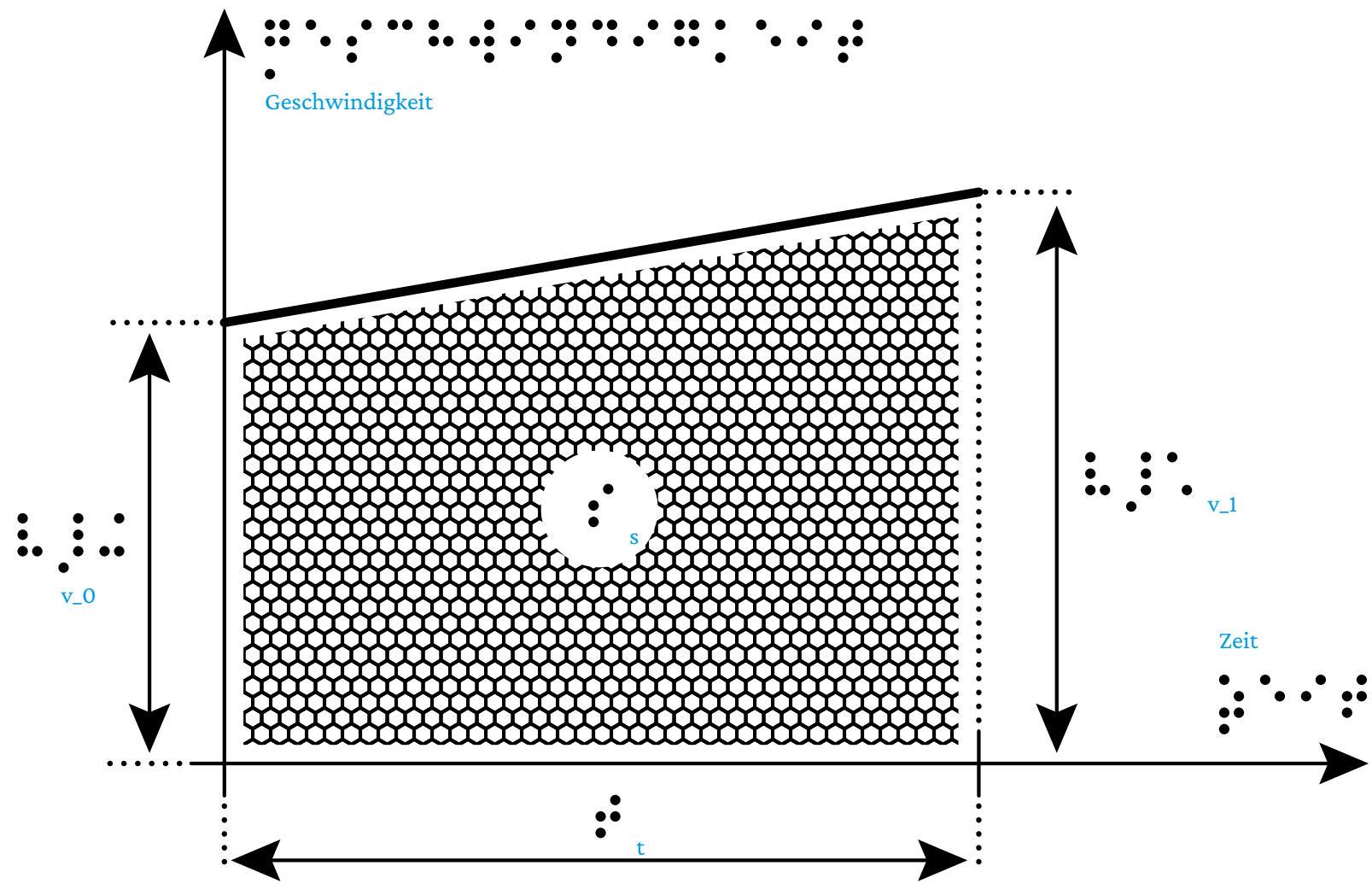
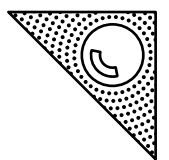
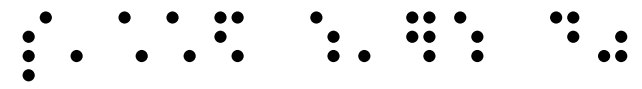
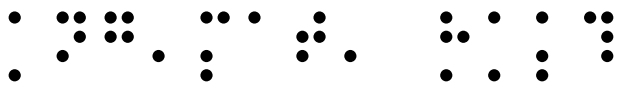


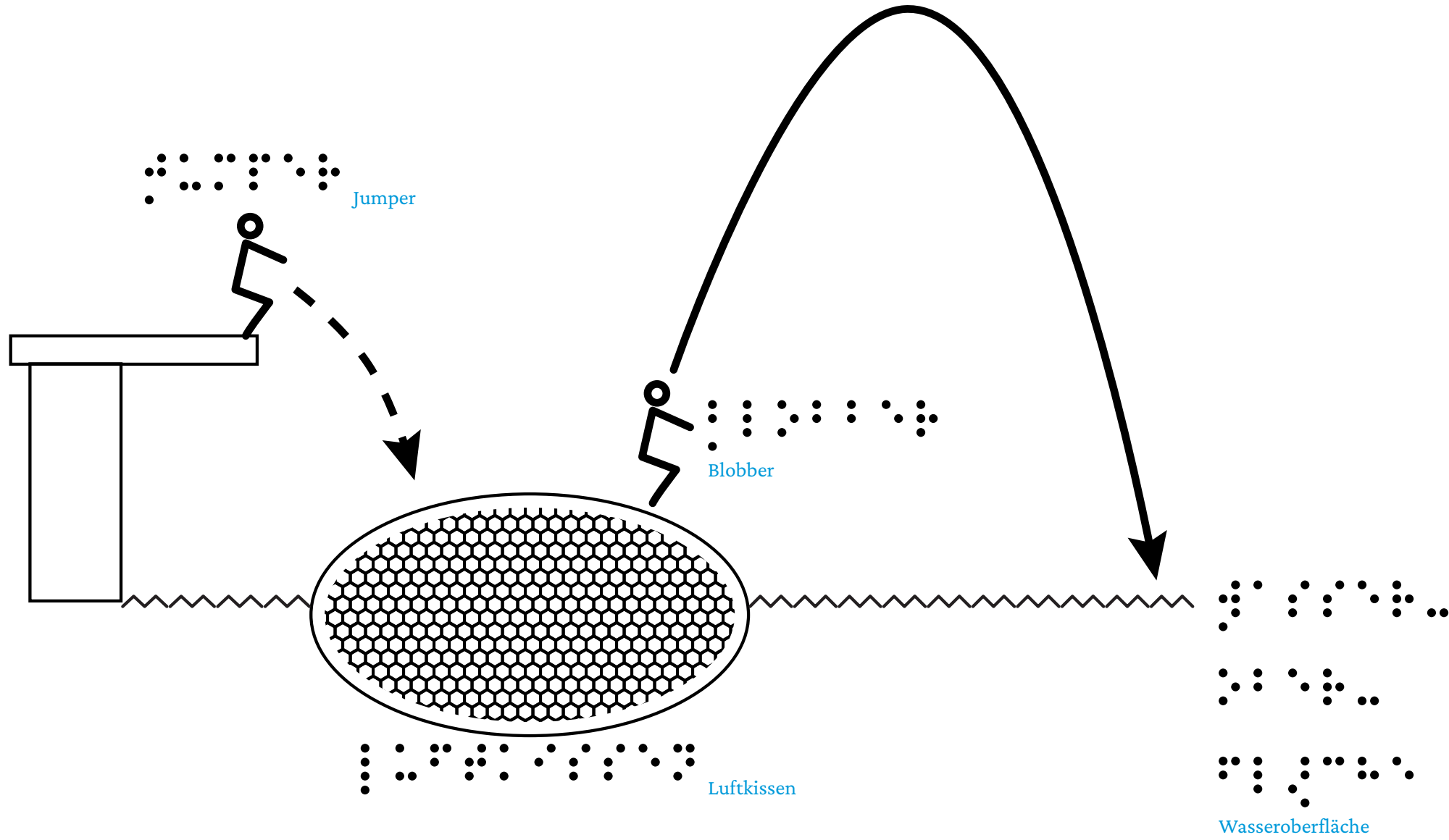
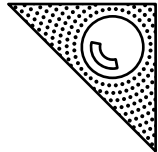
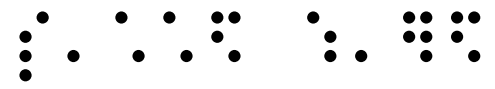
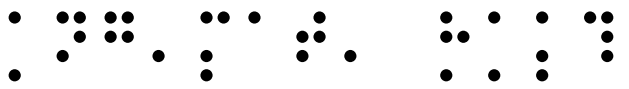
$$f(b-a) = \int_a^b f(x) dx$$

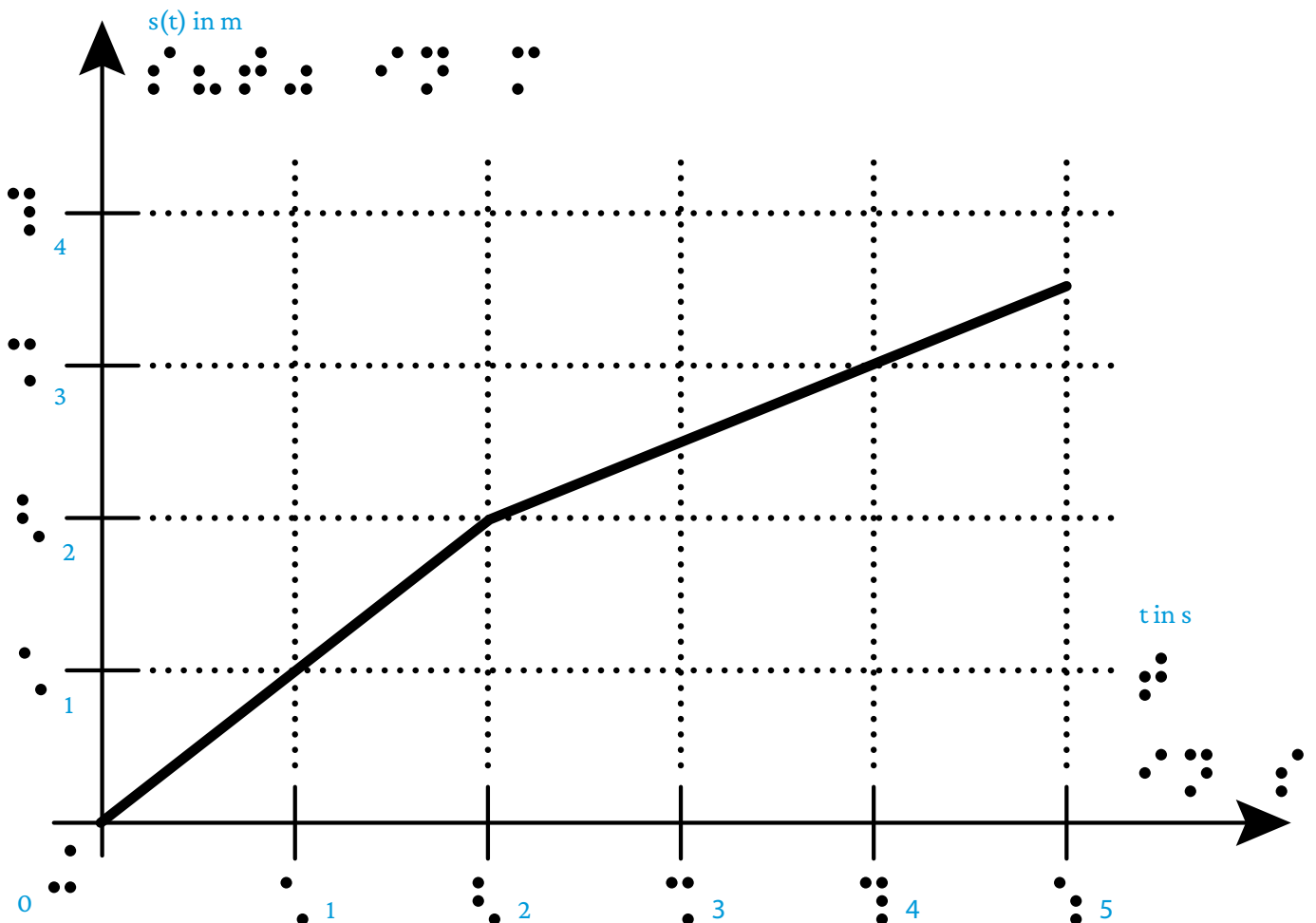
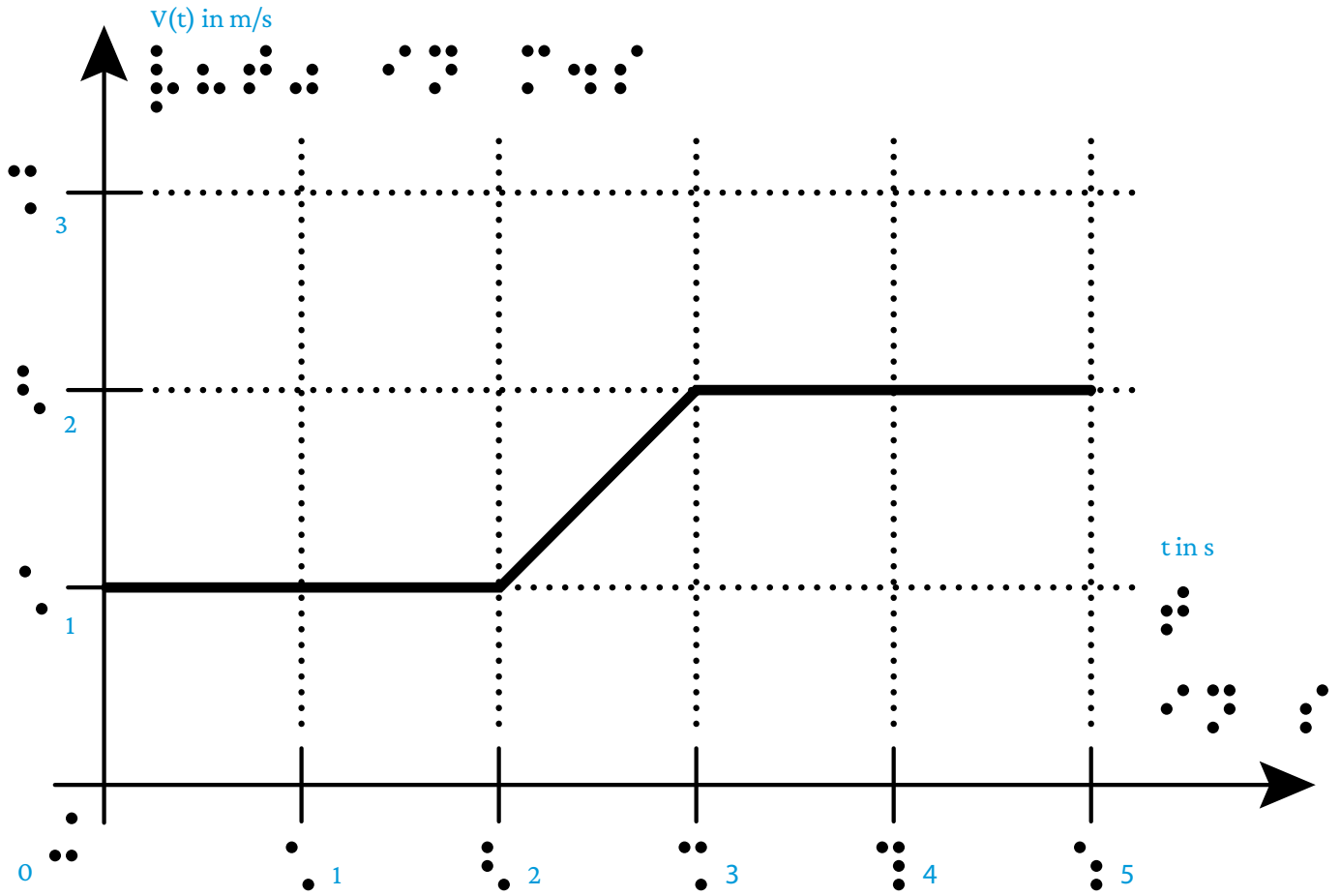
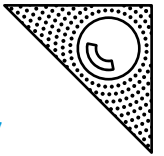


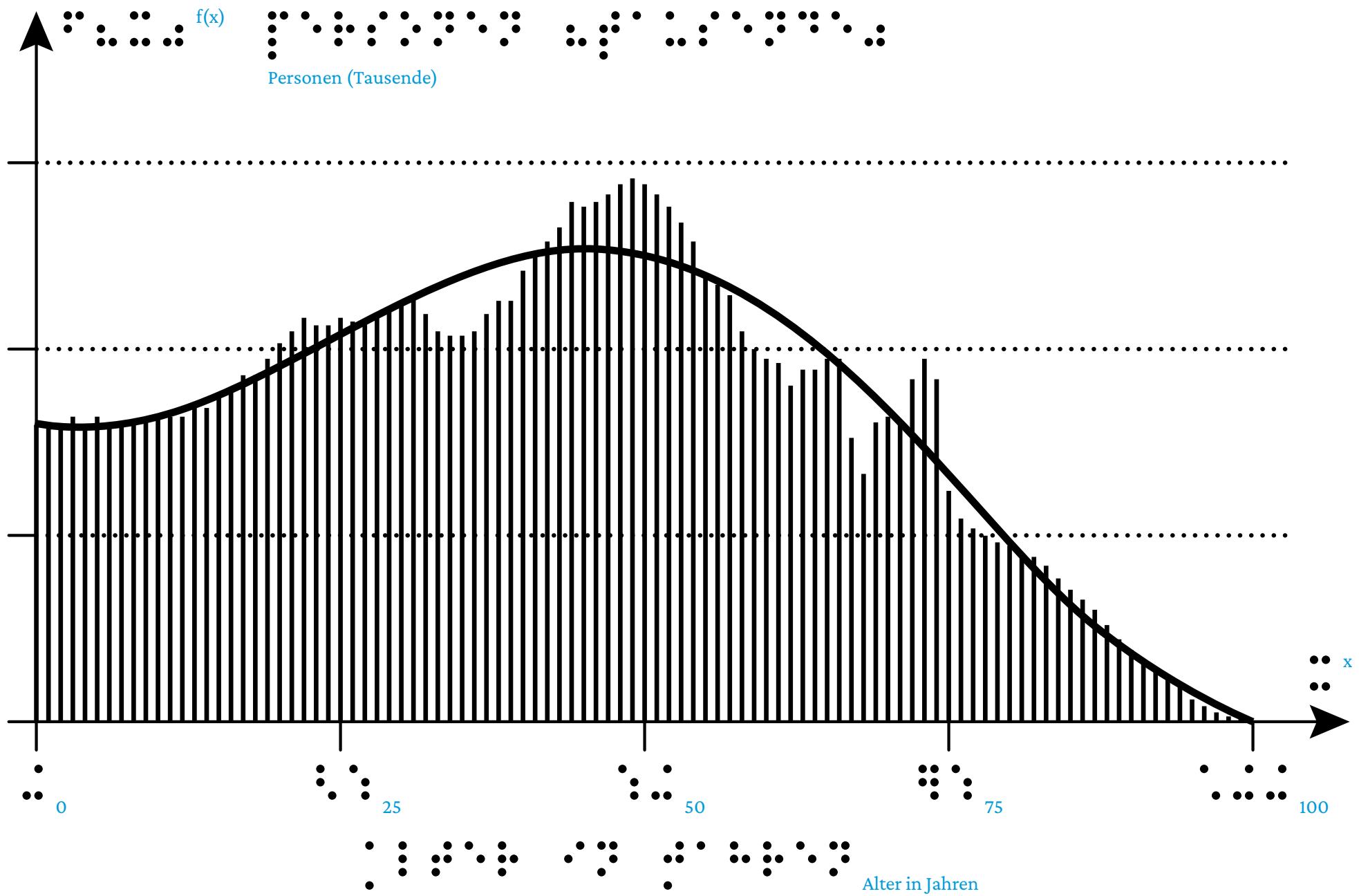
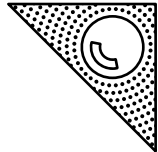
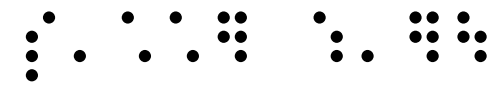
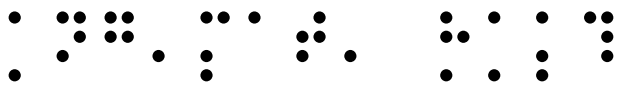


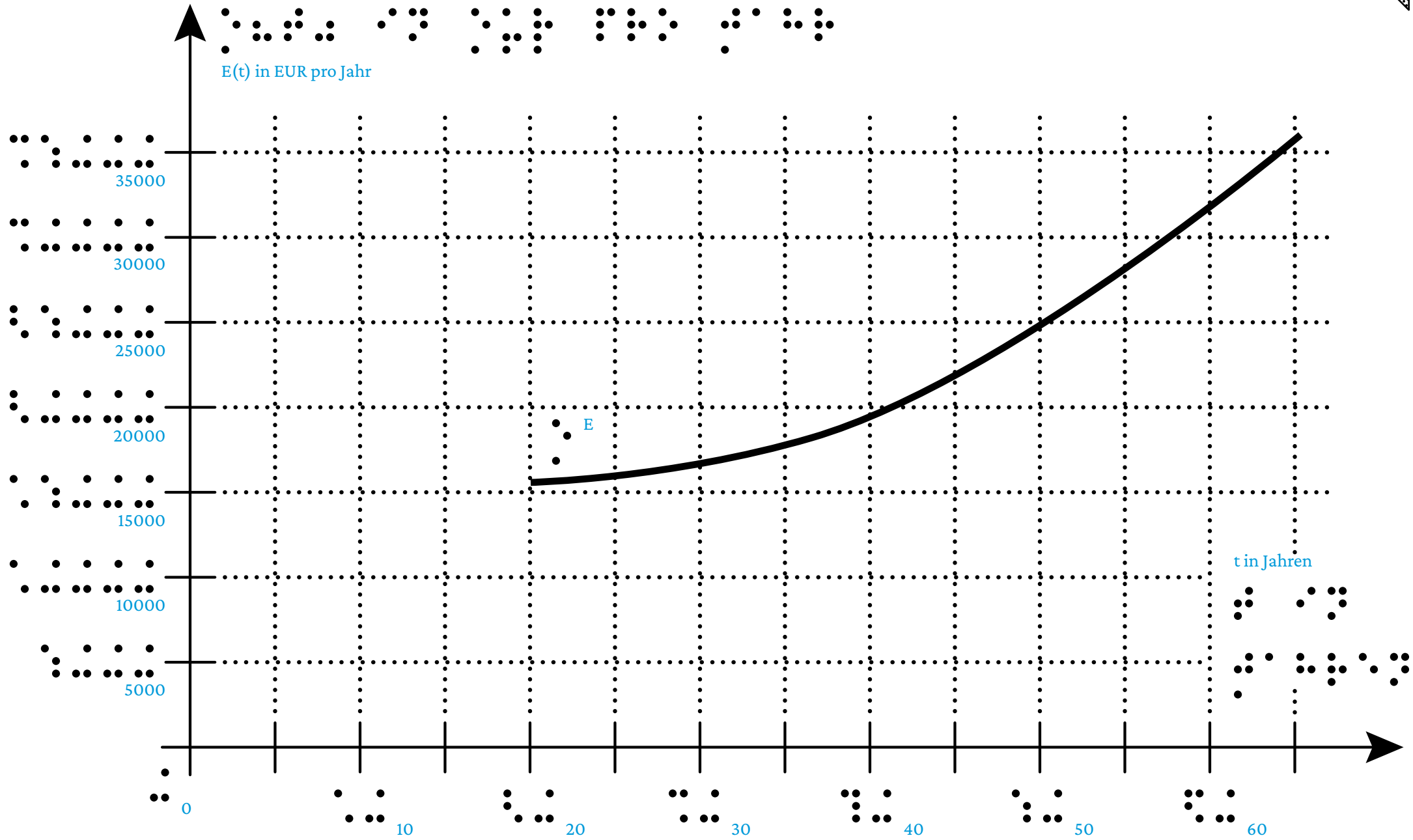
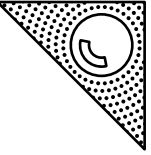


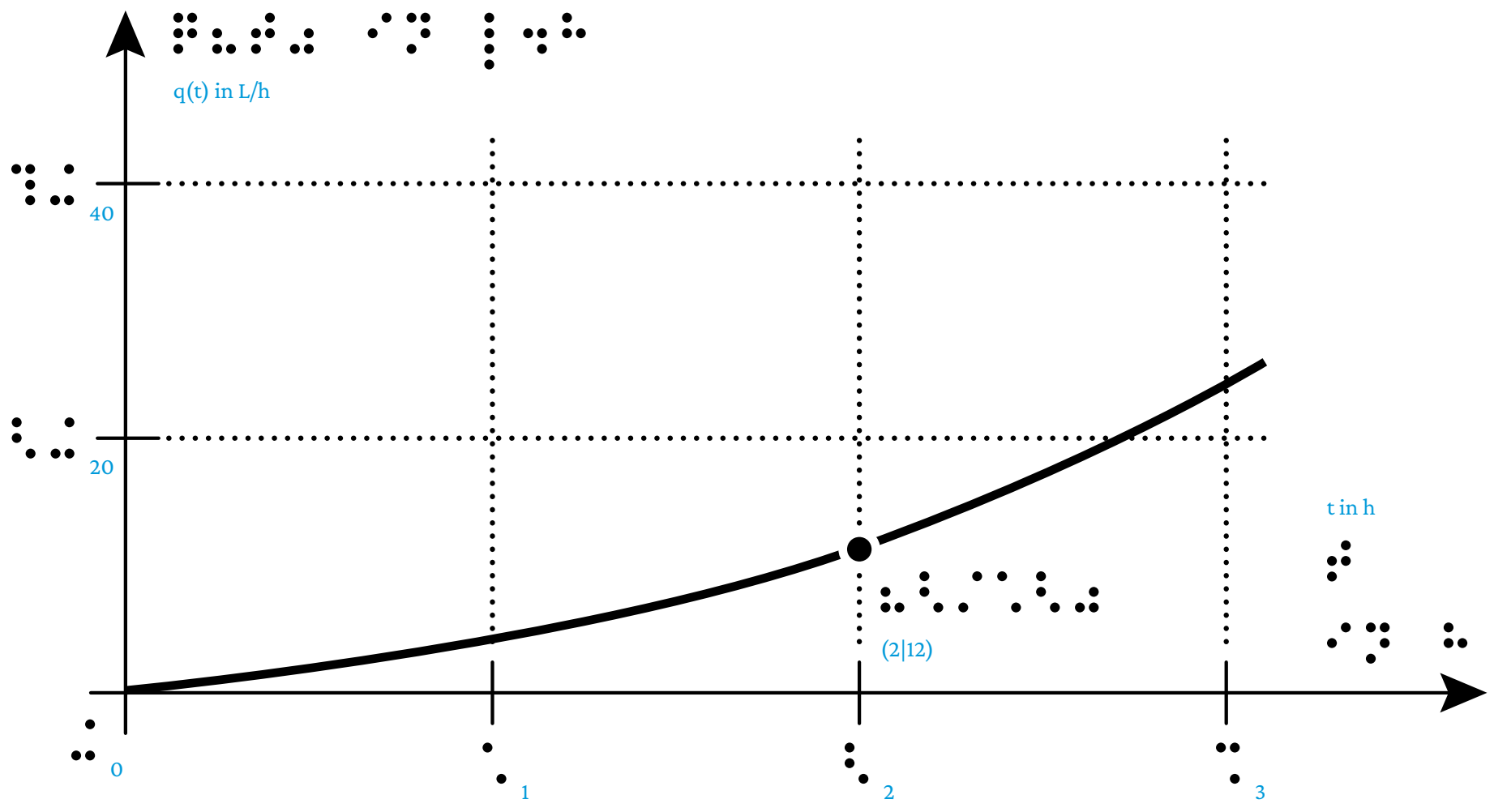
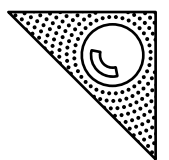


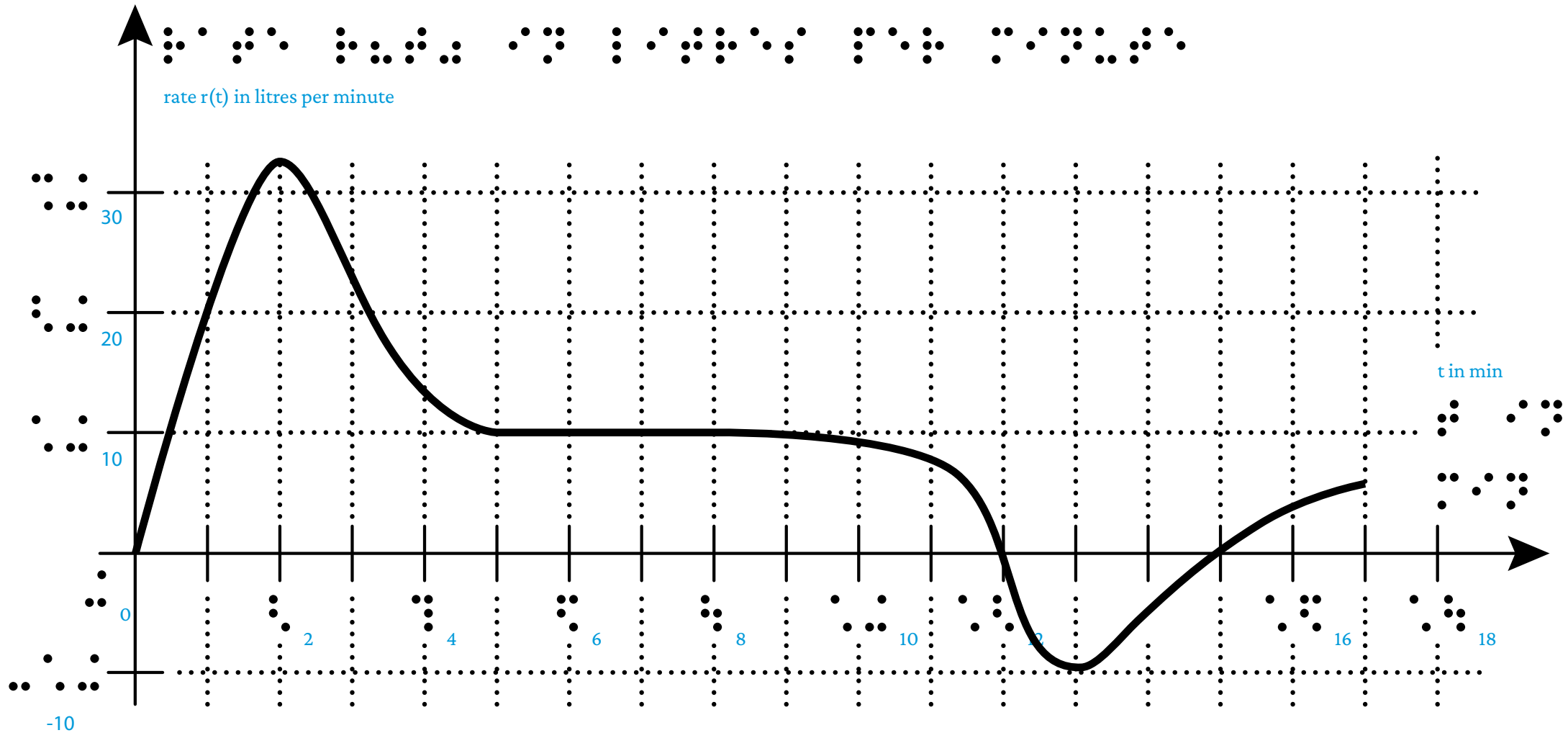
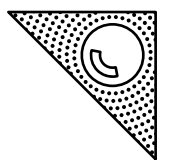
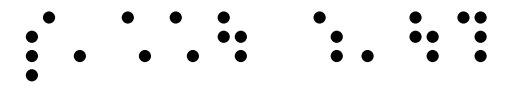
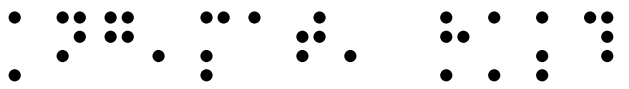


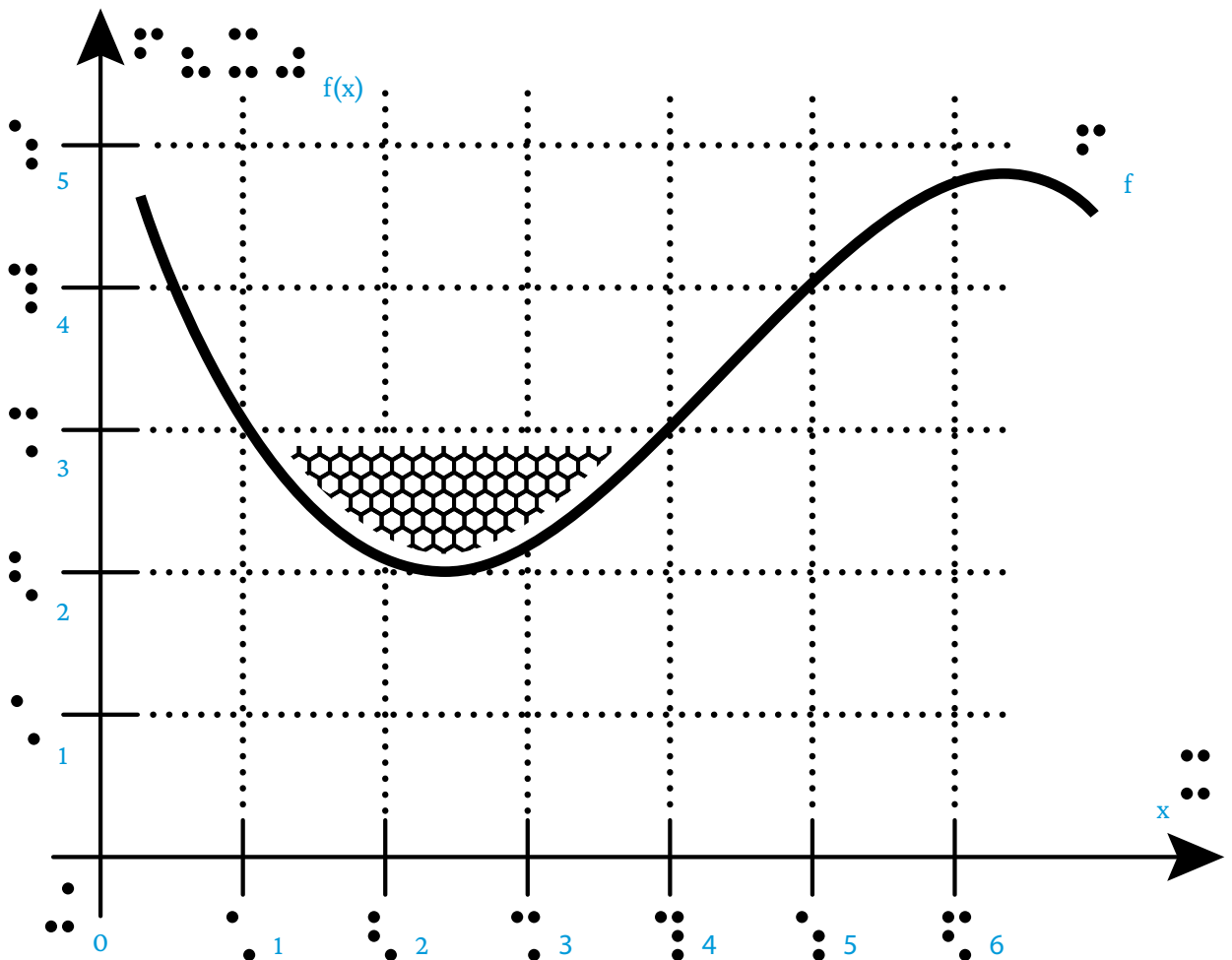
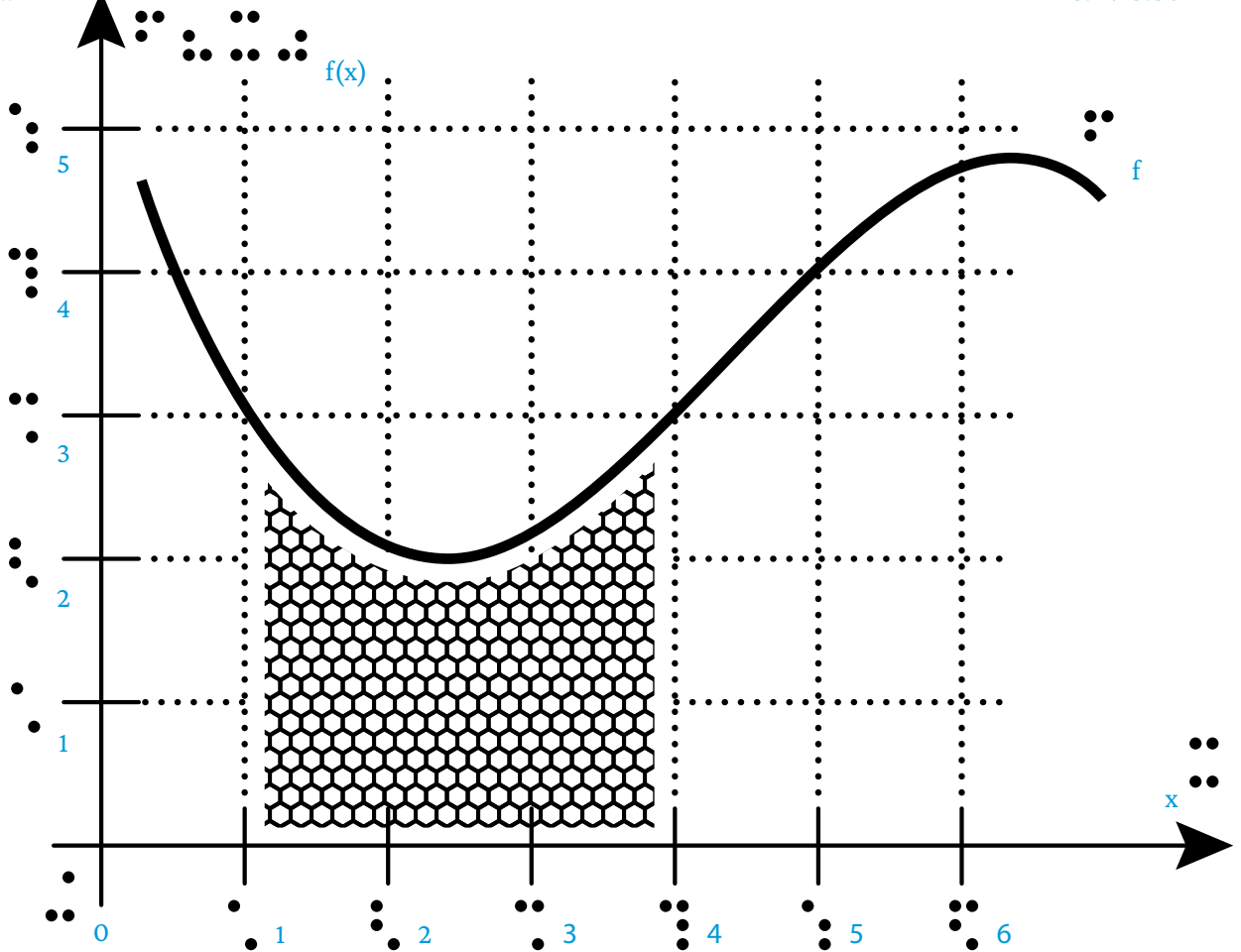
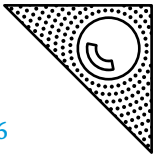


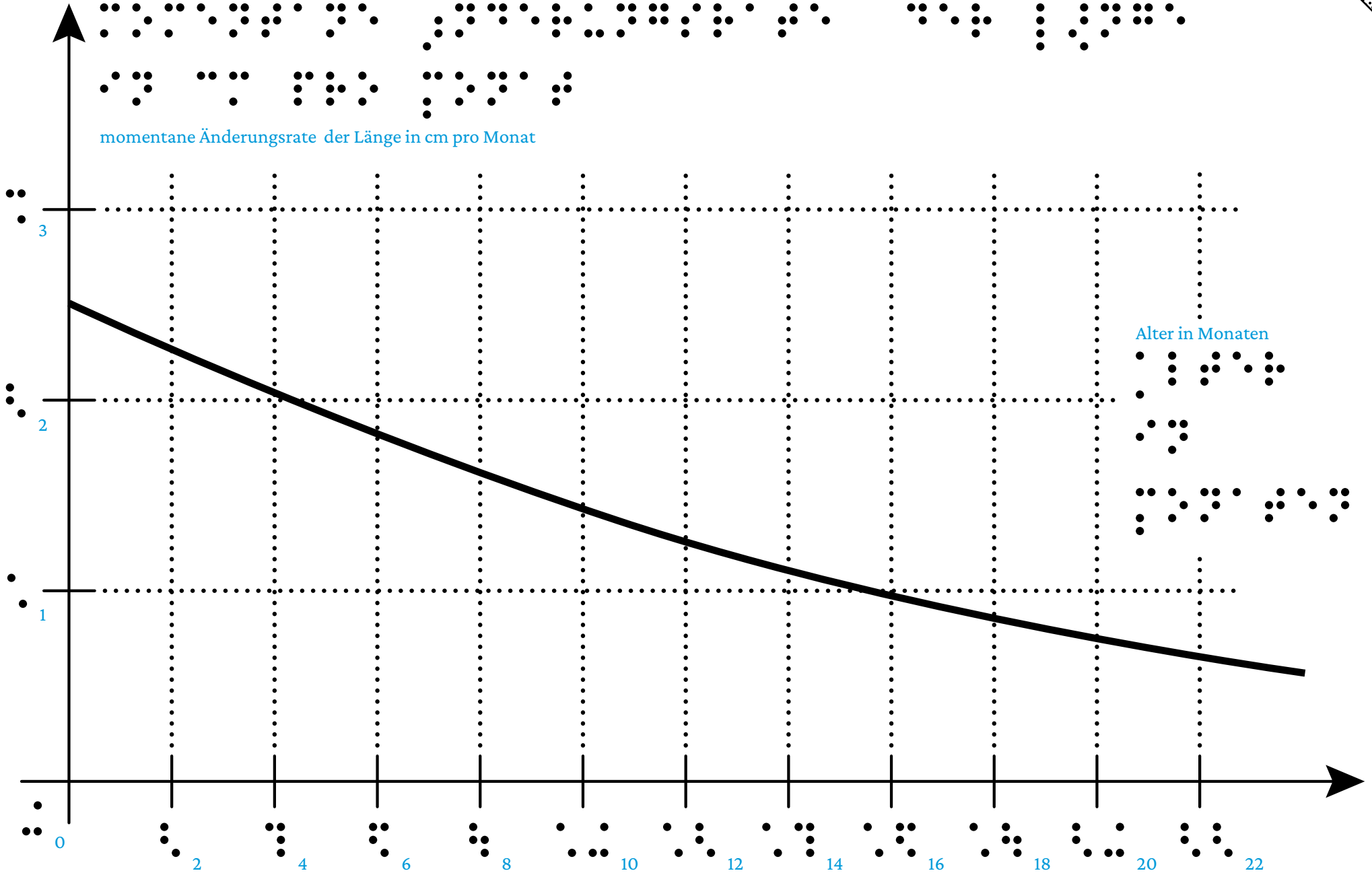
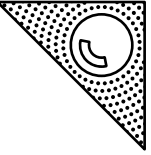


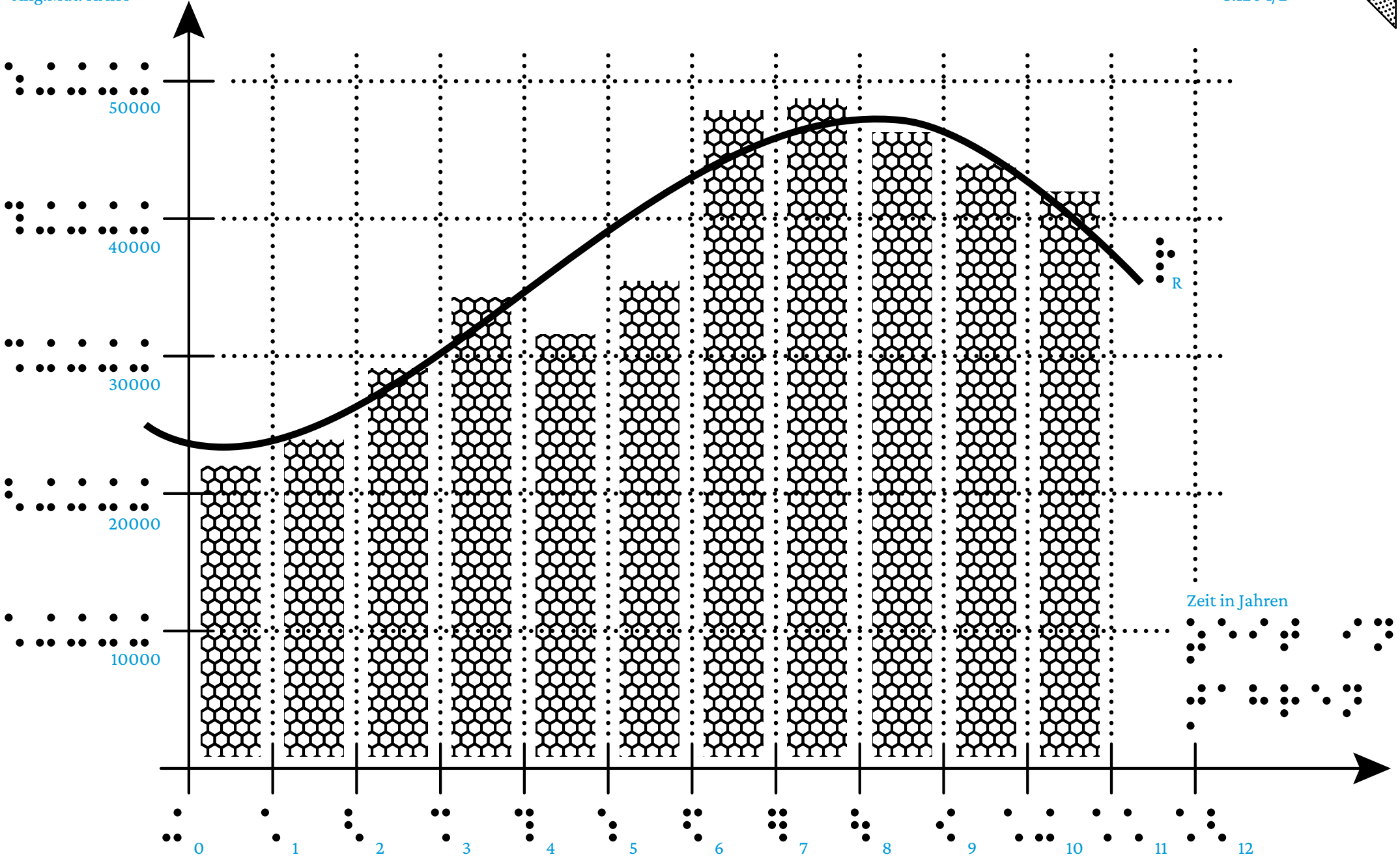
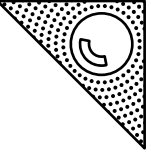


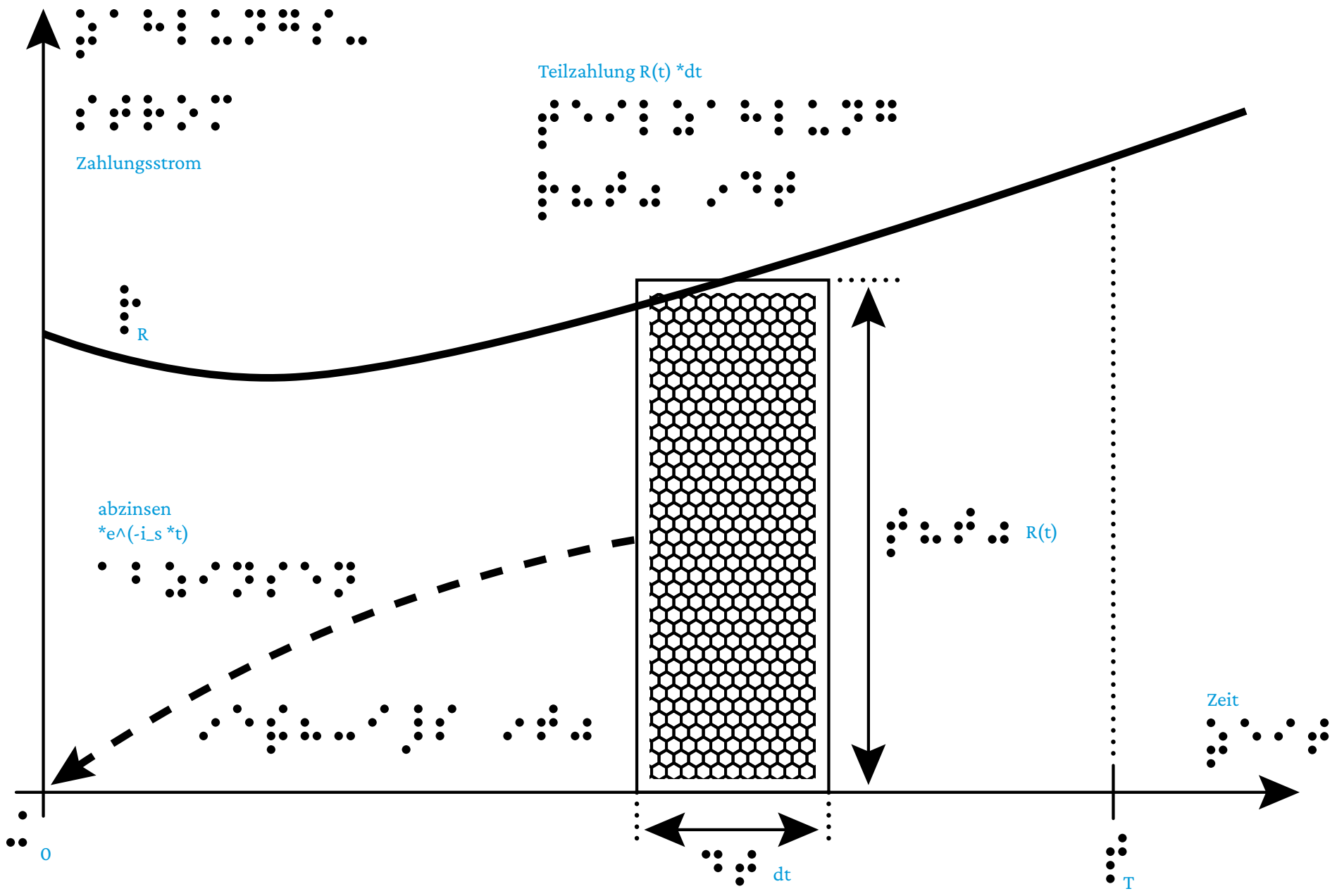


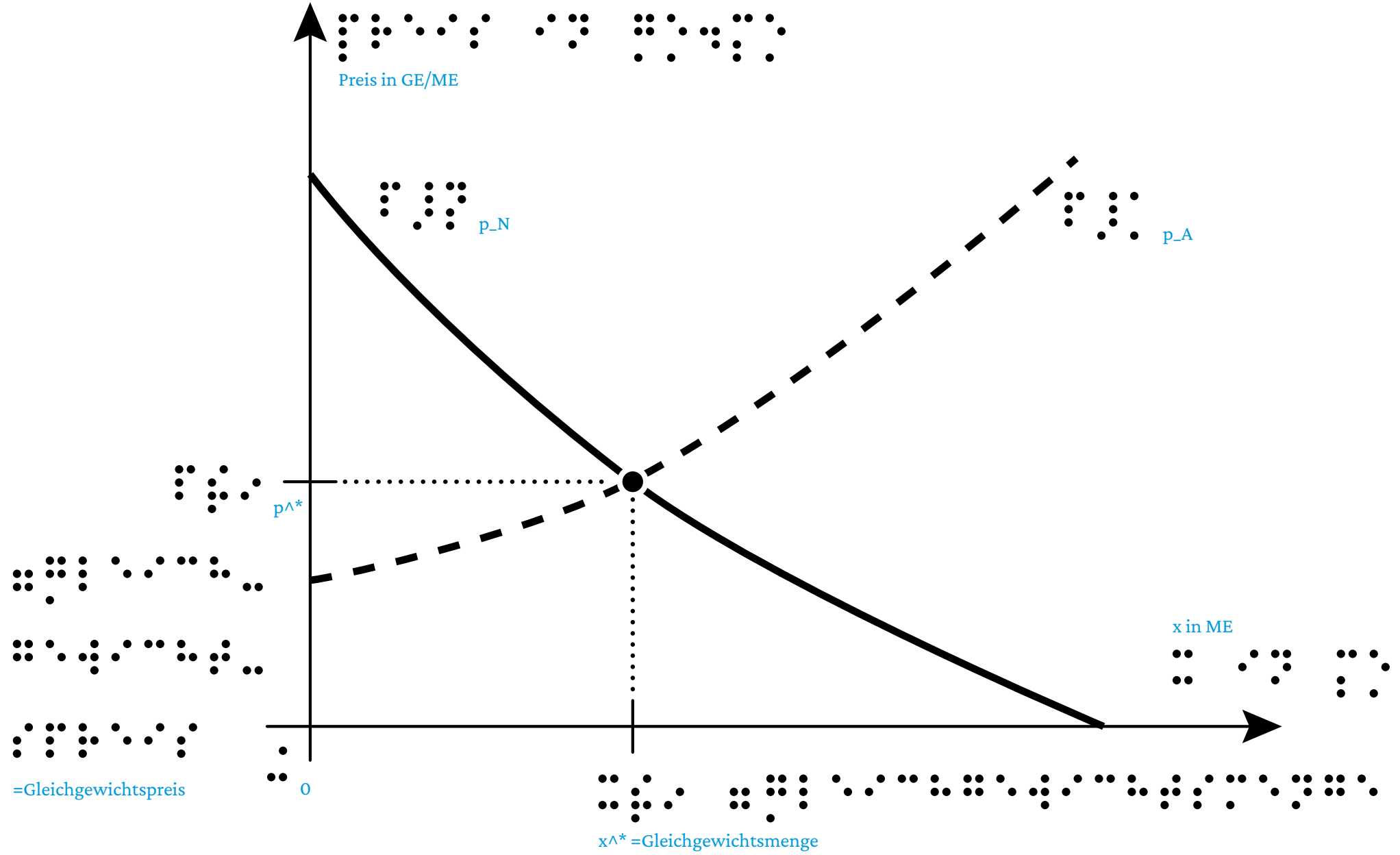
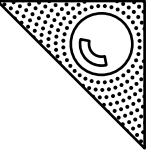


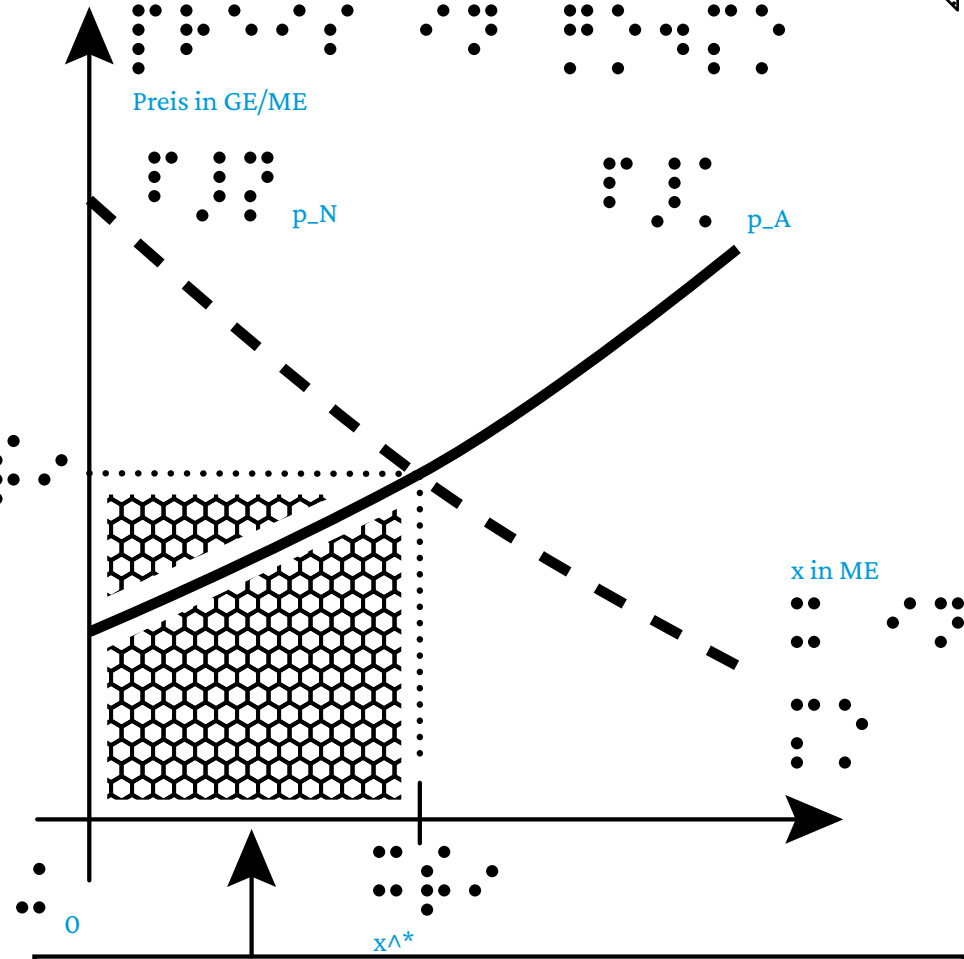
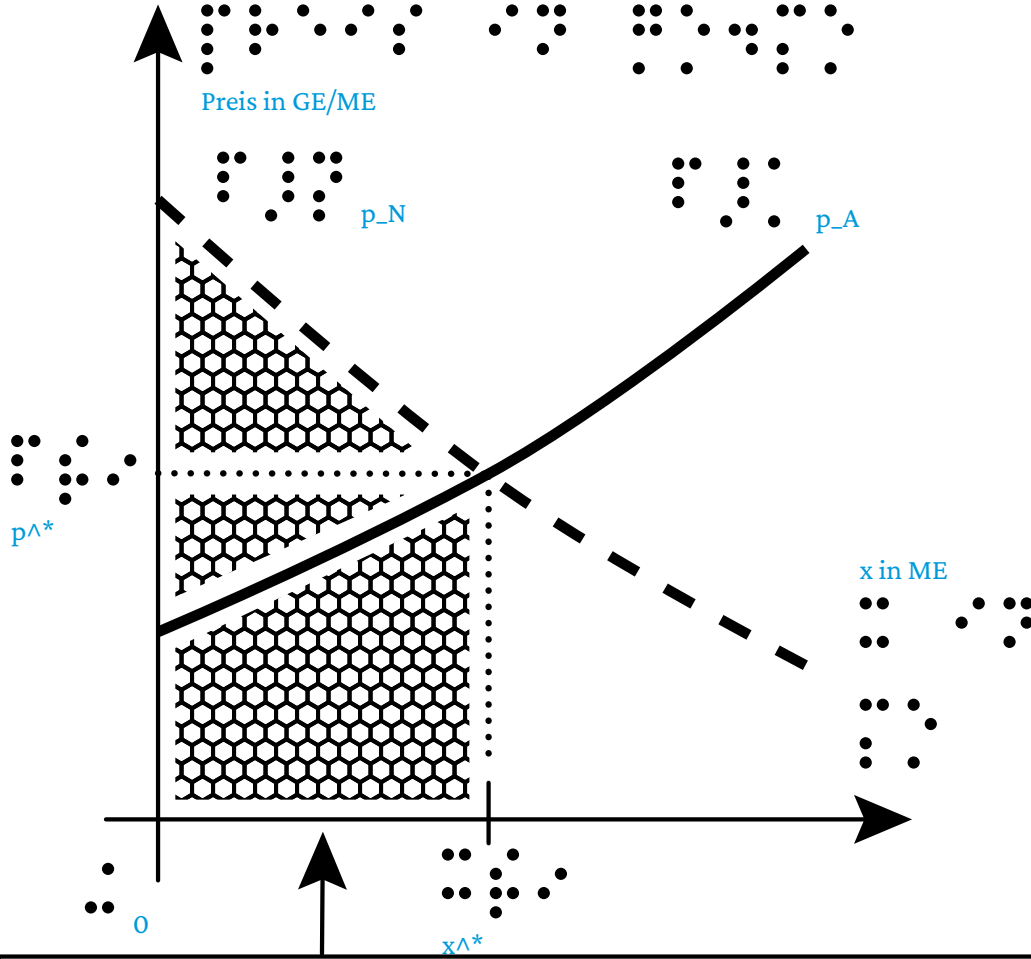
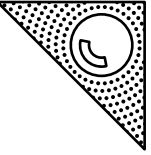






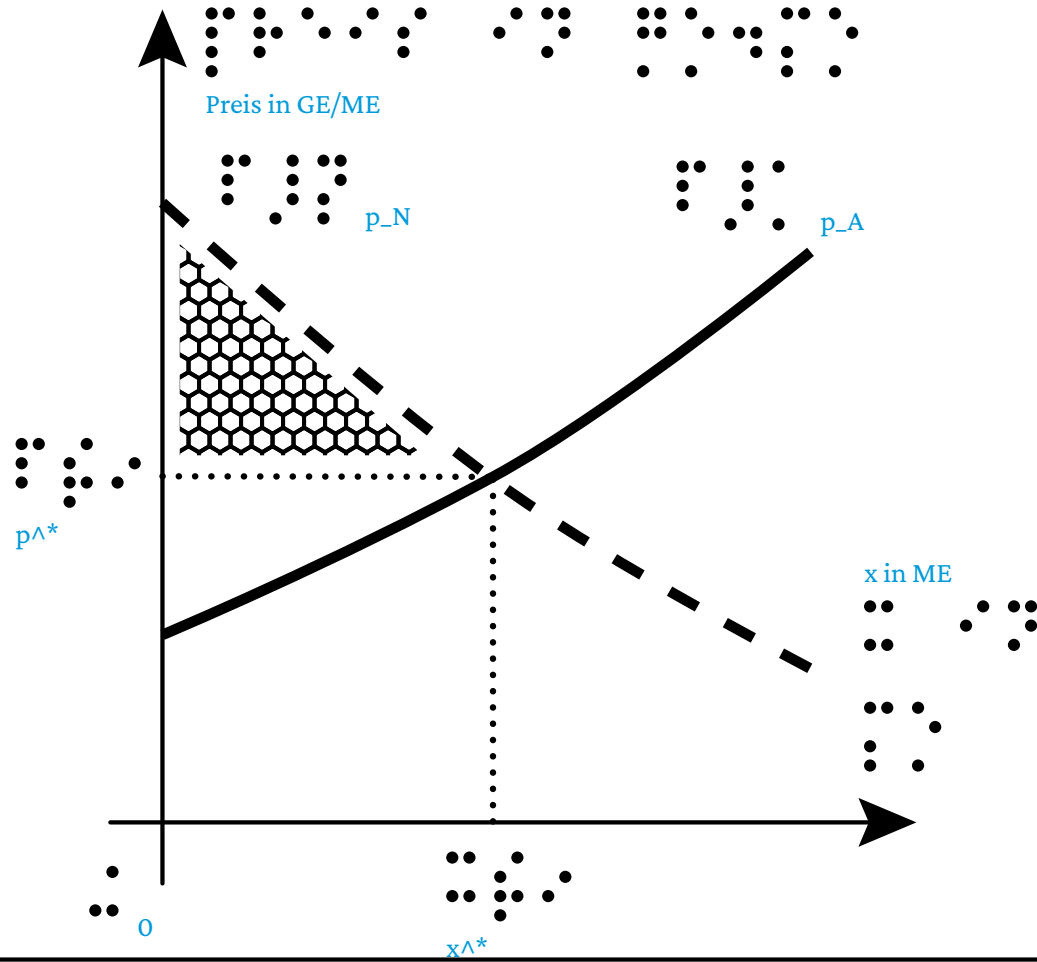
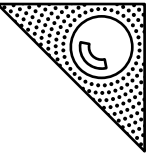




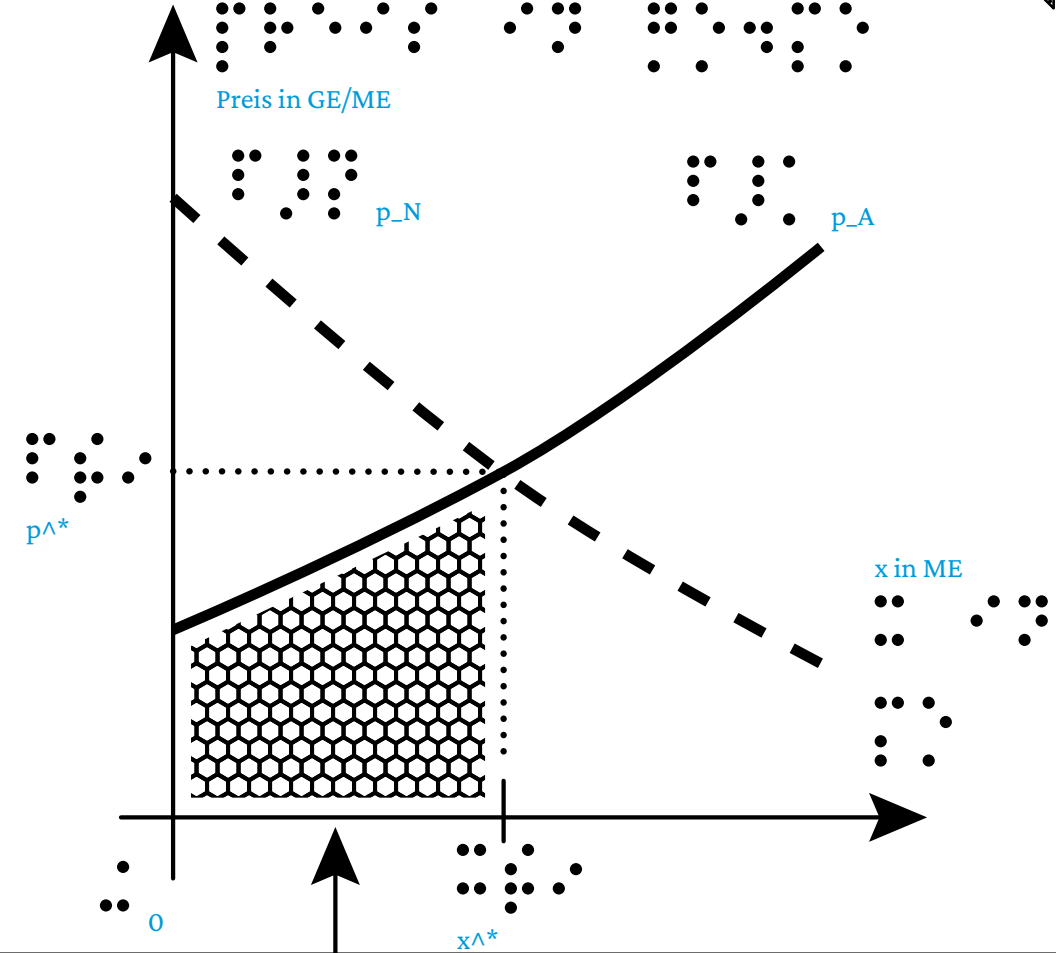
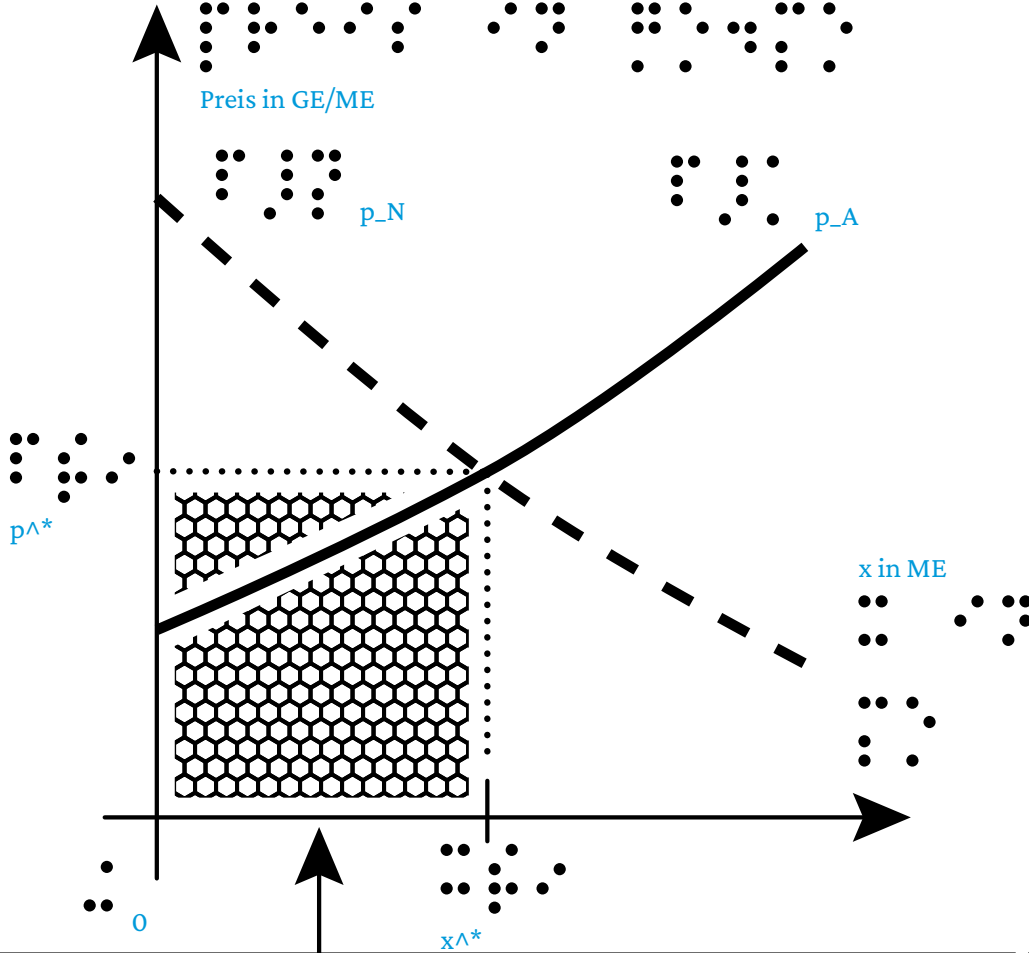
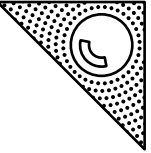


Konsumenten sind bereit $\int_0^{x^*} (p_N(x) \cdot dx)$ zu zahlen

Tatsächlich zahlen sie aber nur $p^* \cdot x^*$

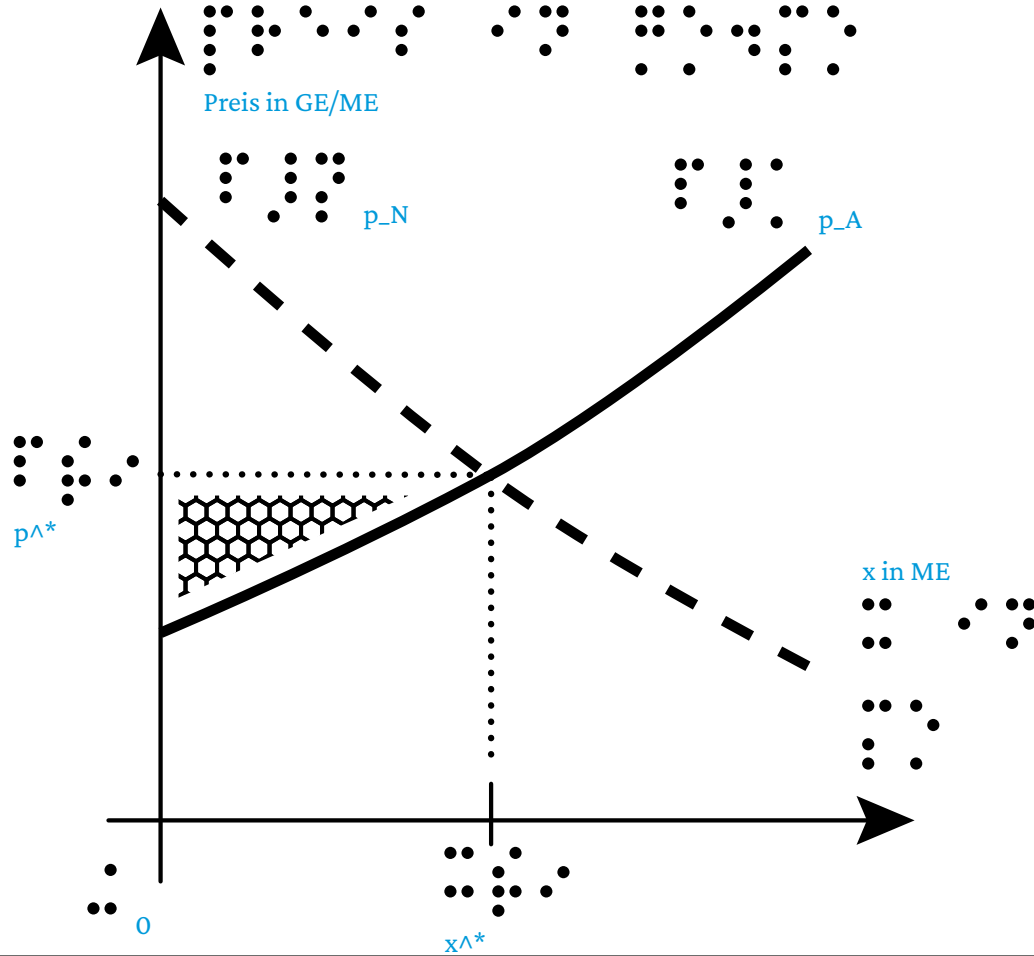
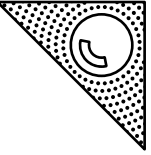


Konsumenten sparen also: $\int_0^{x^*} (p_N(x) - p^*) dx$. Das nennt man Konsumentenrente

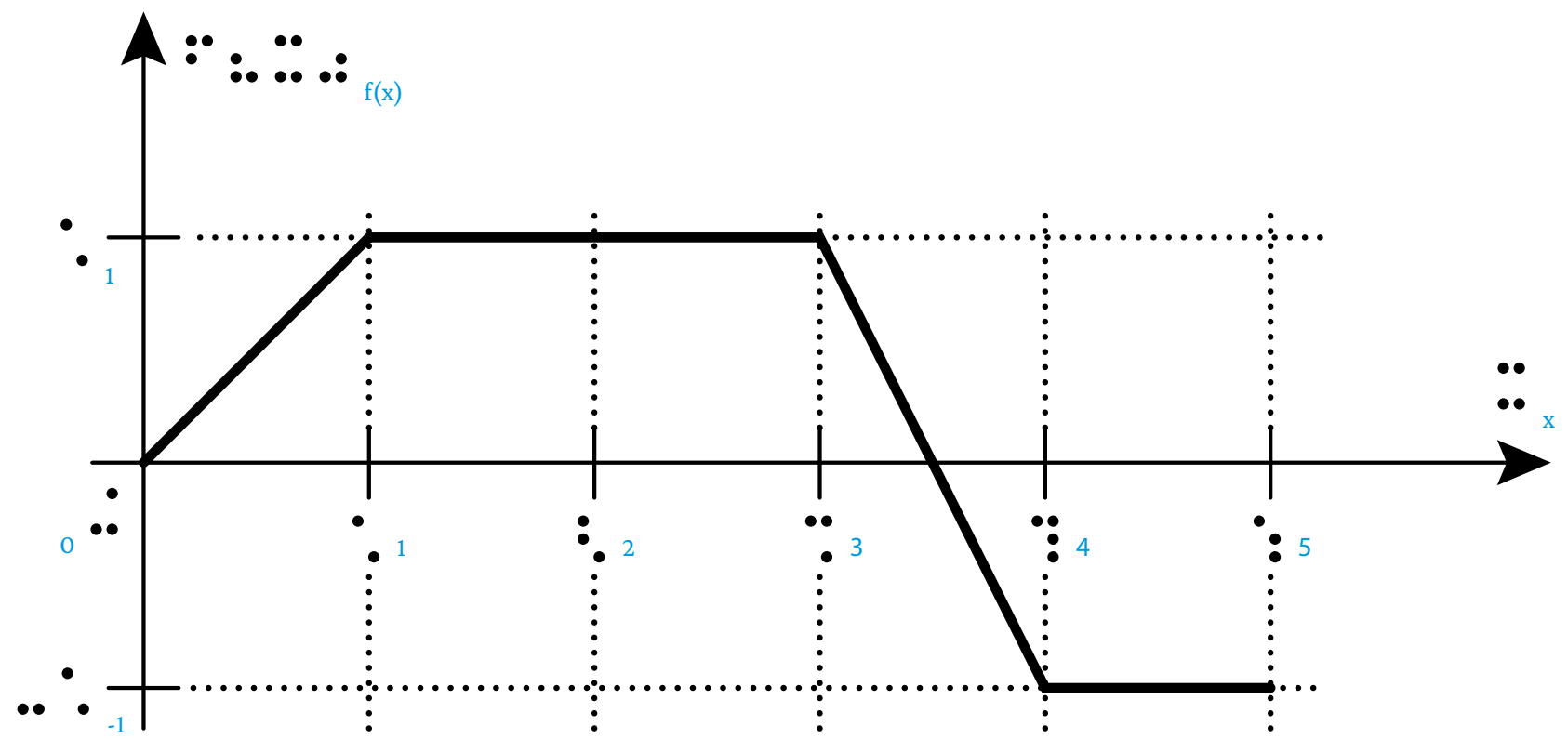
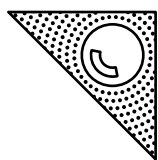
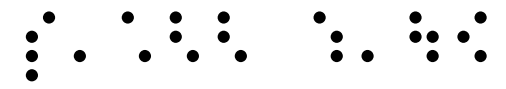
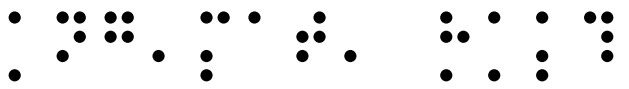


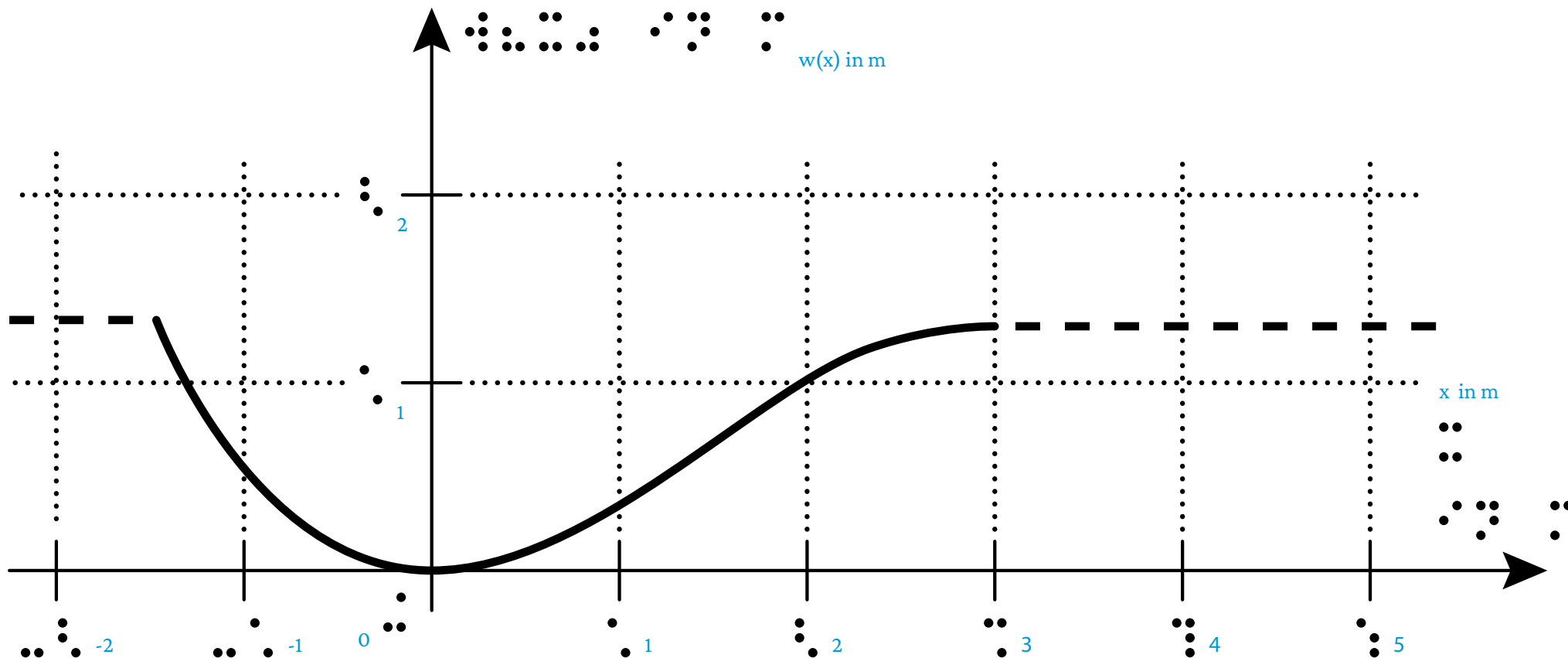
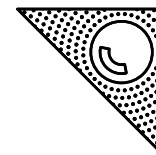
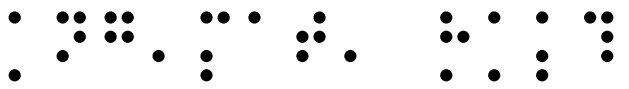
Produzenten erzielen einen Erlös von $p^* \cdot x^*$

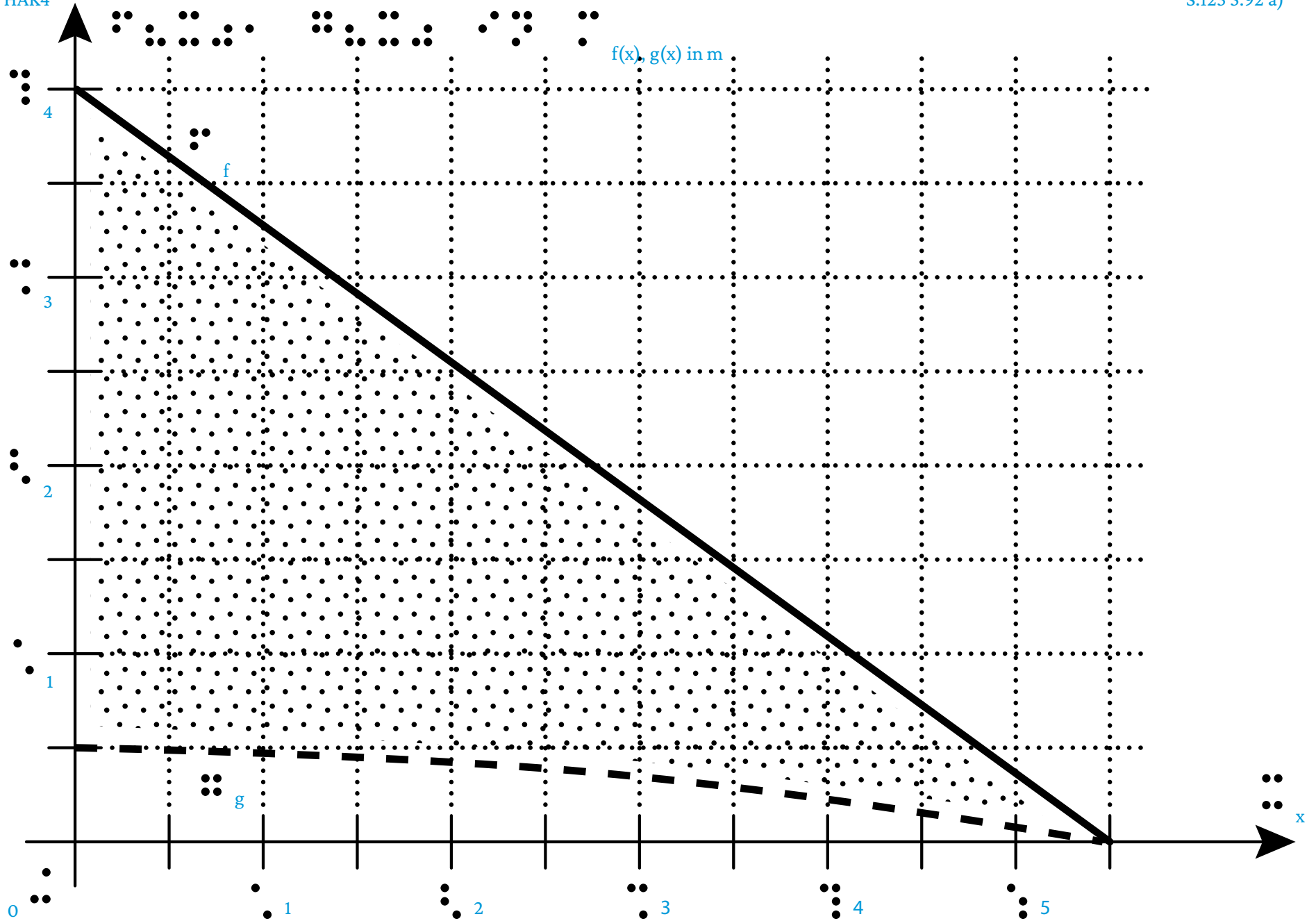
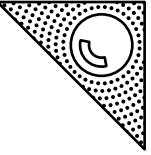
Würden aber Erlös von $\int_0^{x^*} (p_N(x) \cdot dx)$ akzeptieren

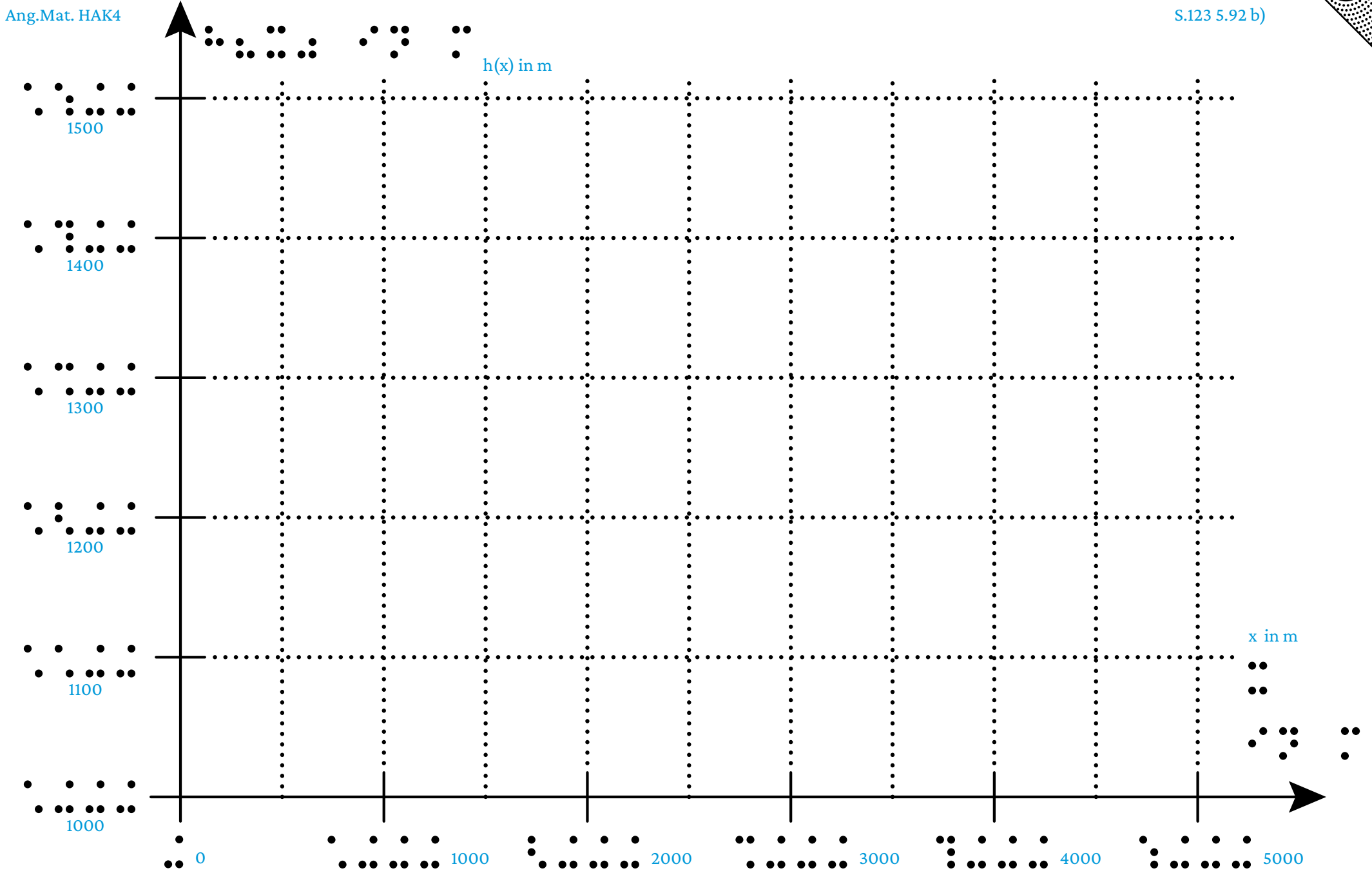
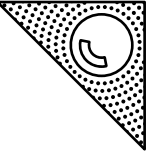


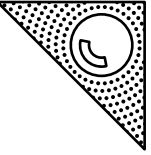
Produzenten haben somit $p^* \cdot x^* - \int_0^{x^*} p_N(x) dx$ gespart. Das nennt man Produzentenrente.





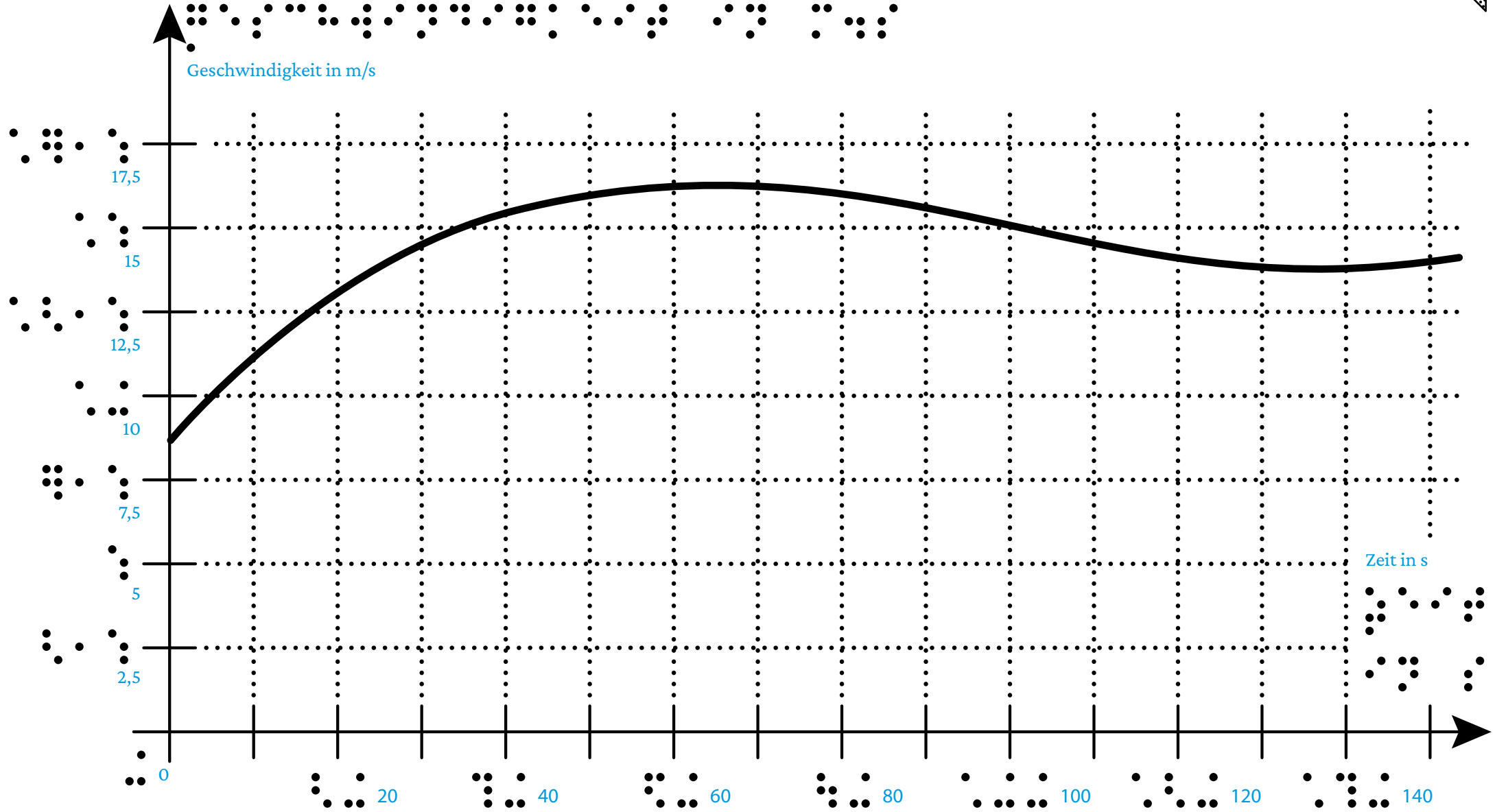


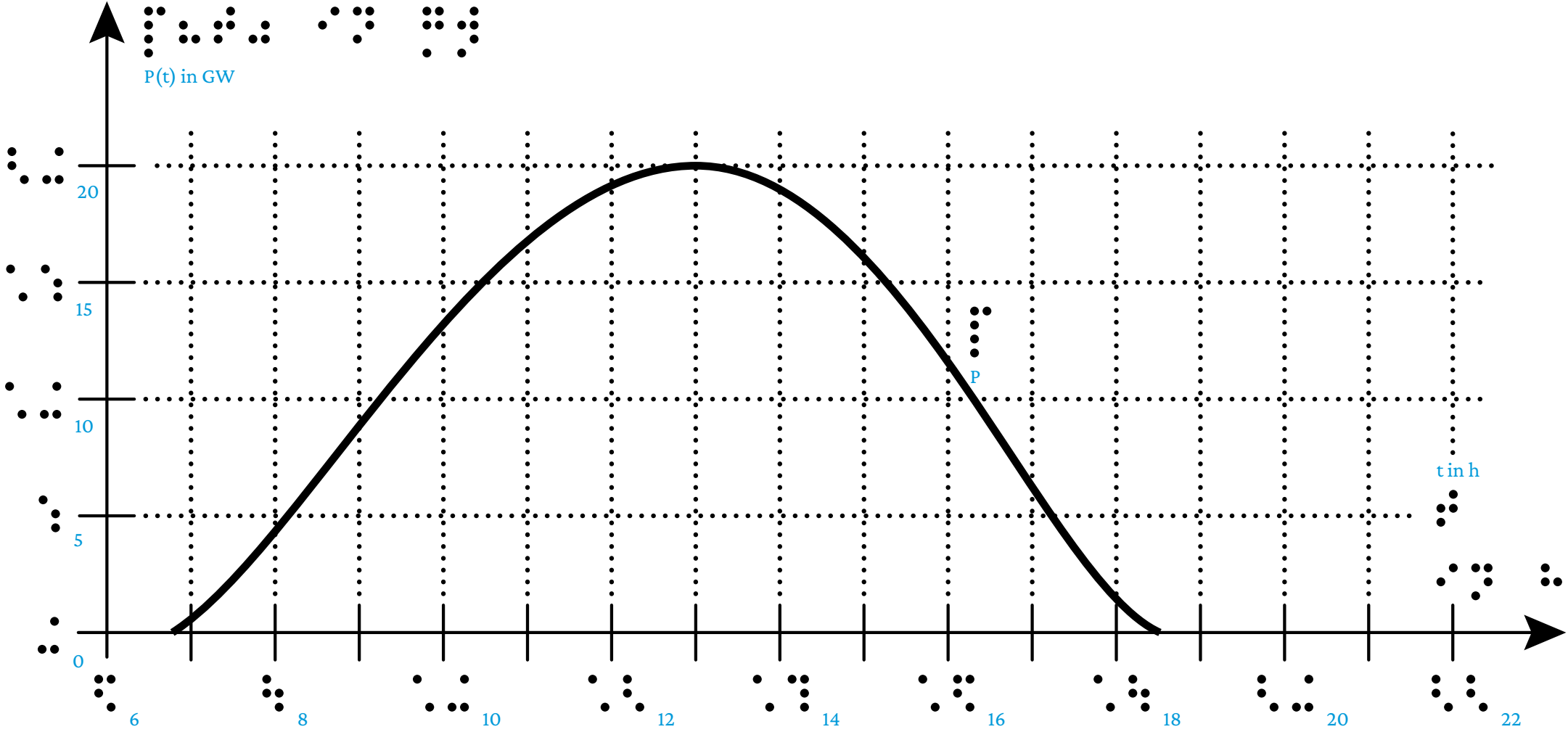
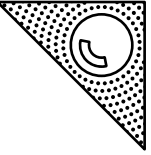


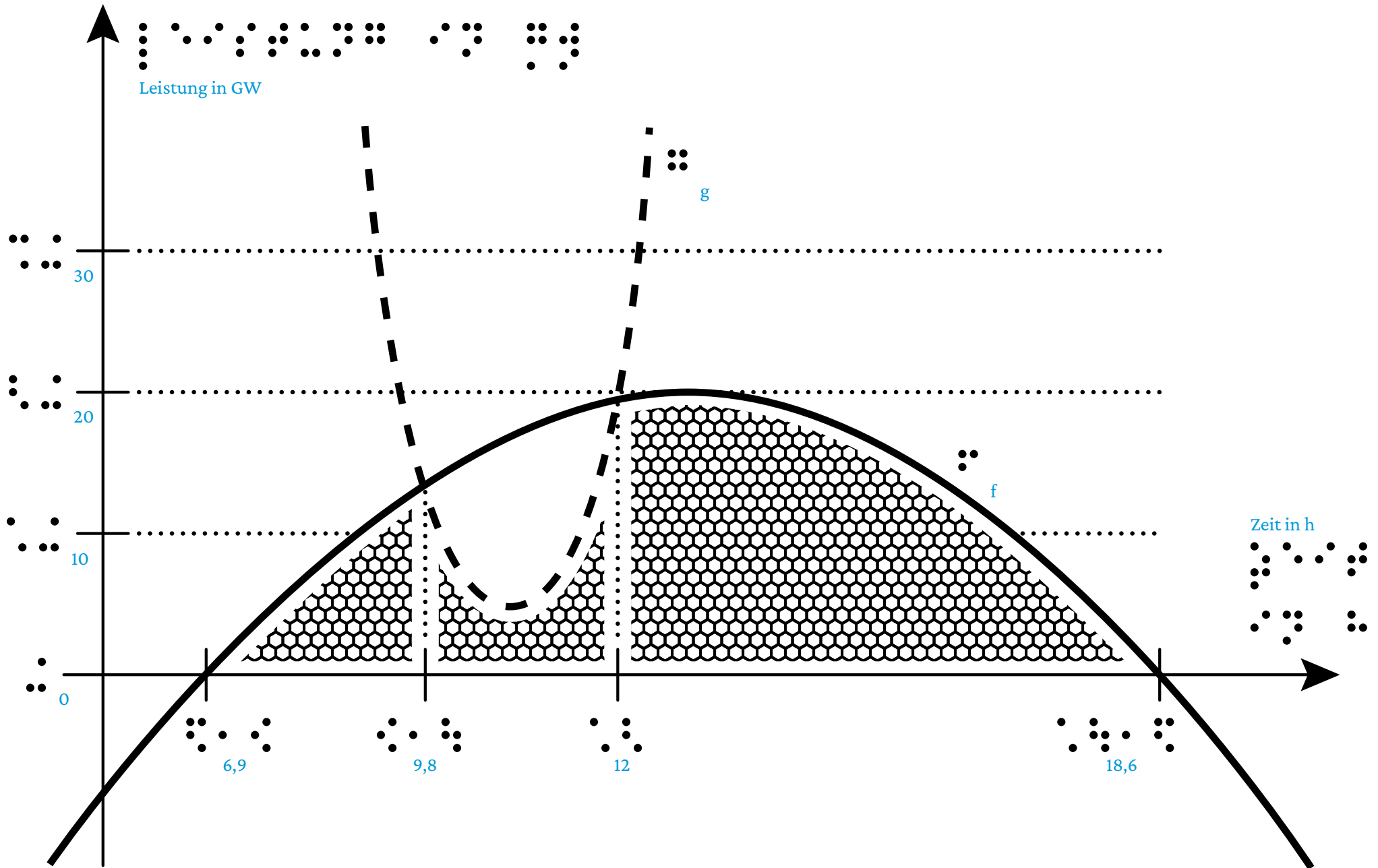
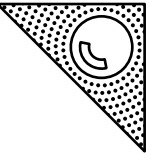


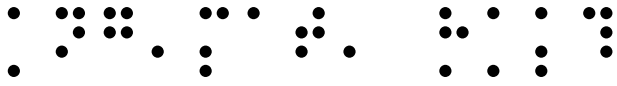
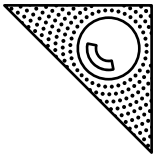
Geschwindigkeit in m/s

Zeit in s









Ang.Mat. HAK4

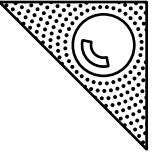
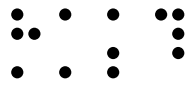
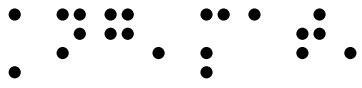


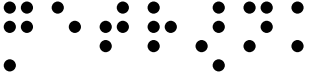
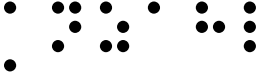
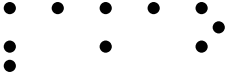

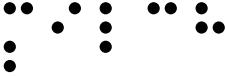

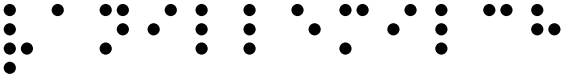

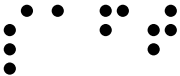



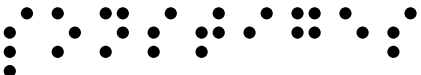

6. Beschreibende Statistik

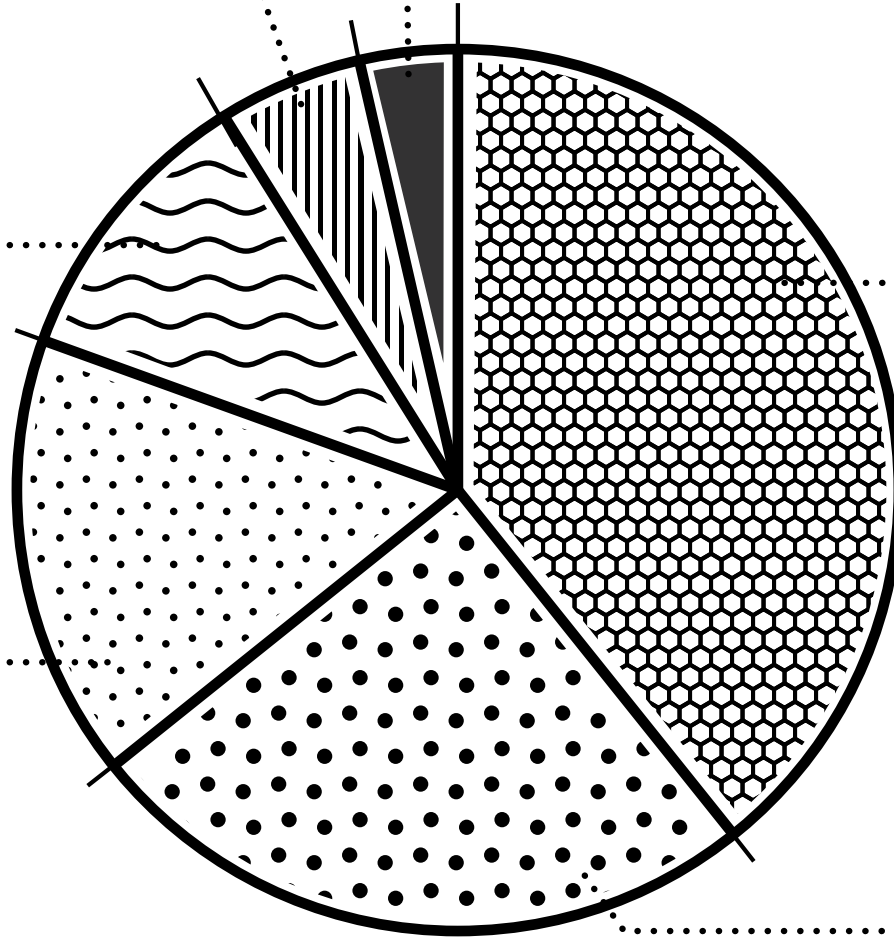
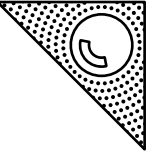
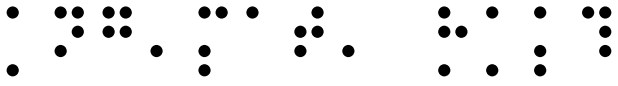
Angewandte Mathematik HAK Band 4

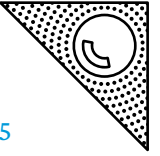
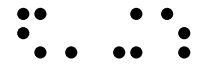
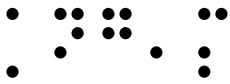
6.

Beschreibende Statistik

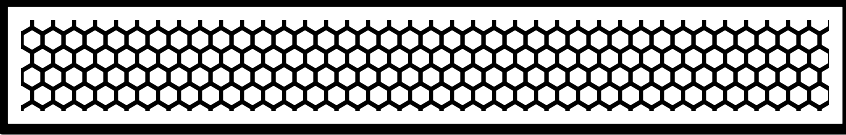


 Getränk	 Anzahl
 Kakao	 22
 Milch	 14
 Vanillemilch	 3
 Saft	 9
 Tee	 6
 Sonstiges	 2



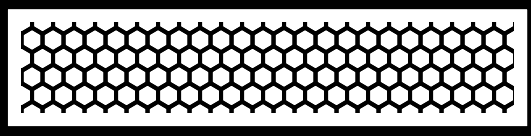


NÖ



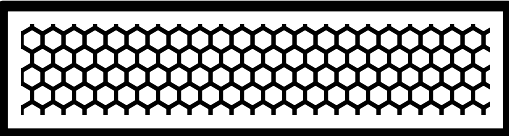
3300 km

OÖ



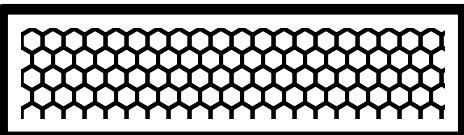
2100 km

Stmk



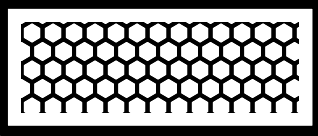
2000 km

Bgld



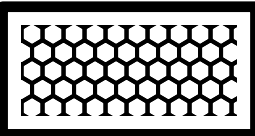
1800 km

Wien



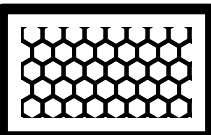
1222 km

Ktn



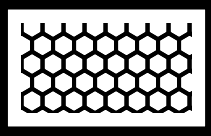
1000 km

Tir



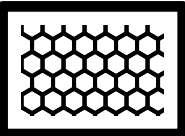
800 km

Vlgb

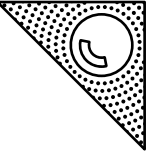


800 km

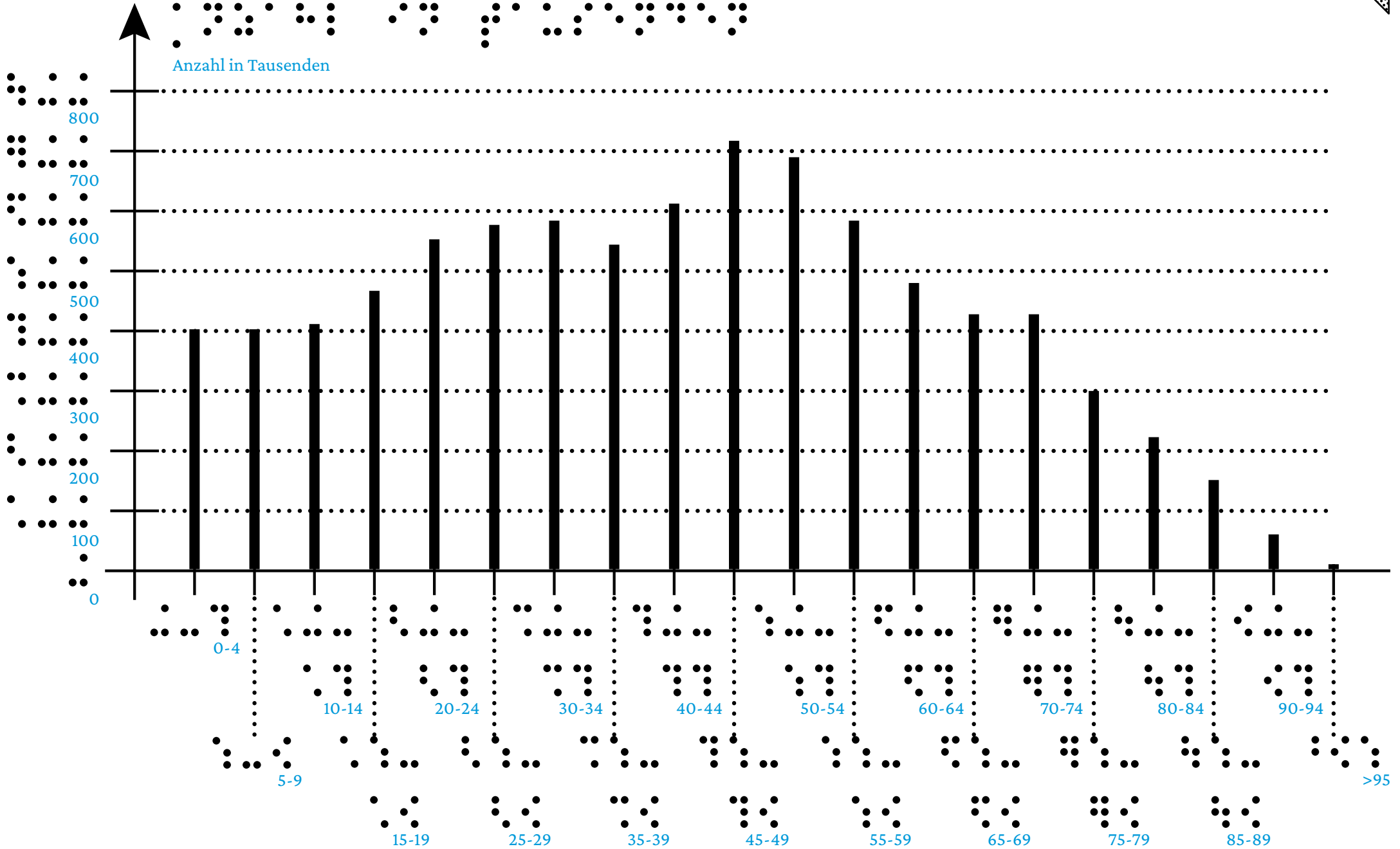
Sbg

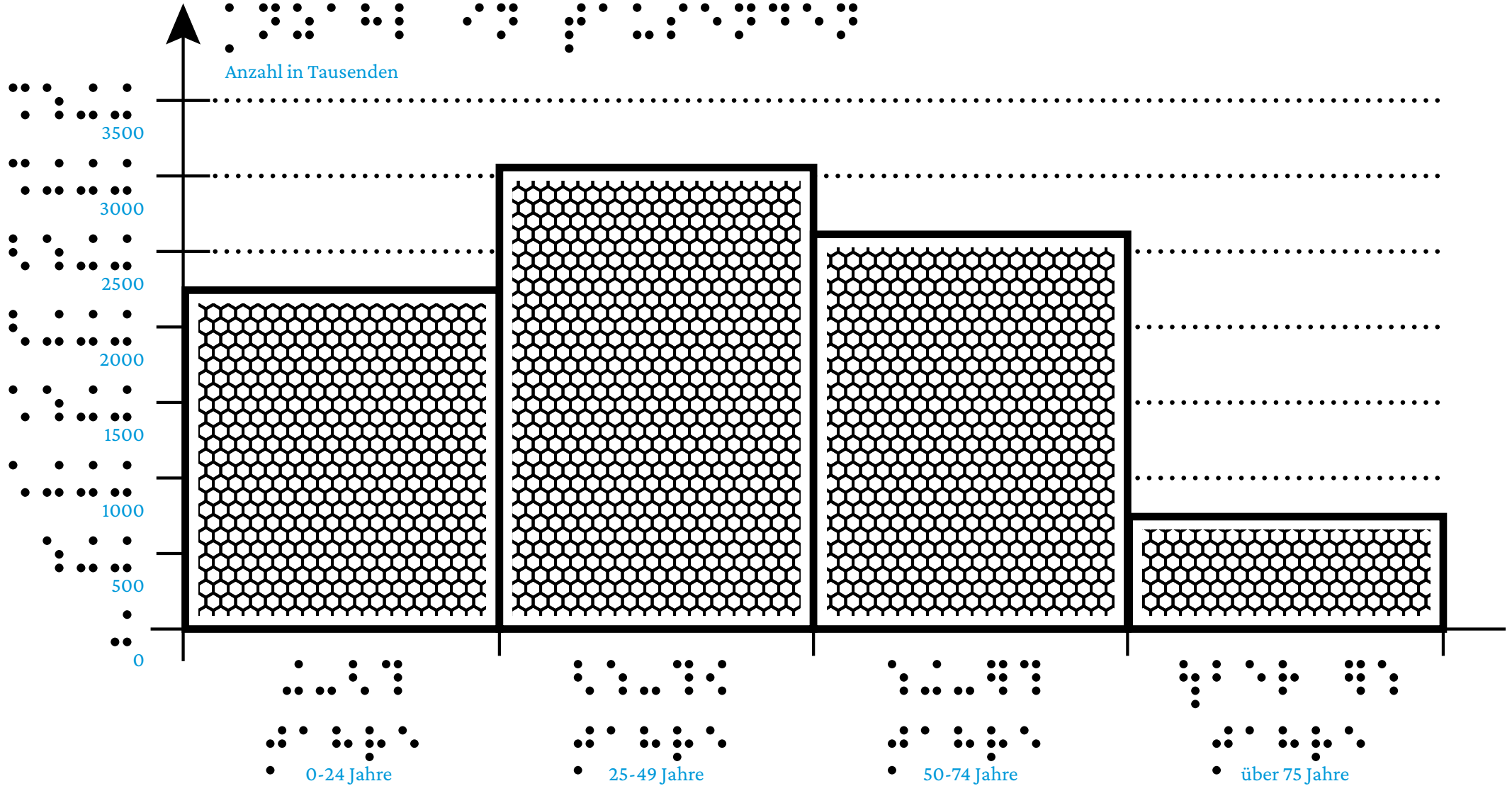
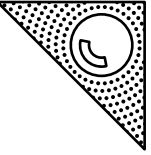


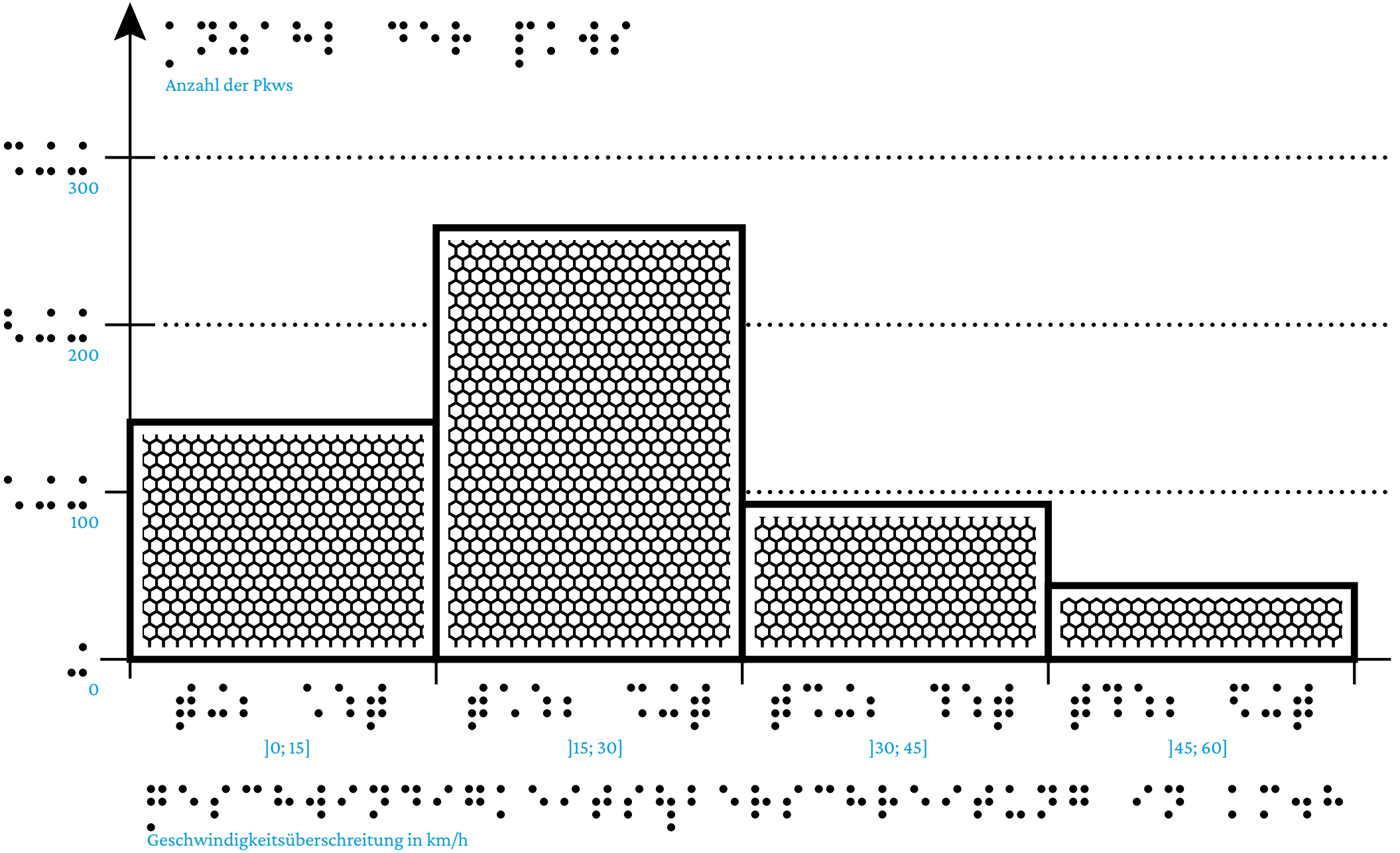
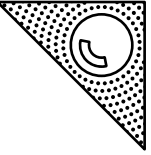
685 km

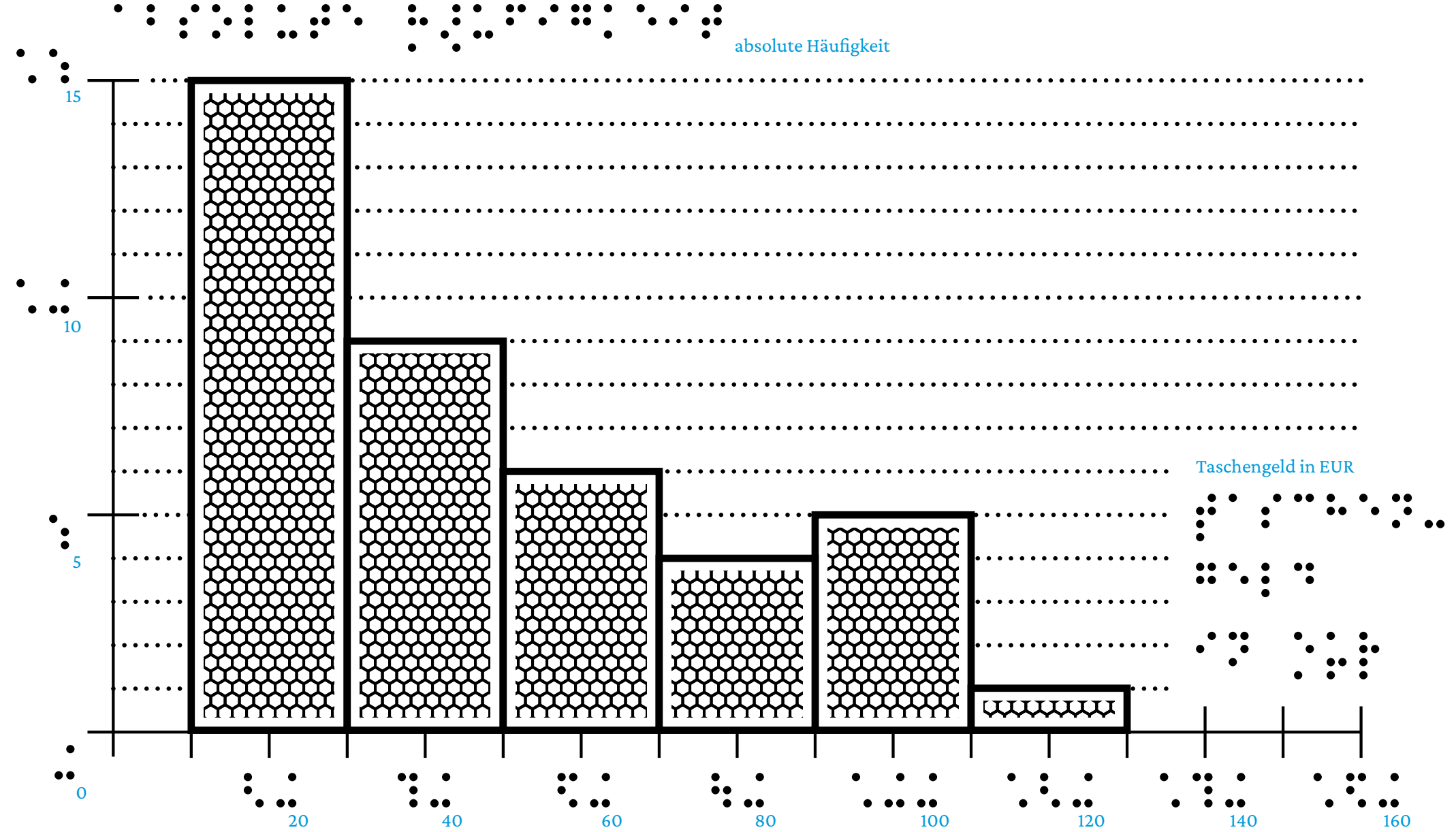
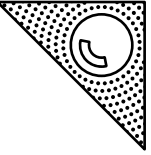


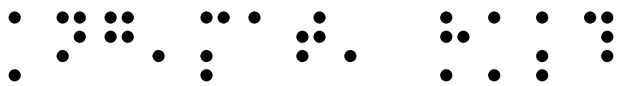
Anzahl in Tausenden



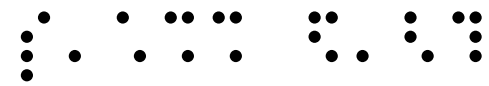




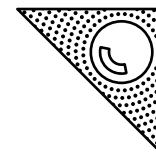




Ang.Mat. HAK4



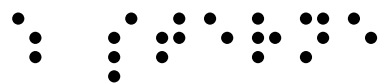
S.133 6.24



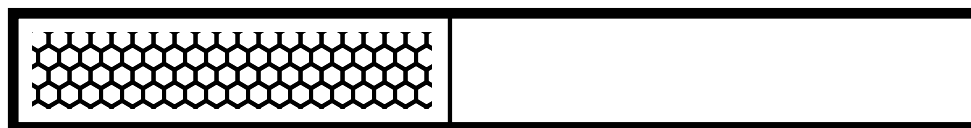
84



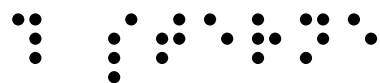
3,5 von 5 Sternen



5 Sterne



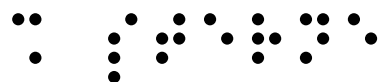
38



4 Sterne



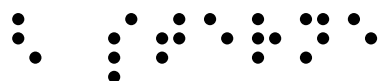
14



3 Sterne



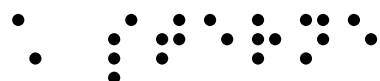
12



2 Sterne



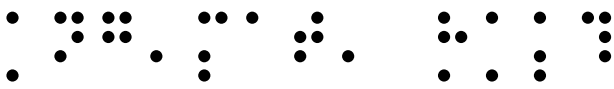
12



1 Sterne

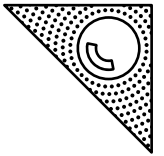


8

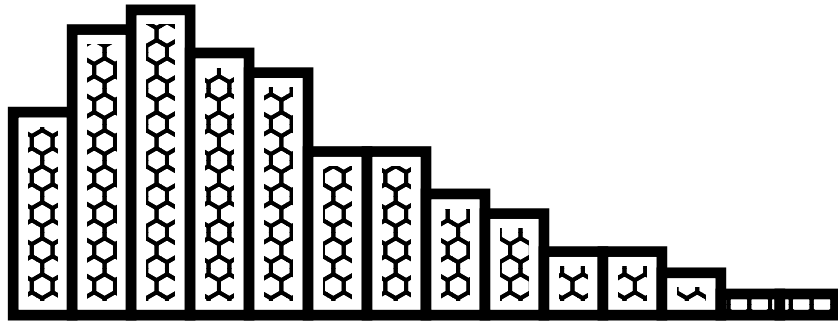


Ang.Mat. HAK4

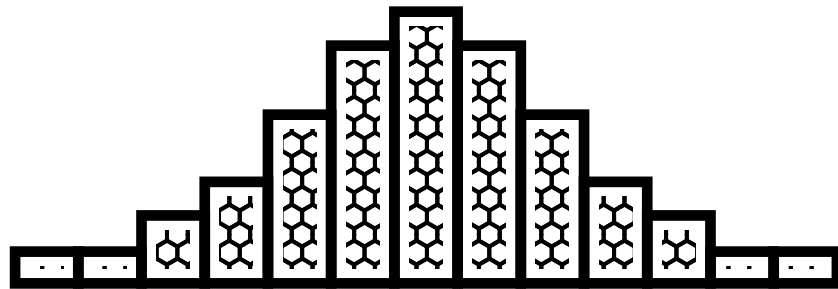
S.134



rechtsschiefe Verteilung

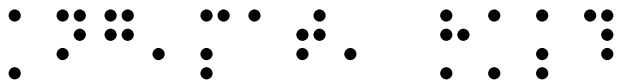


symmetrische Verteilung



linksschiefe Verteilung

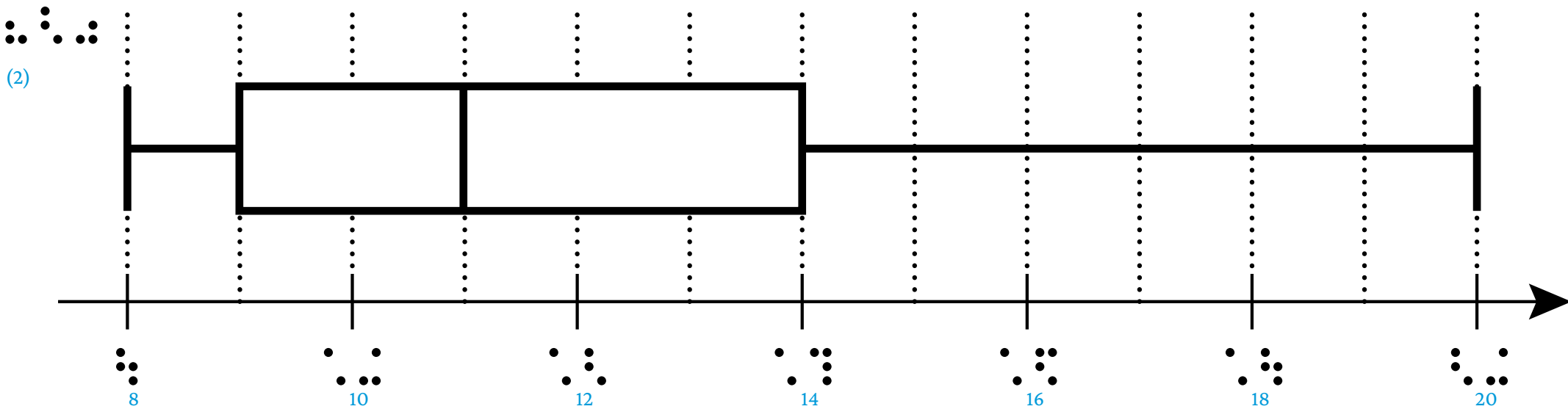
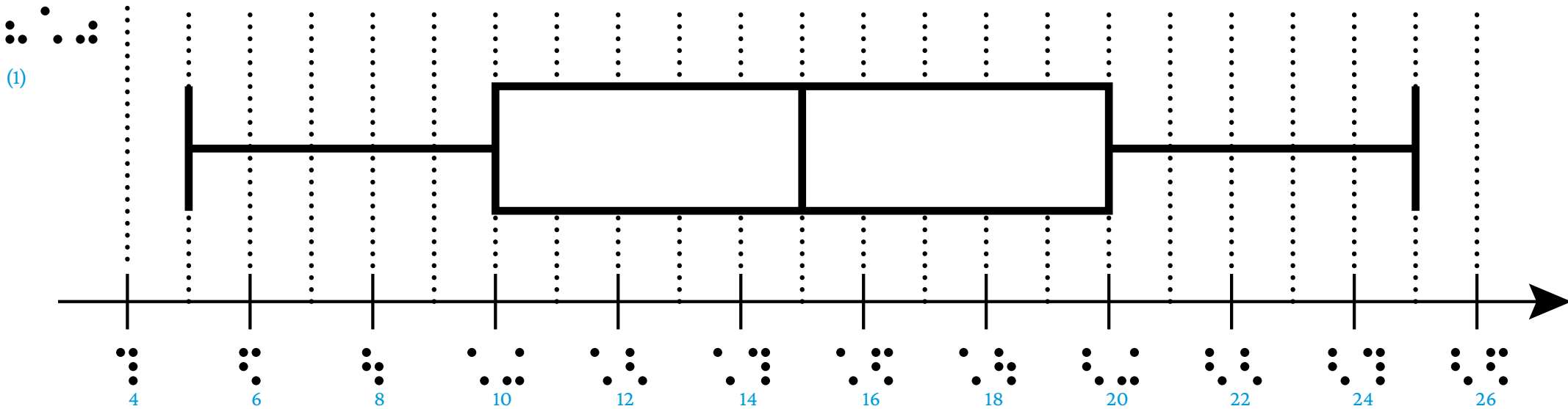
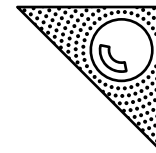


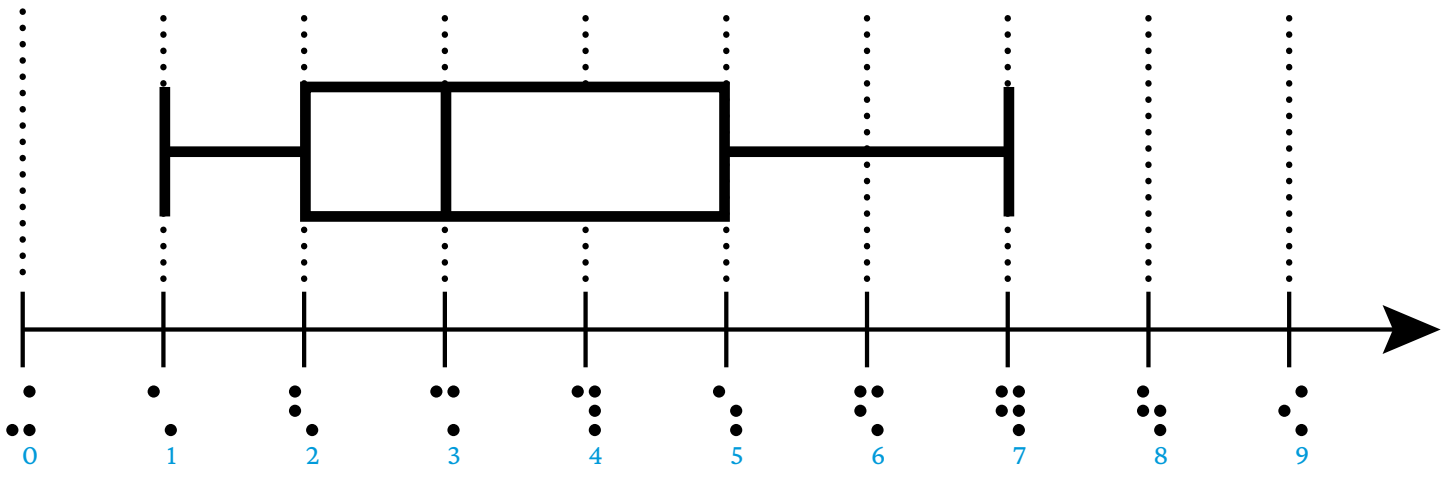
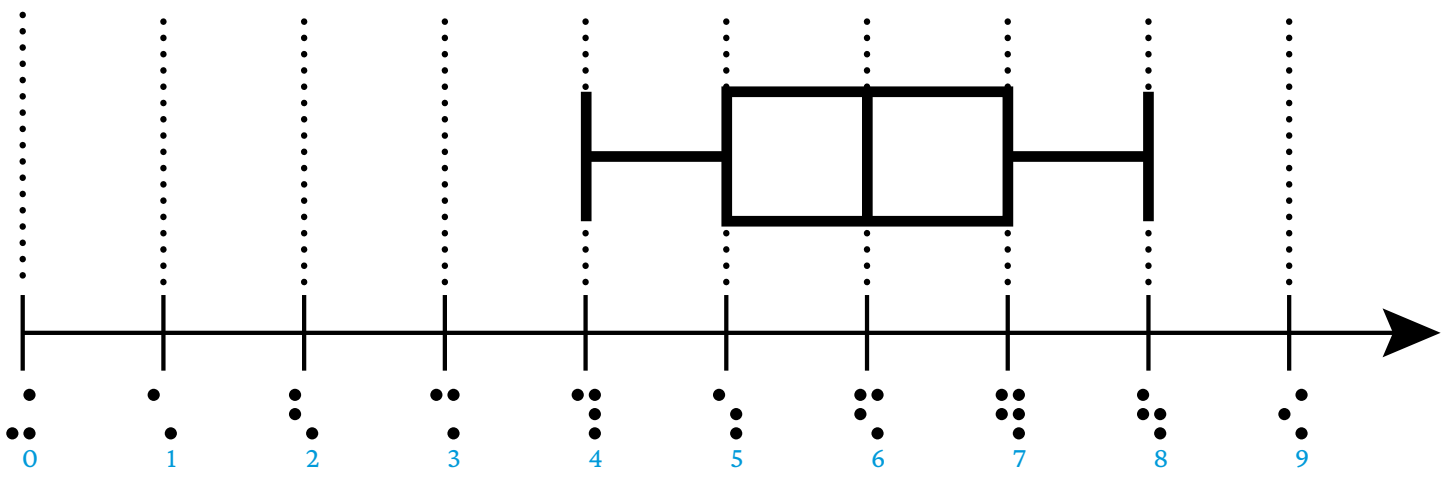
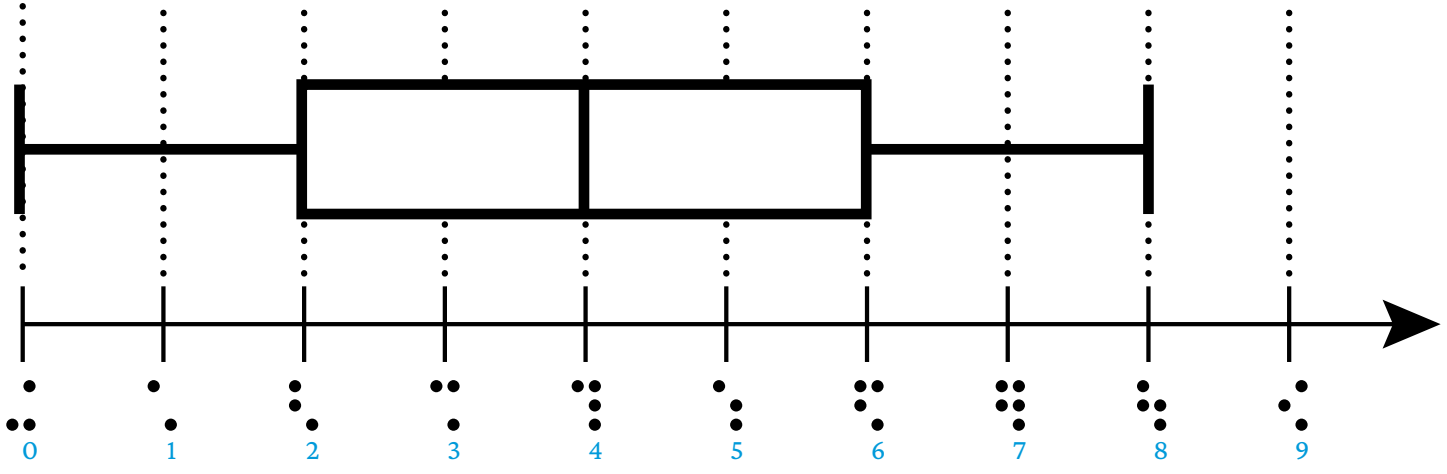
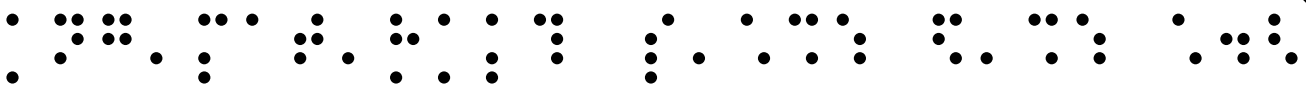


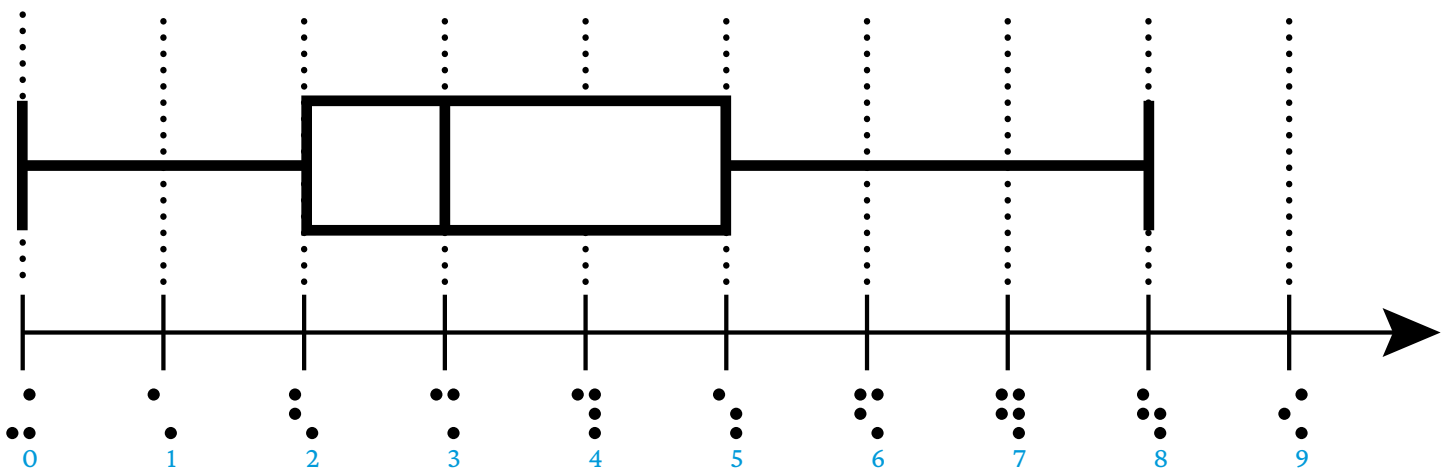
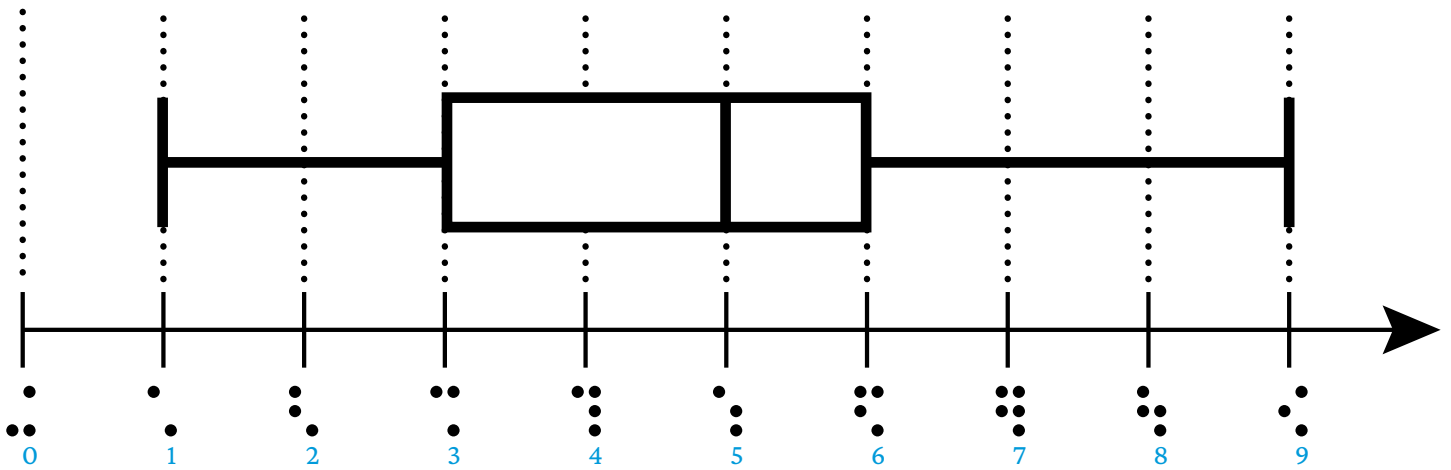
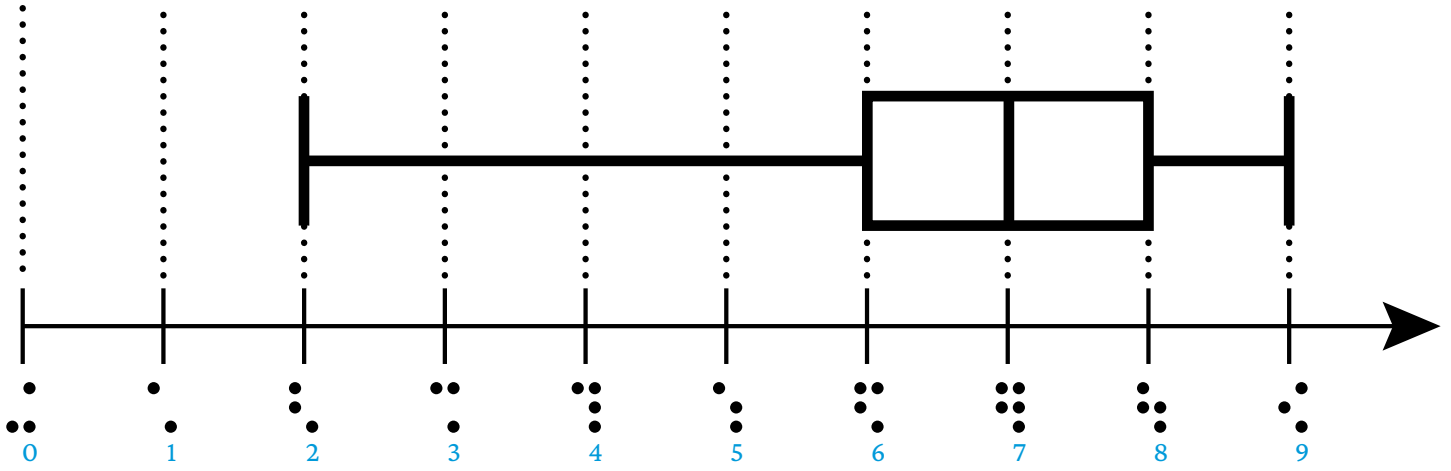
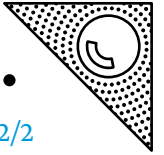
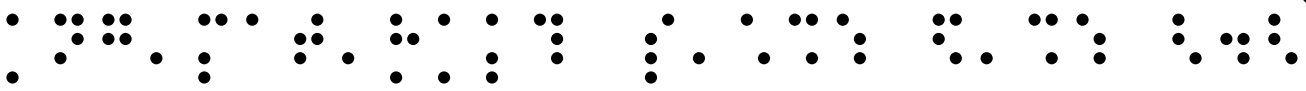
Ang.Mat. HAK4

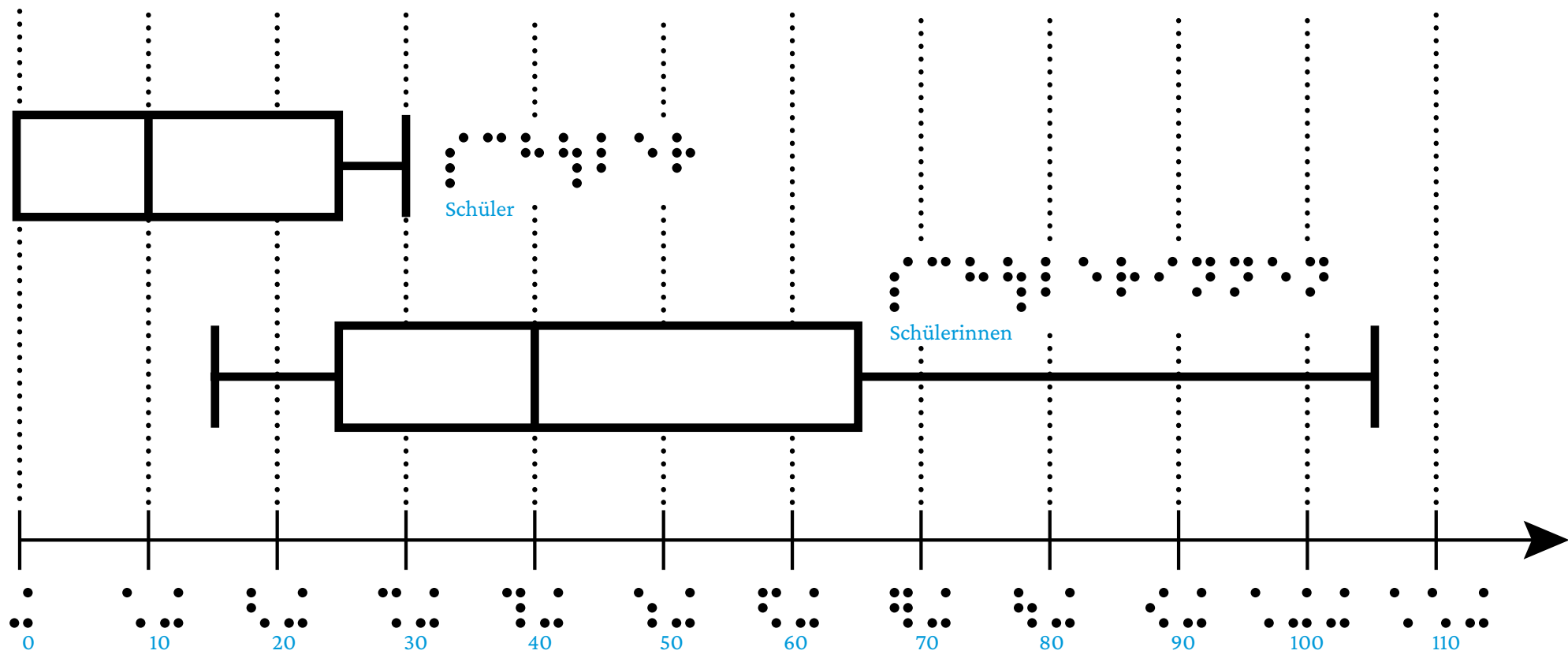
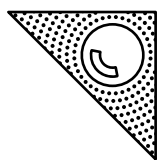


S.135 6.32





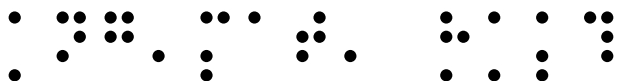




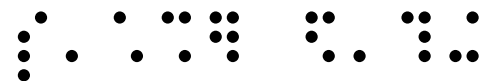
Schüler

Schülerinnen

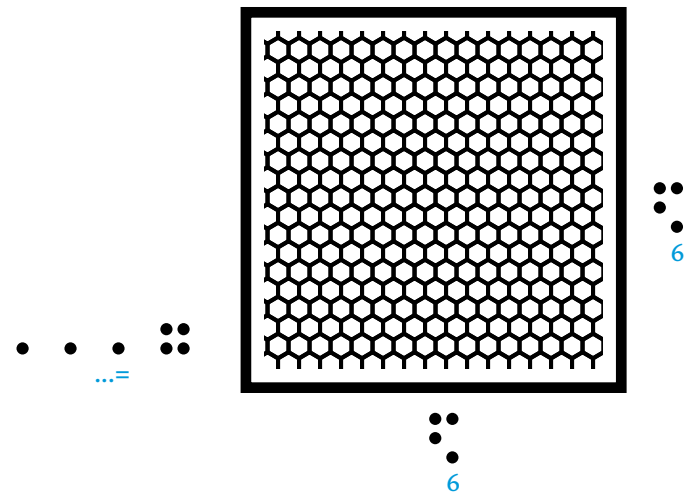
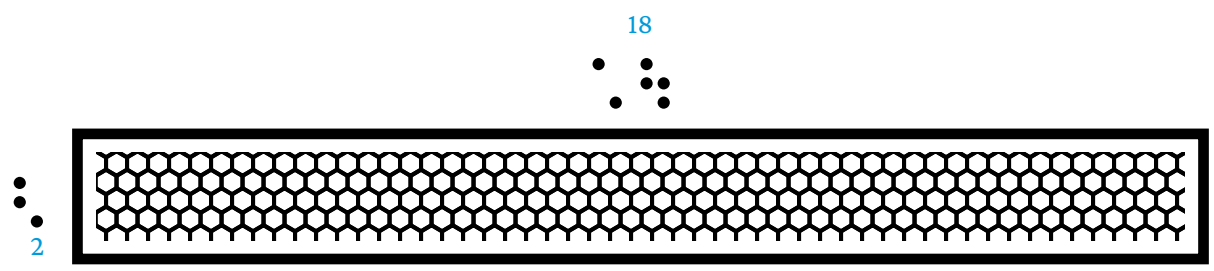
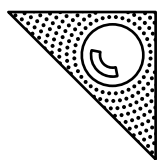
Nachrichten pro Tag

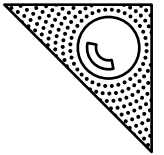
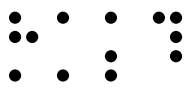
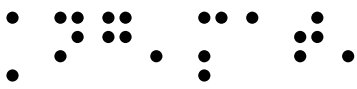


Ang.Mat. HAK4

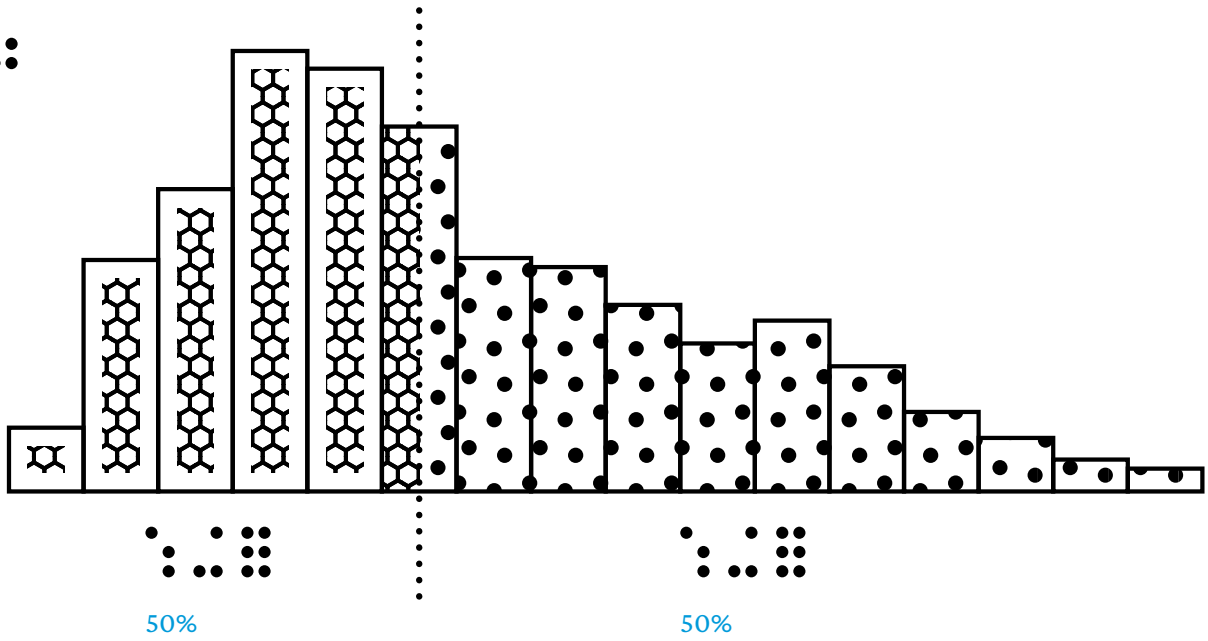


S.137 6.40

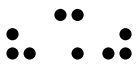
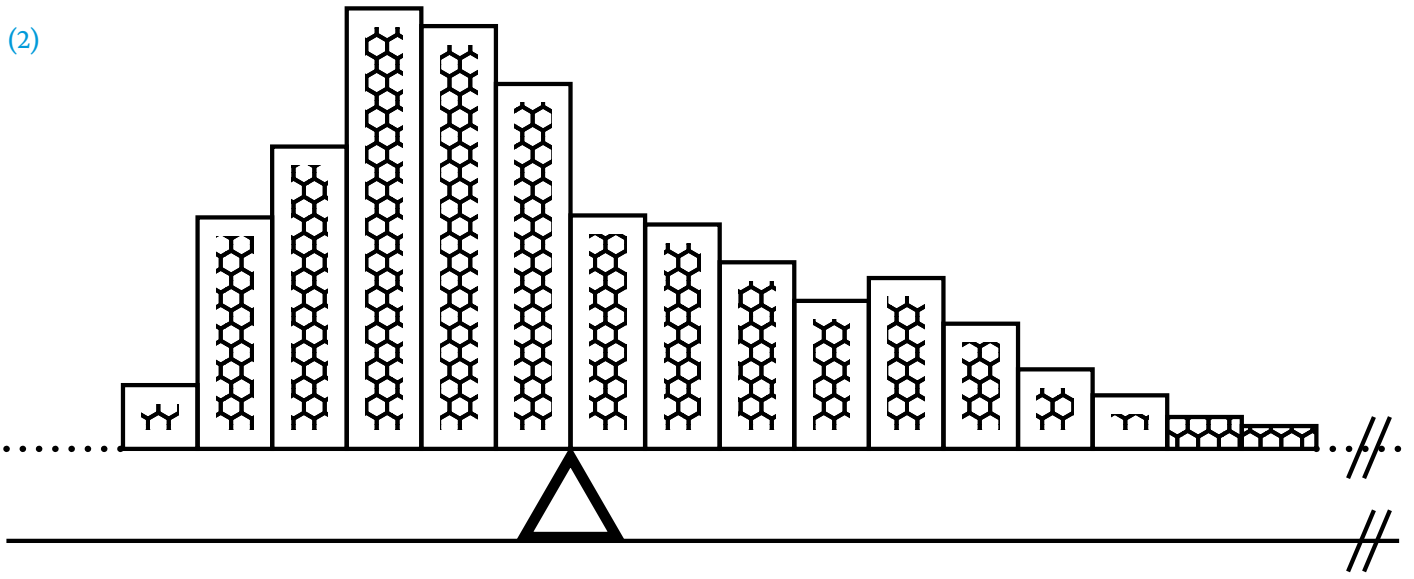




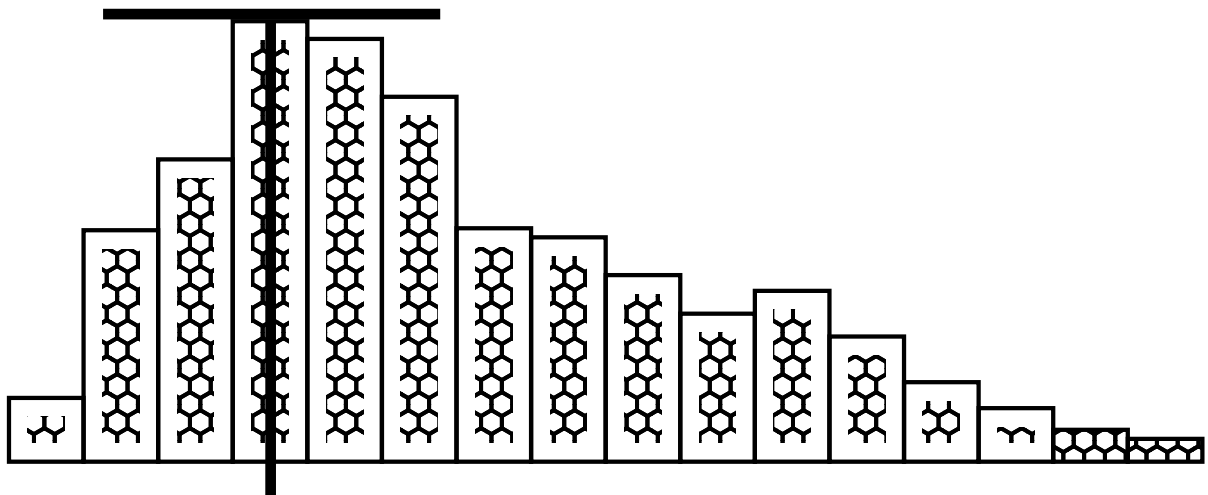
(1)

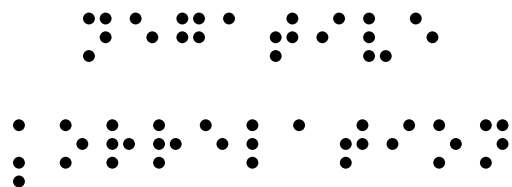
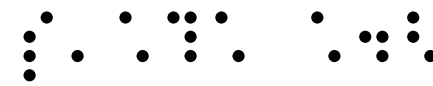
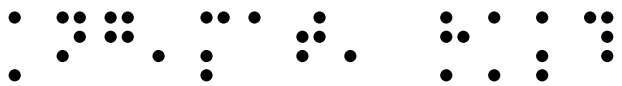


(2)

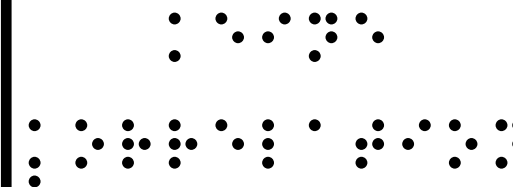


(3)

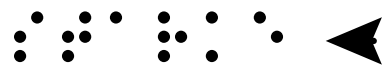




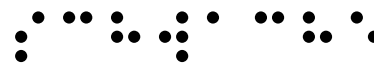
negative Korrelation



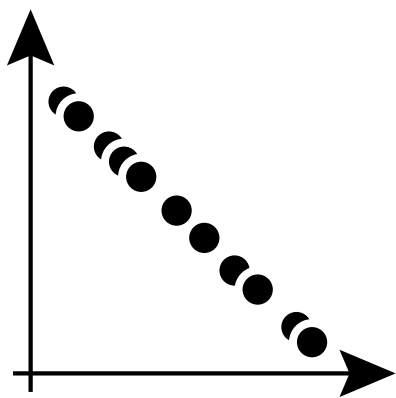
keine Korrelation



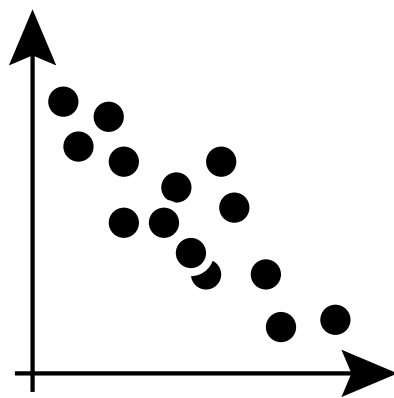
starke



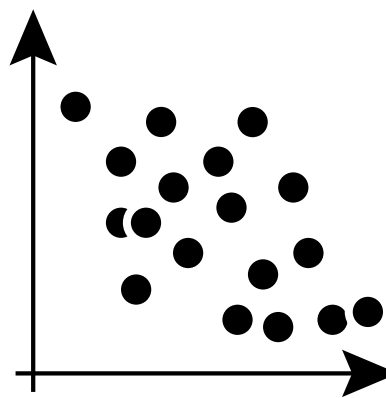
schwache



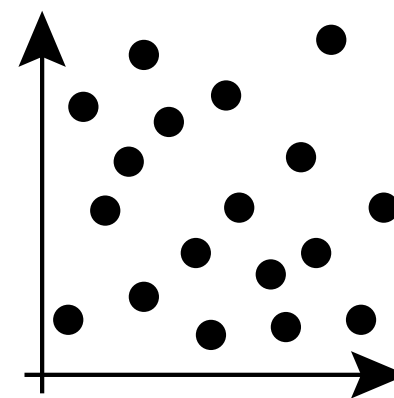
$r = -1$



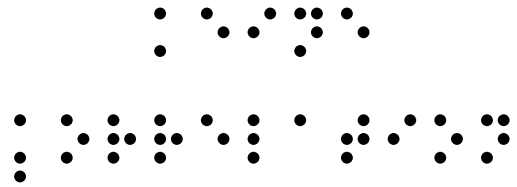
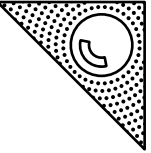
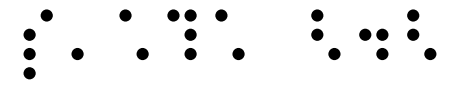
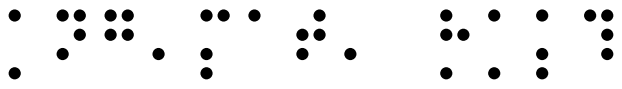
$r = -0,7$



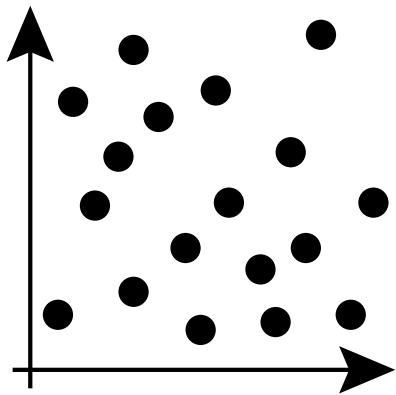
$r = -0,4$



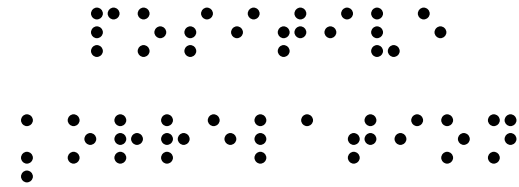
$r = 0$



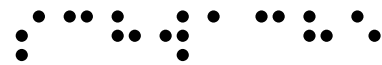
keine Korrelation



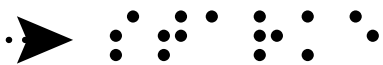
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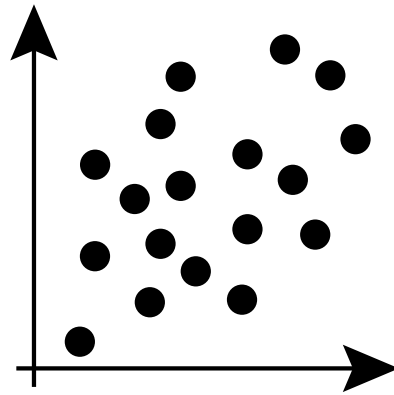
positive Korrelation



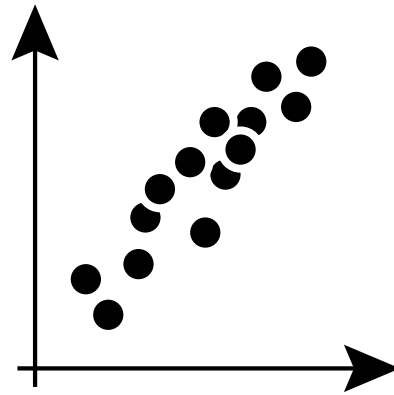
schwache



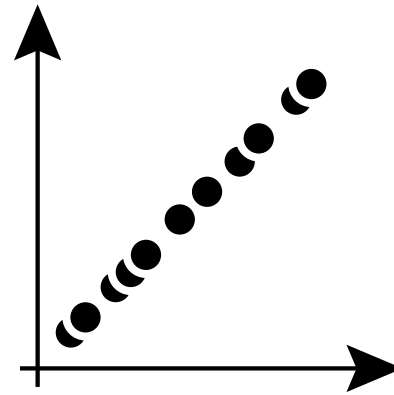
starke



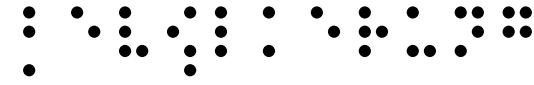
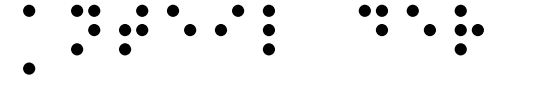
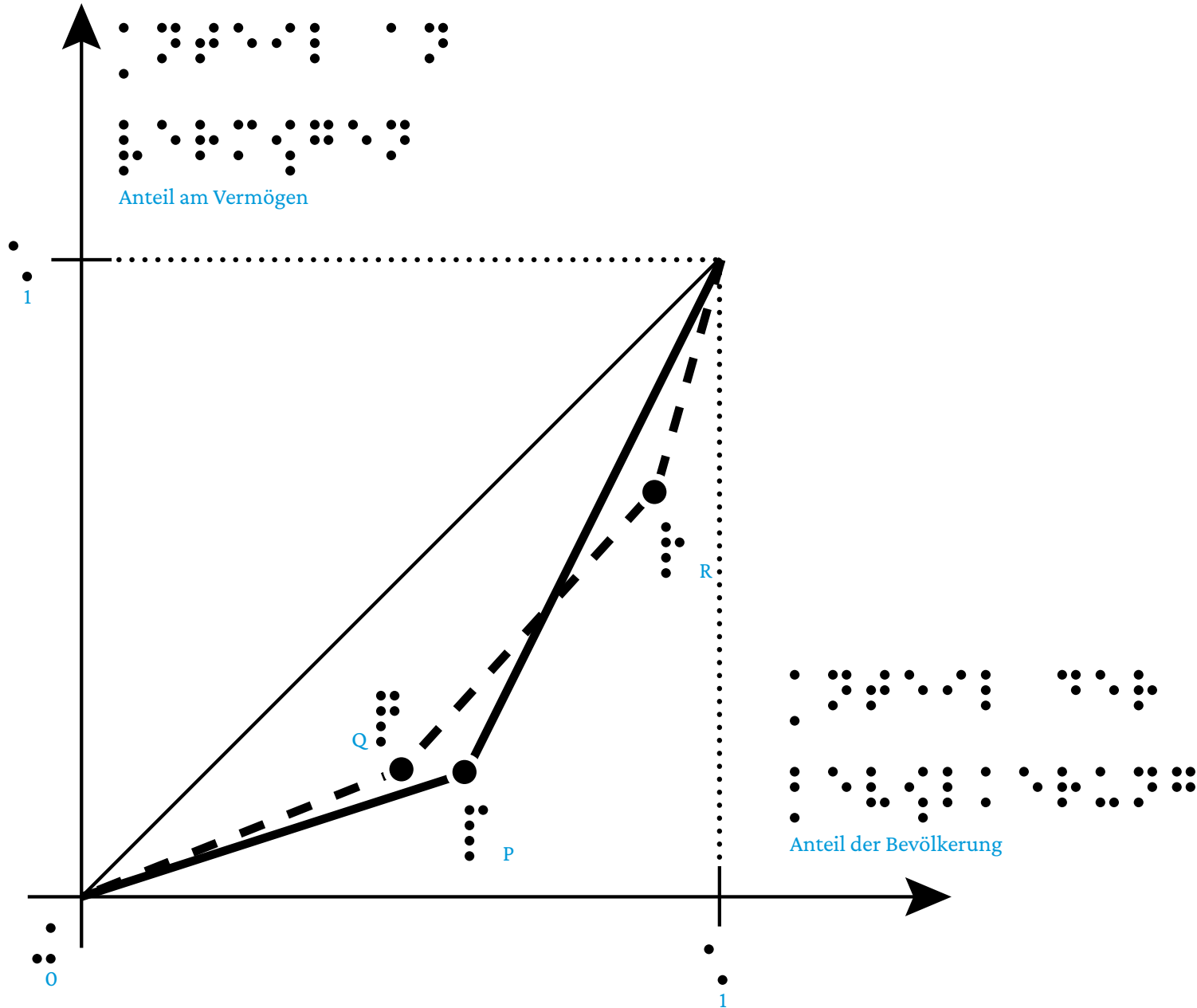
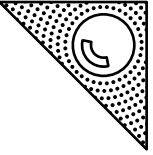
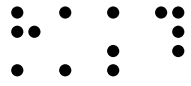
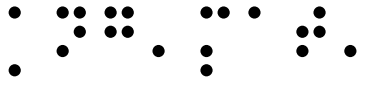
$r=0,3$

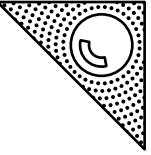


$r=0,8$

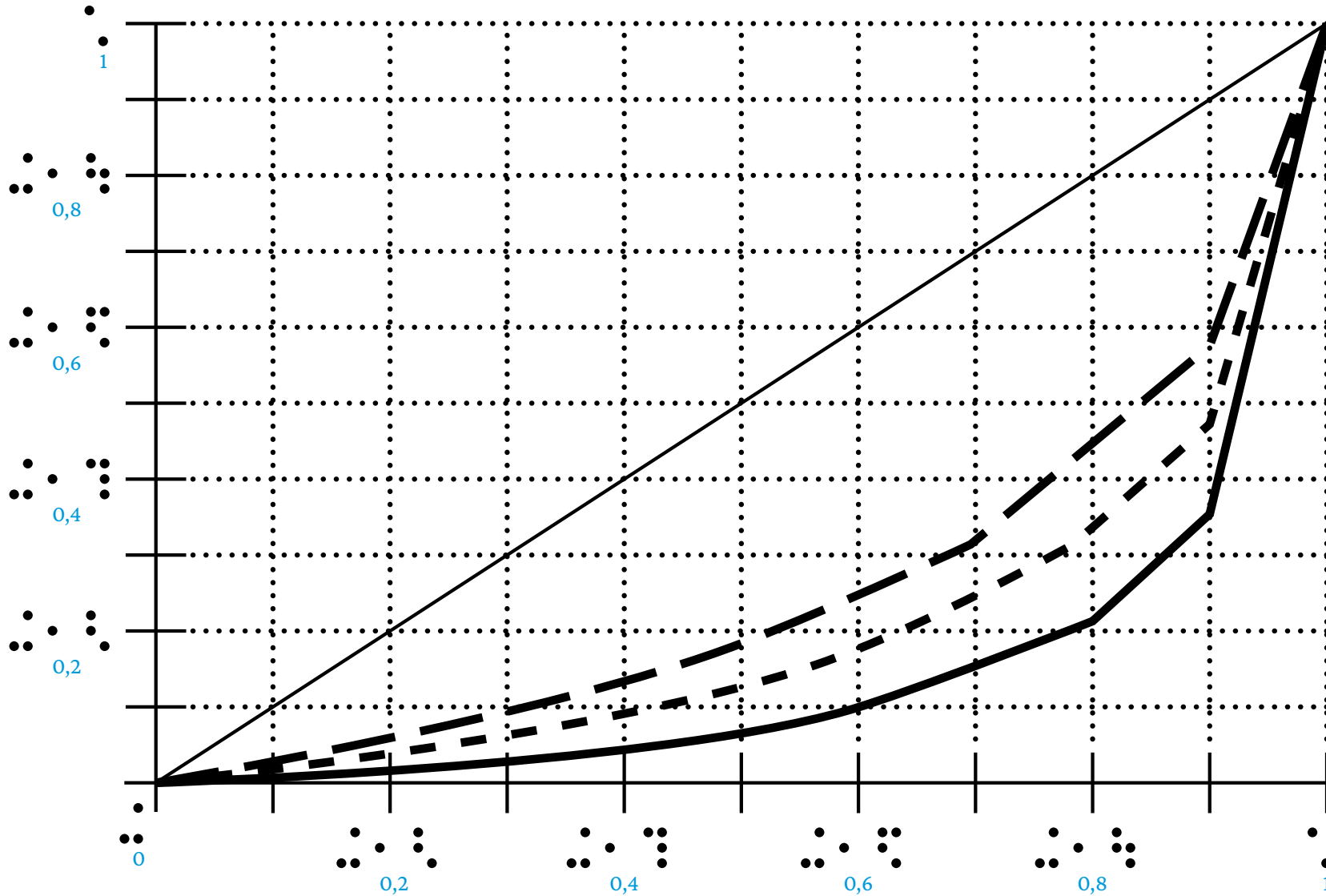


$r=1$





Anteil am Gesamteinkommen



Legende:

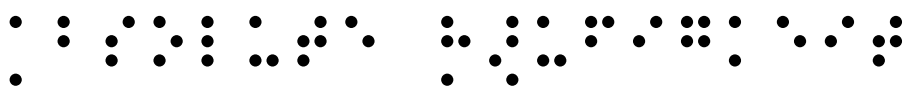
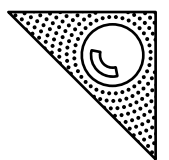
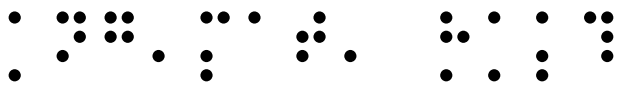
GV (Gleichverteilung)

1993-94

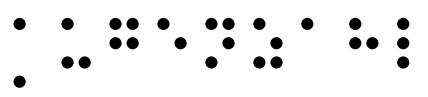
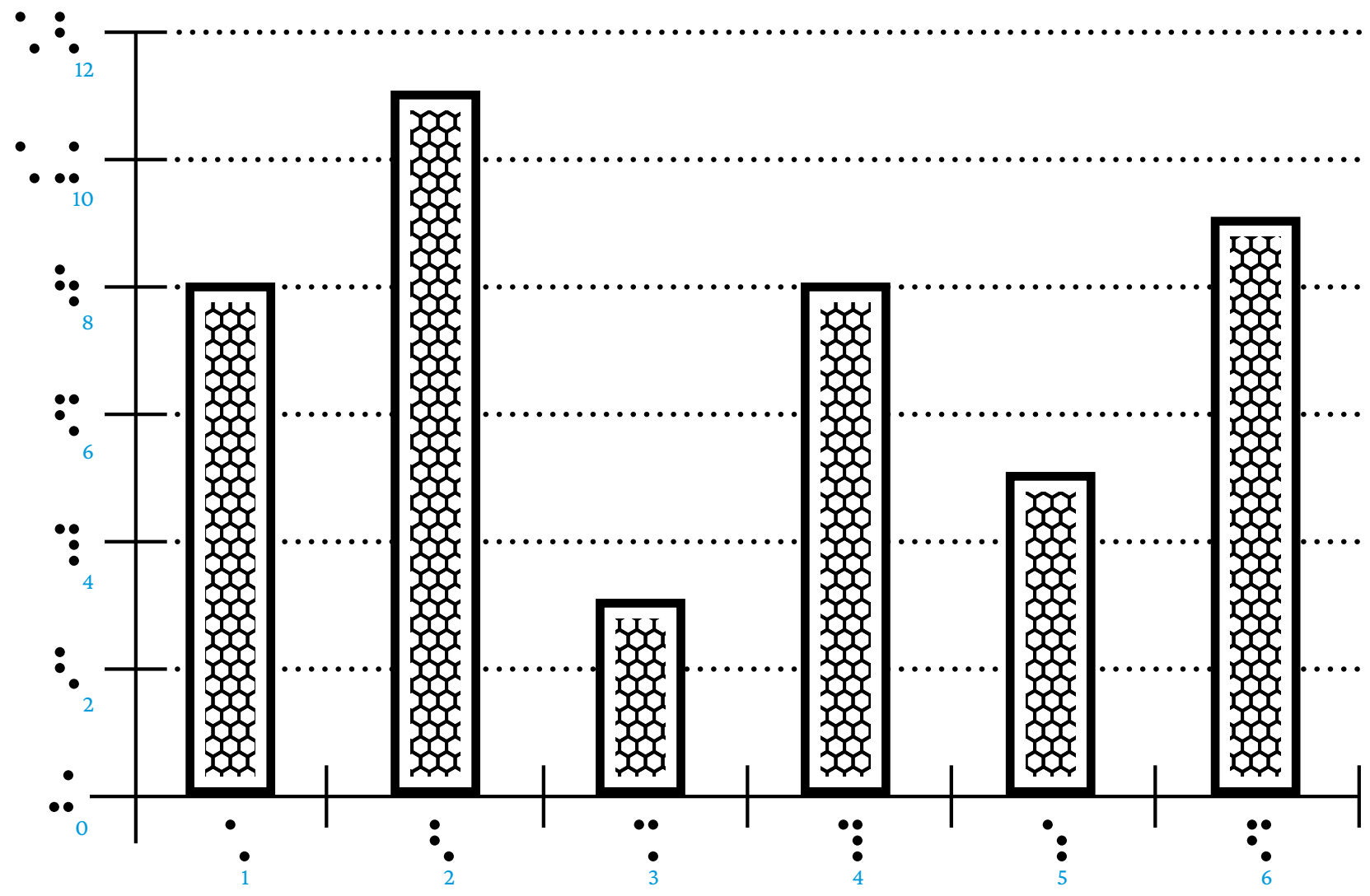
2003-04

2009-10

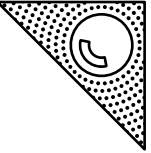
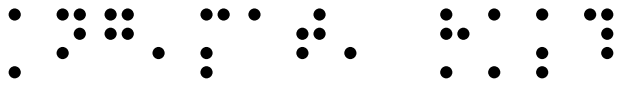
Anteil der Haushalte

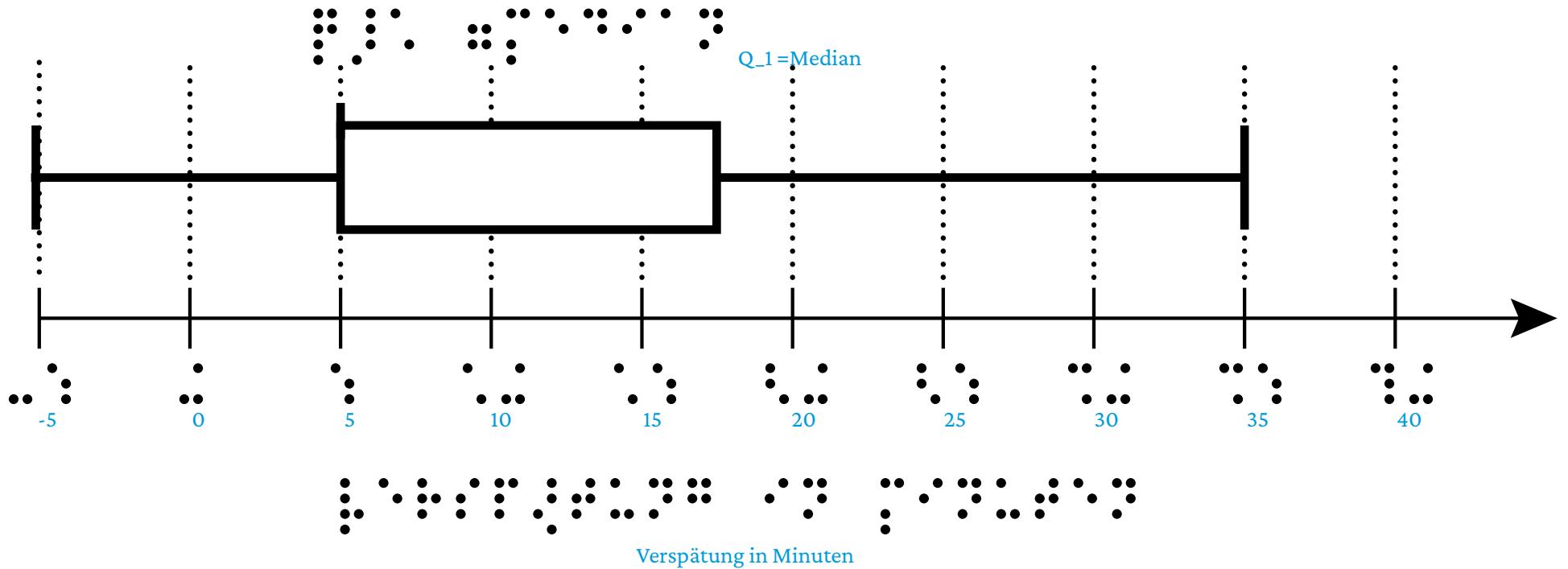


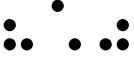
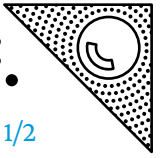
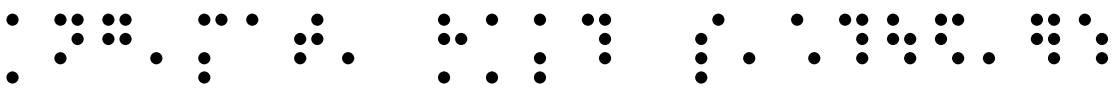
Absolute Häufigkeit



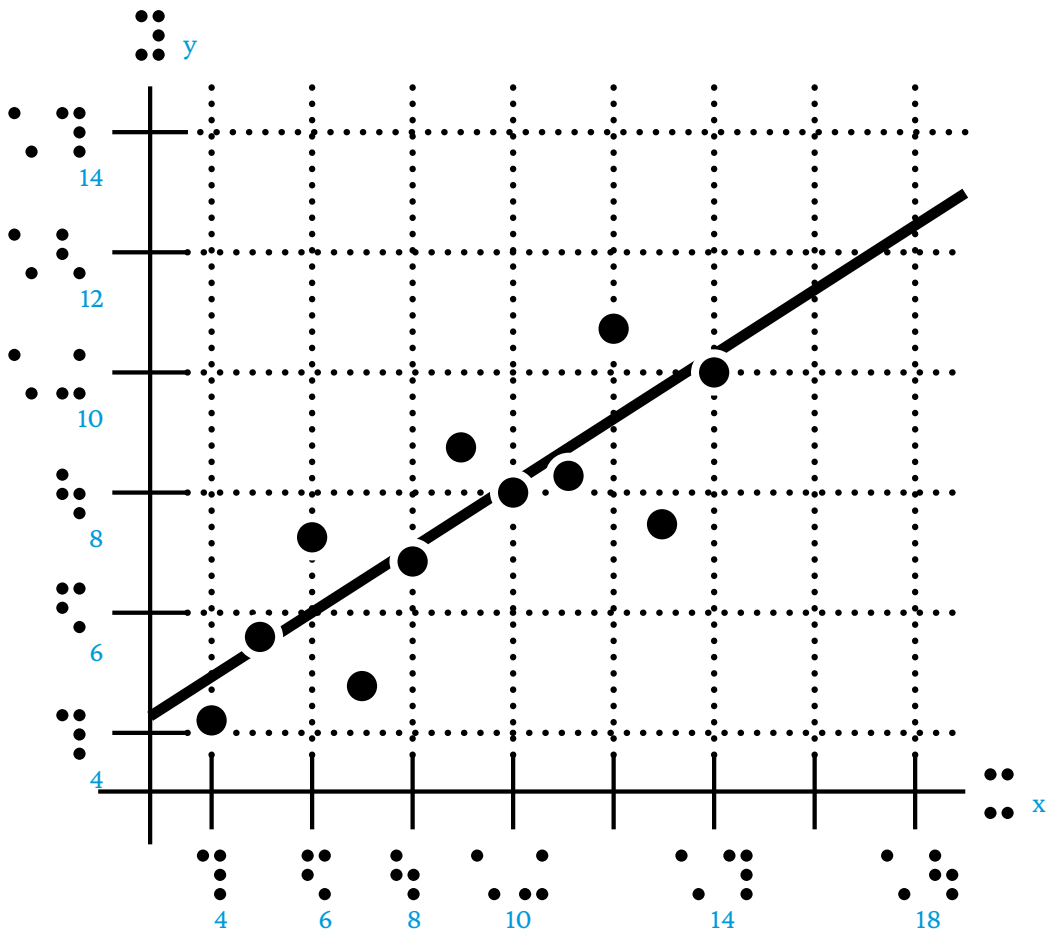
AUgenzahl



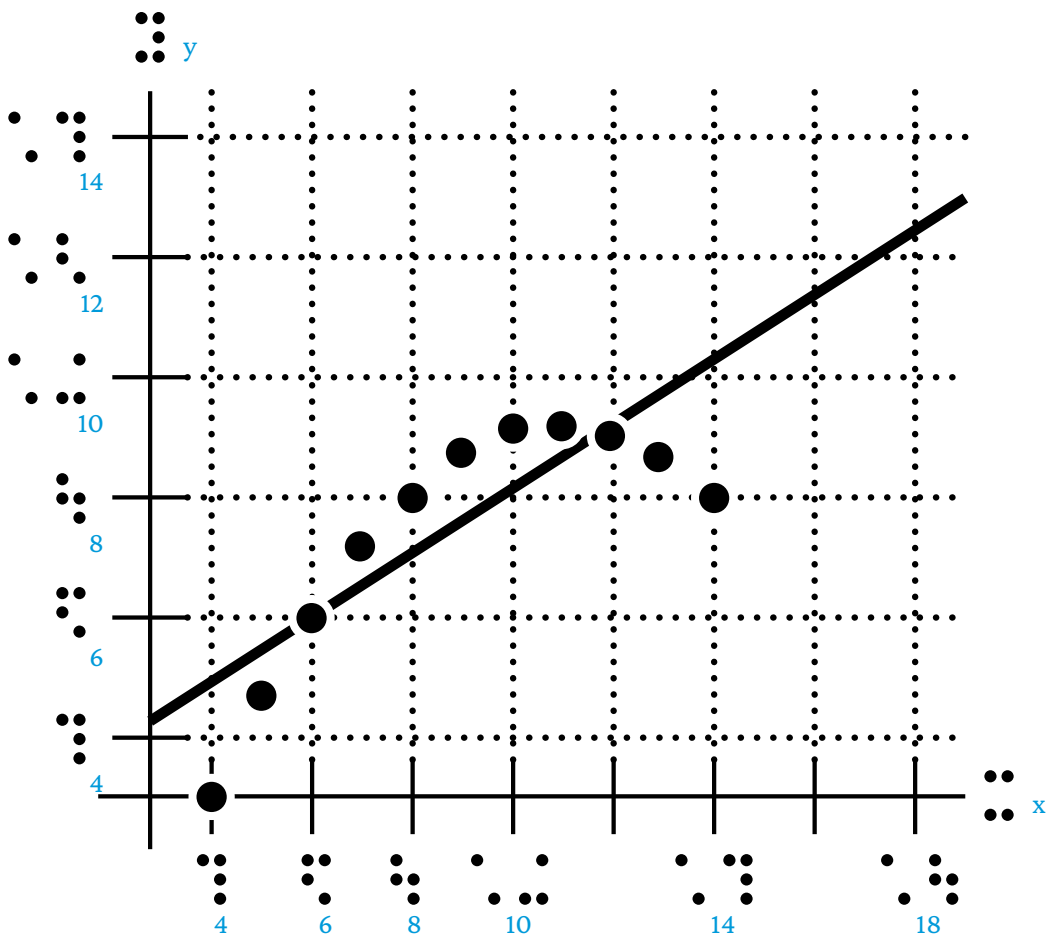


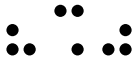
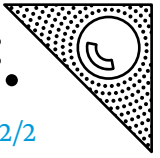
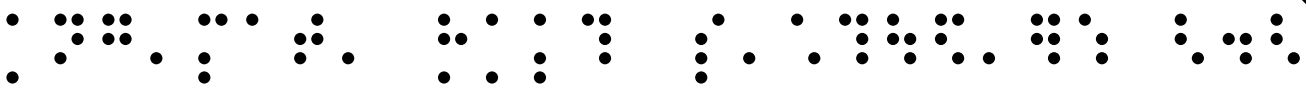


(1)



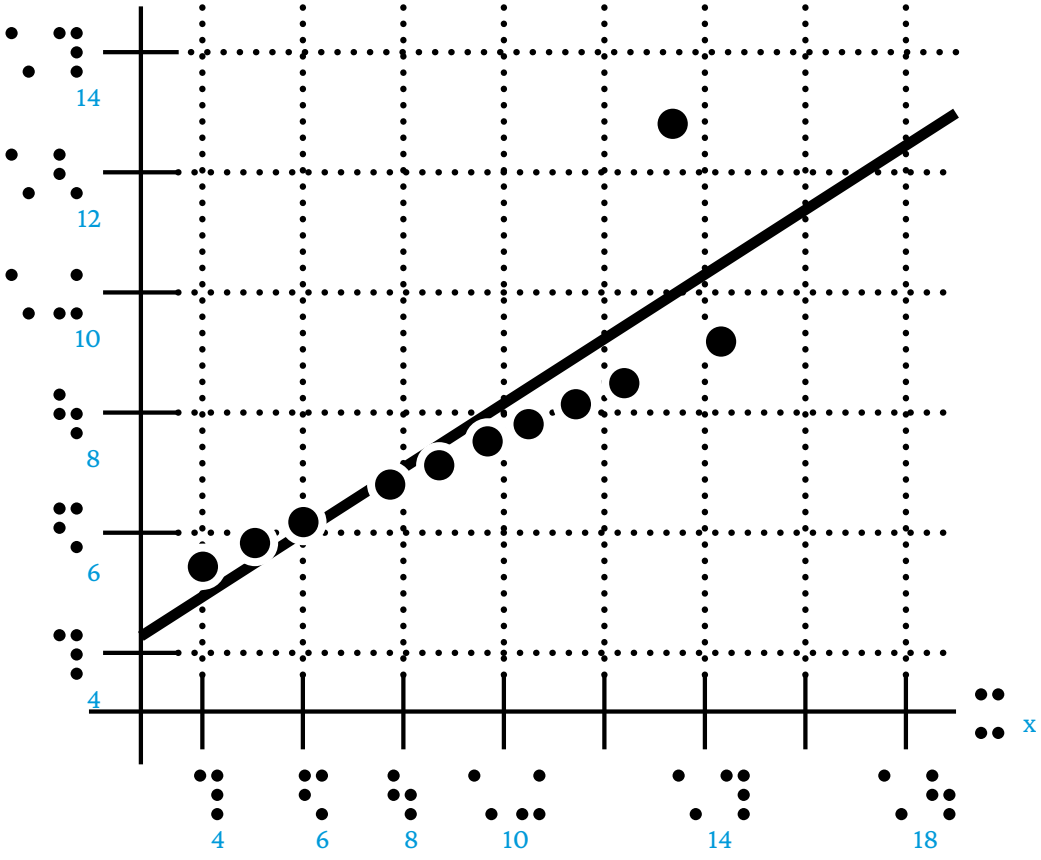
(2)





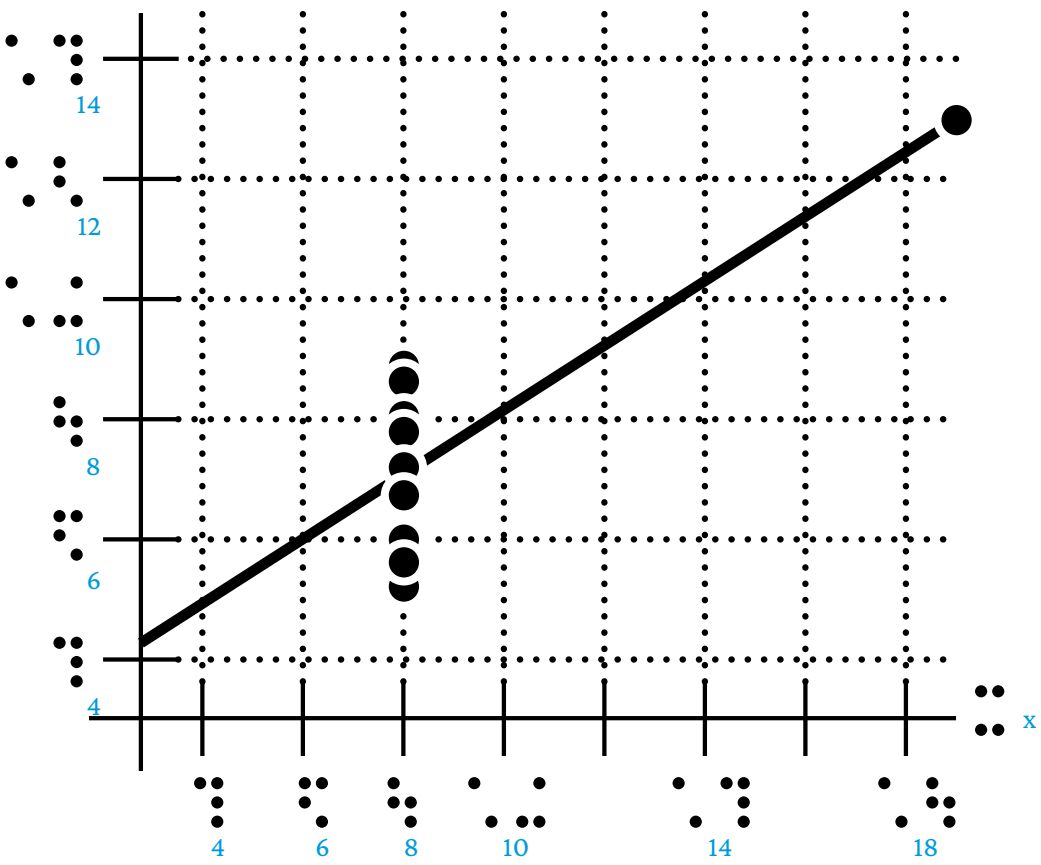
y

(3)



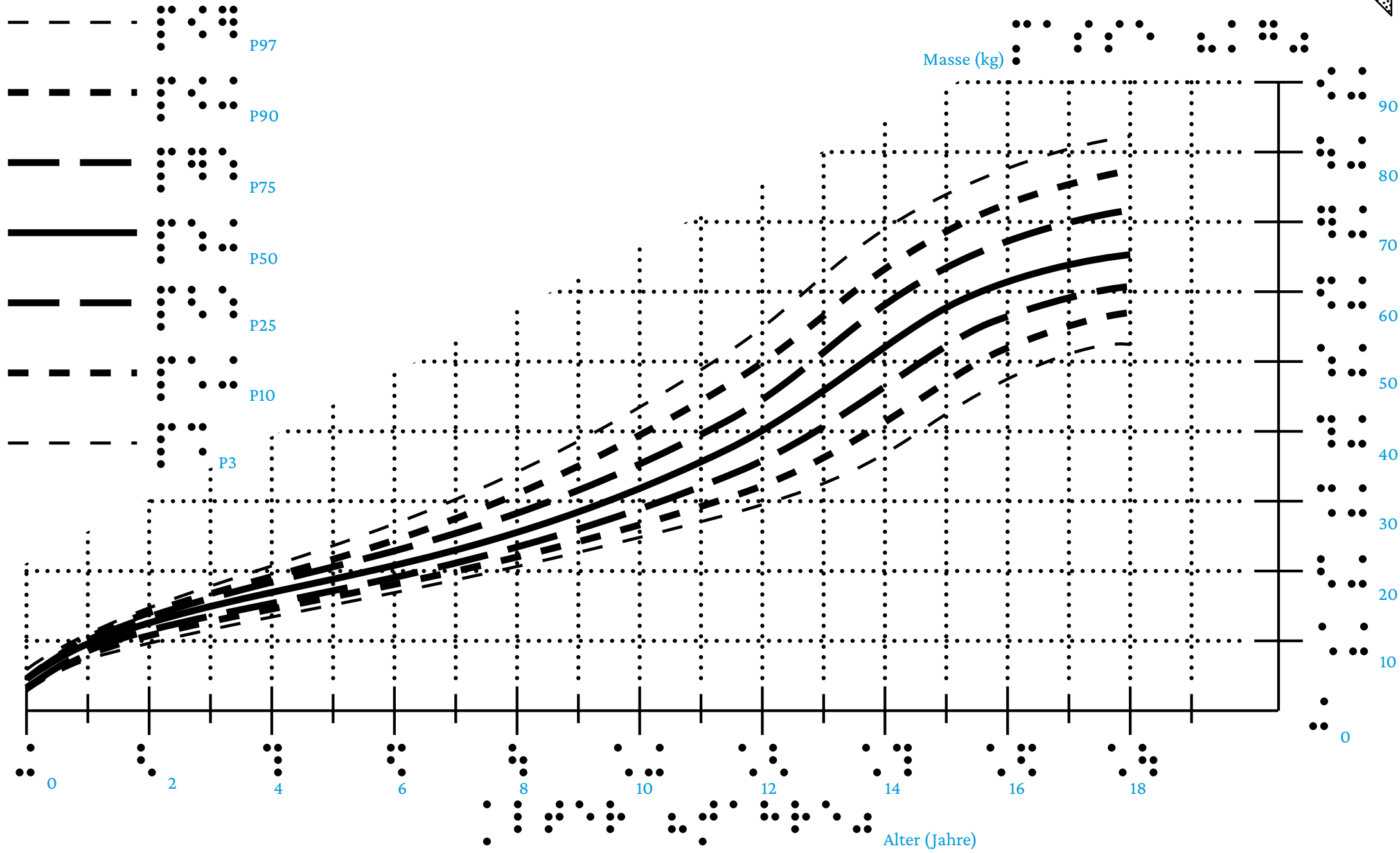
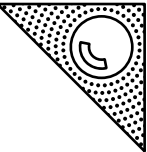
(4)

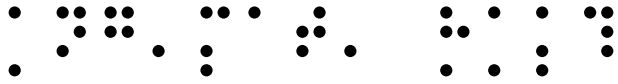
y



Ang.Mat. HAK4

S.149 6.78

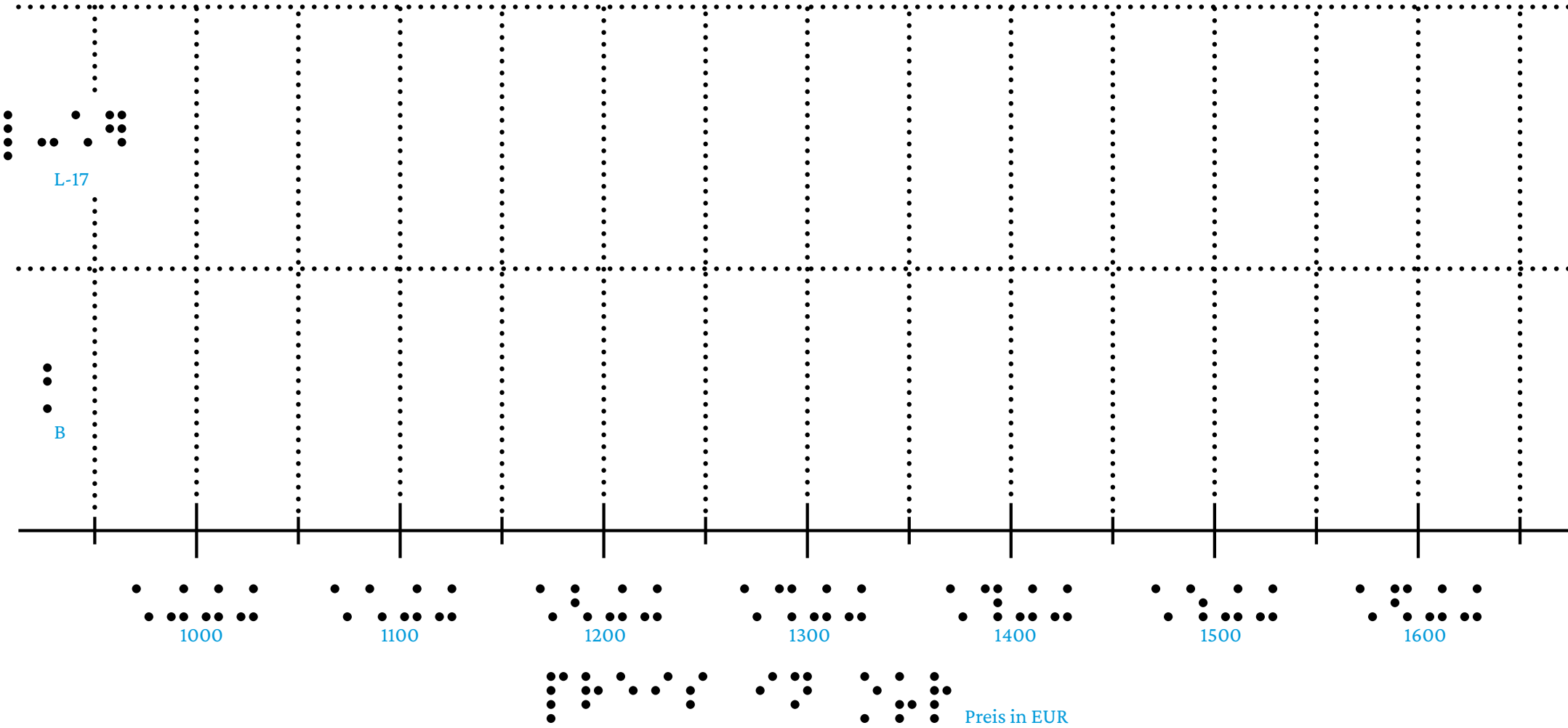
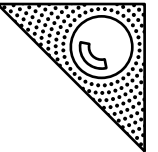


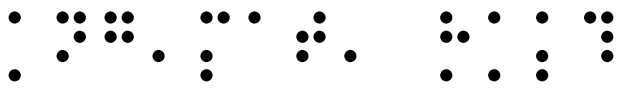


Ang.Mat. HAK4



S.150 6.80 a)

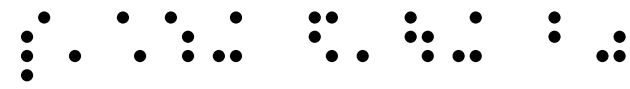
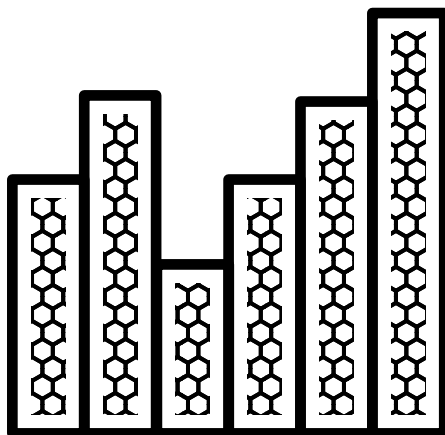




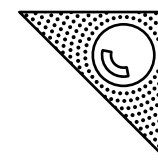
Ang.Mat. HAK4



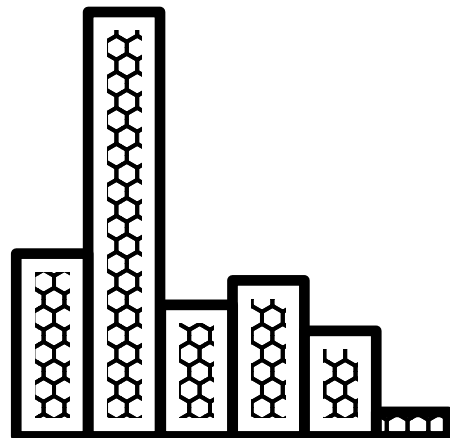
1



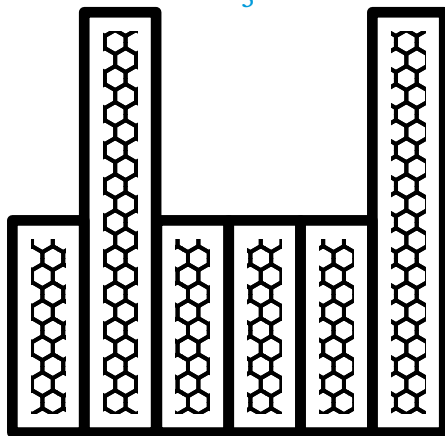
S.150 6.80 b)



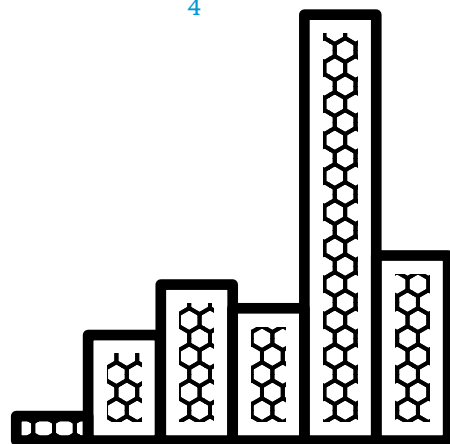
2

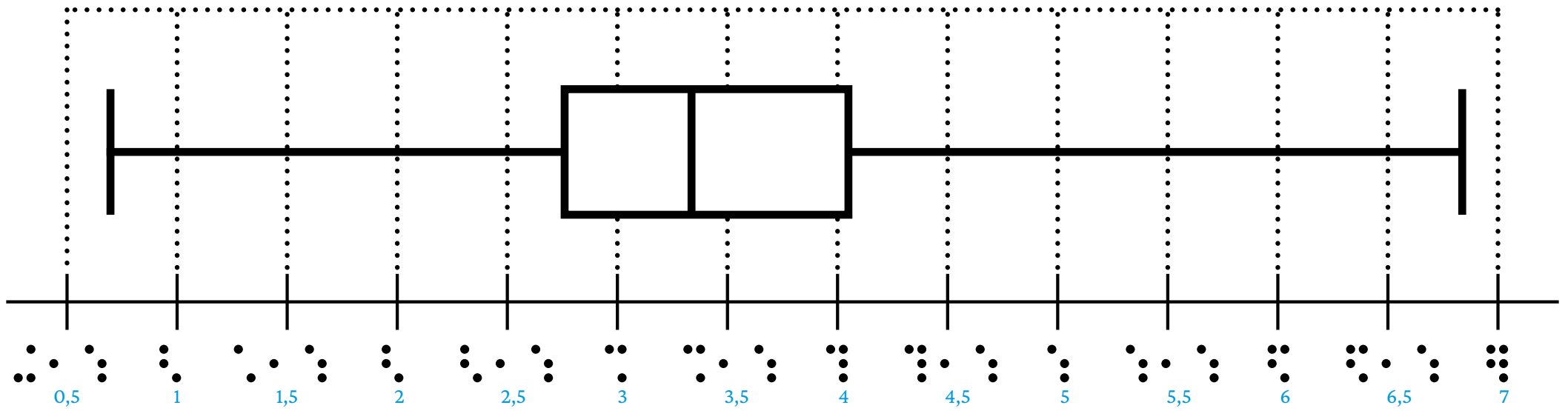
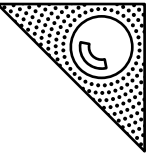
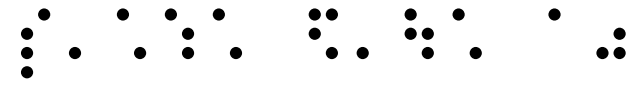
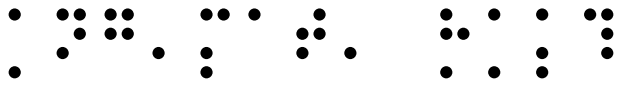


3



4

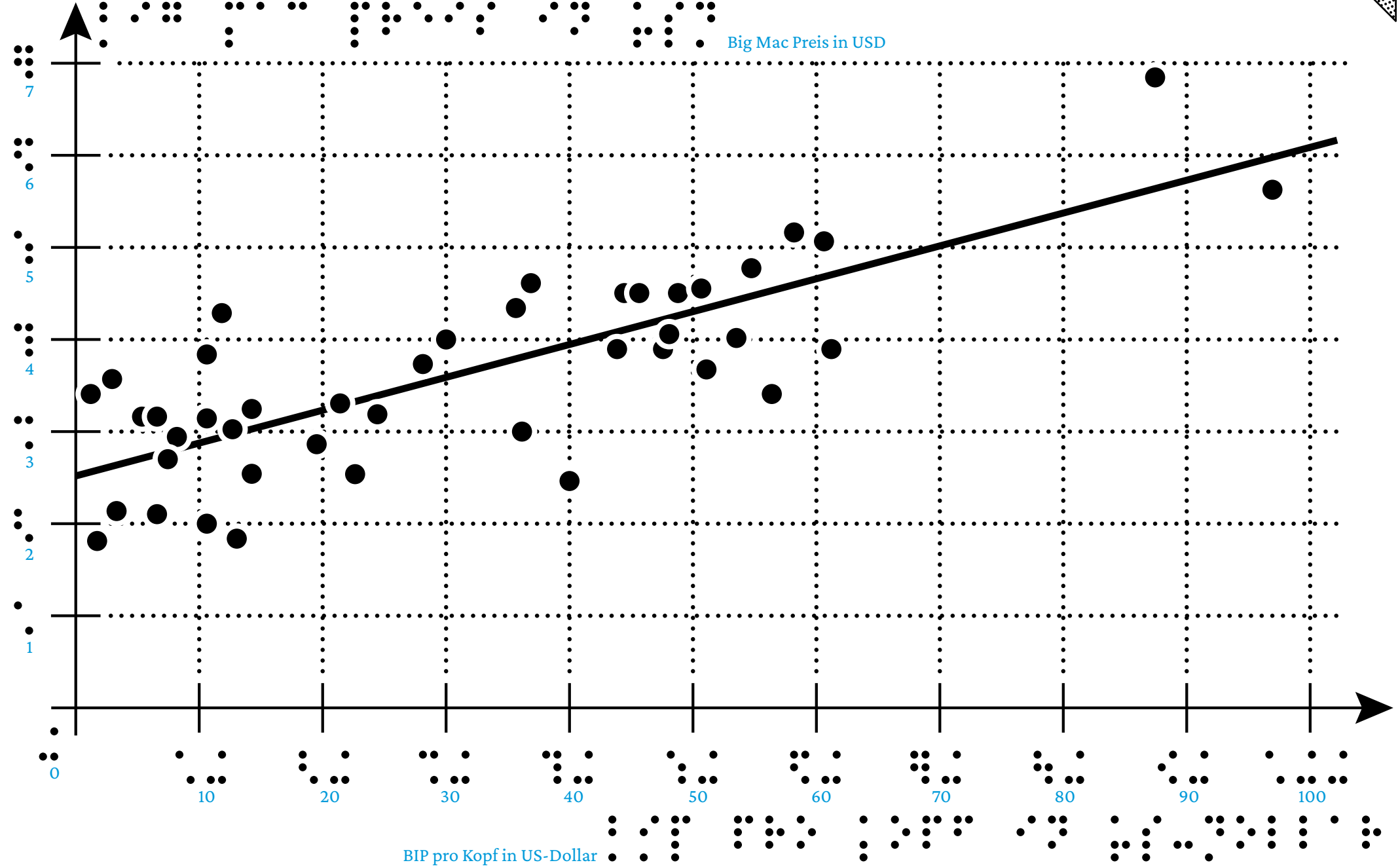
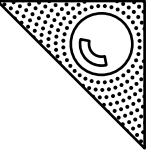


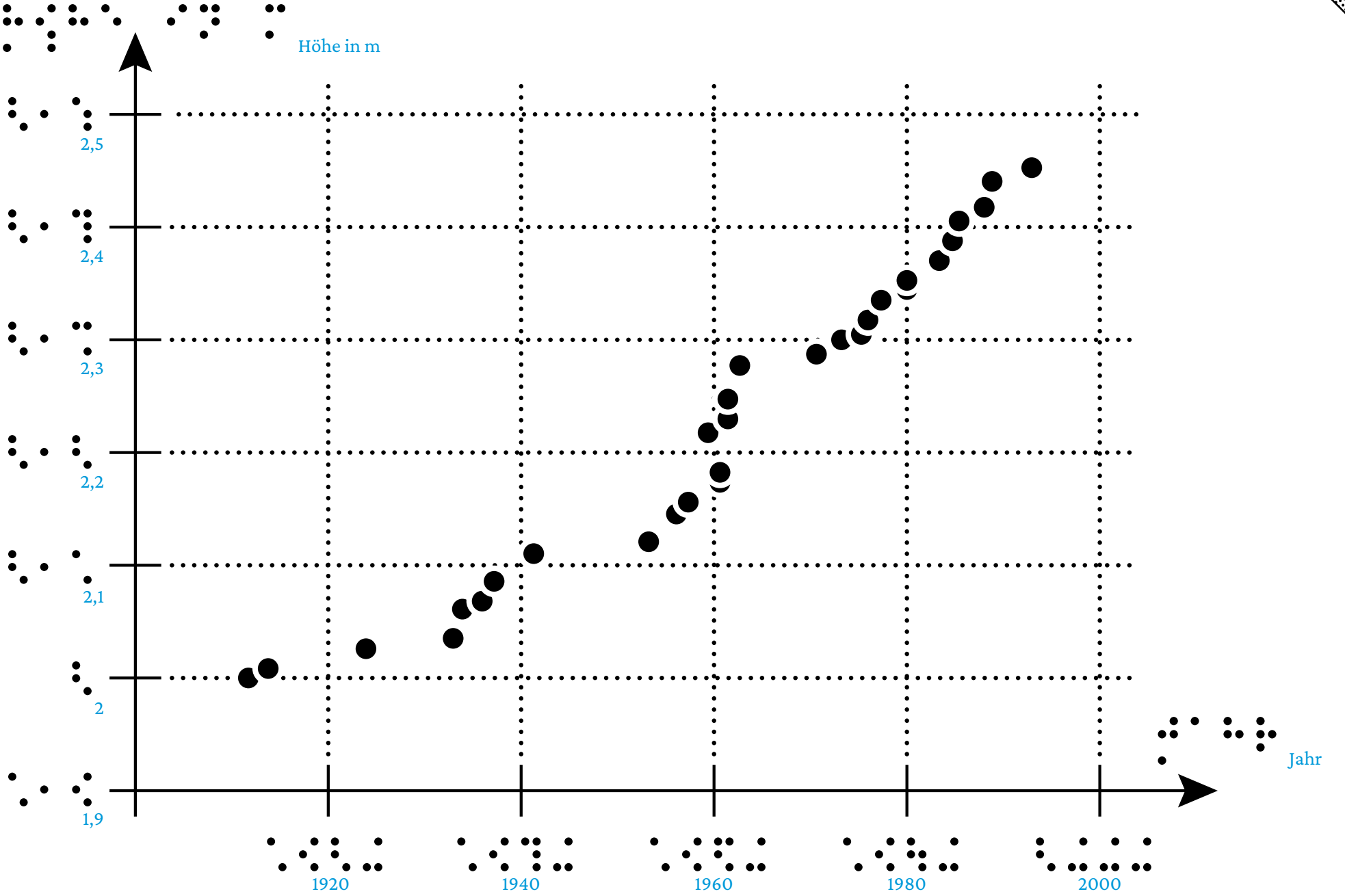
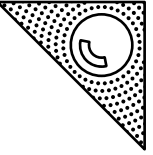


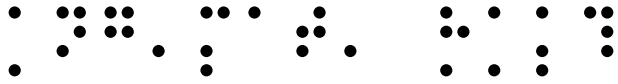
Preis eines Big Mac in US-Dollar

Ang.Mat. HAK4

S.151 6.81 b)



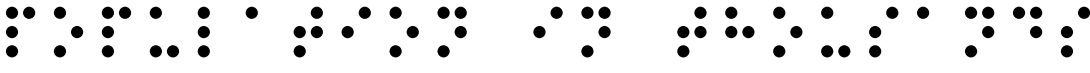
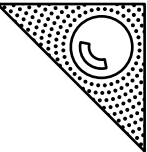




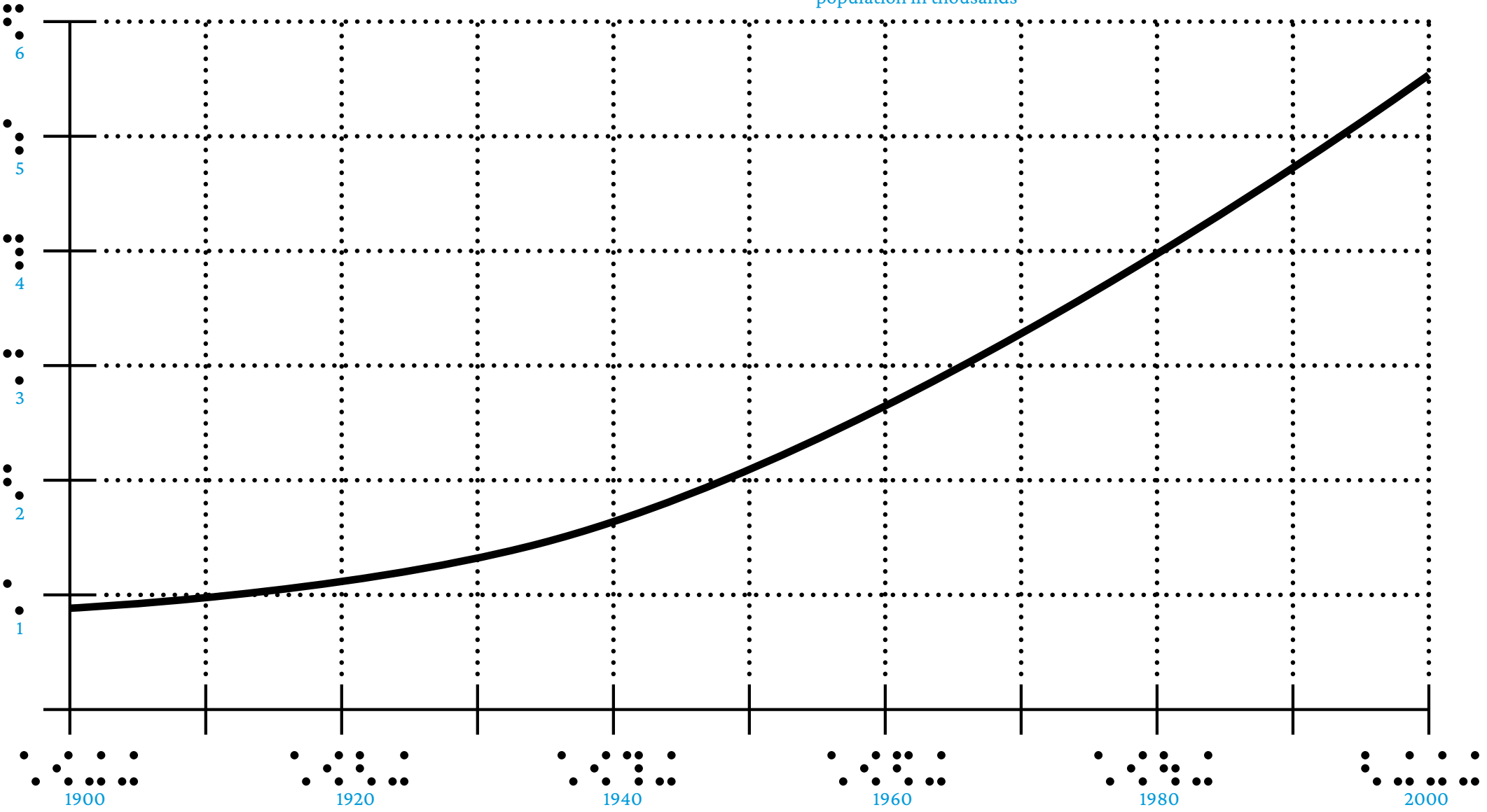
Ang.Mat. HAK4



S.152 6.84



population in thousands



1900

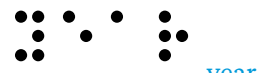
1920

1940

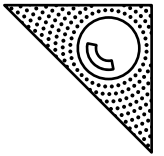
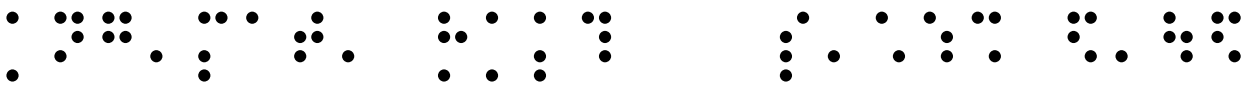
1960

1980

2000



year



a)



h)

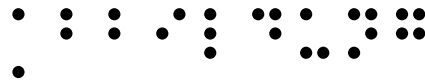


Abbildung 1

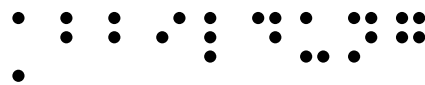
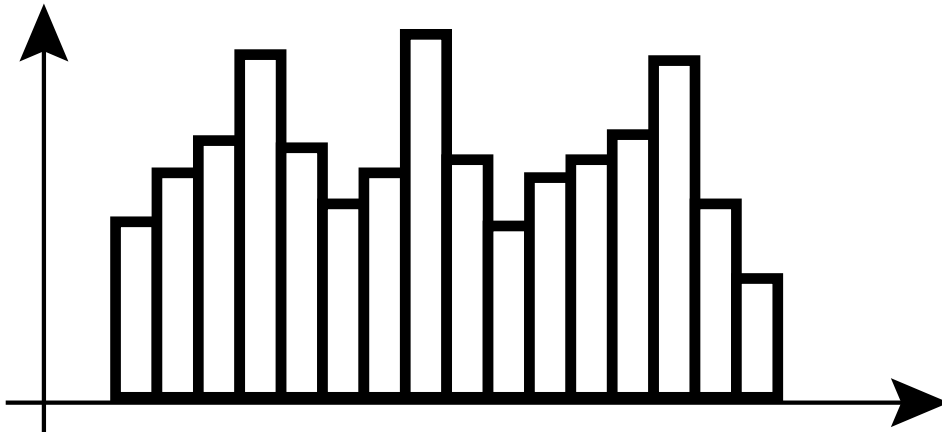
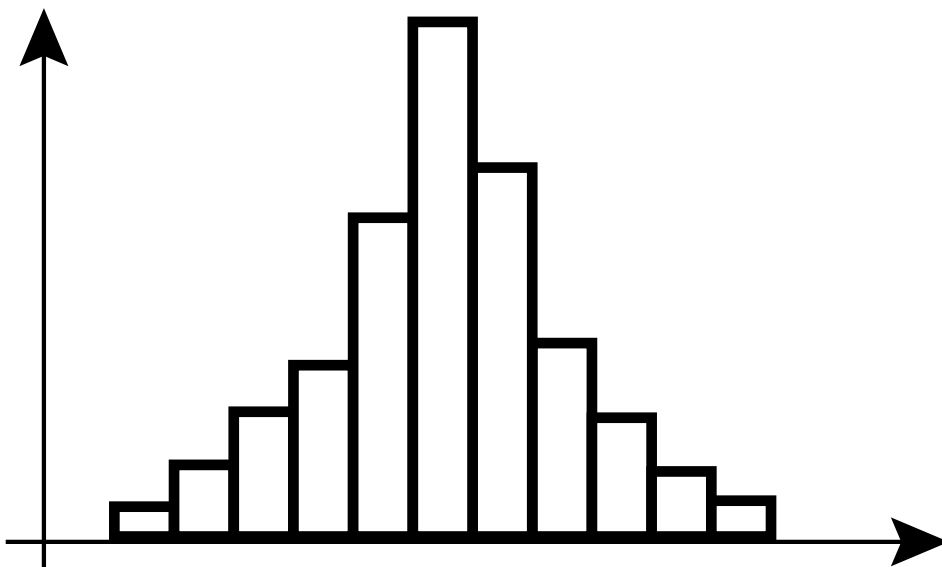
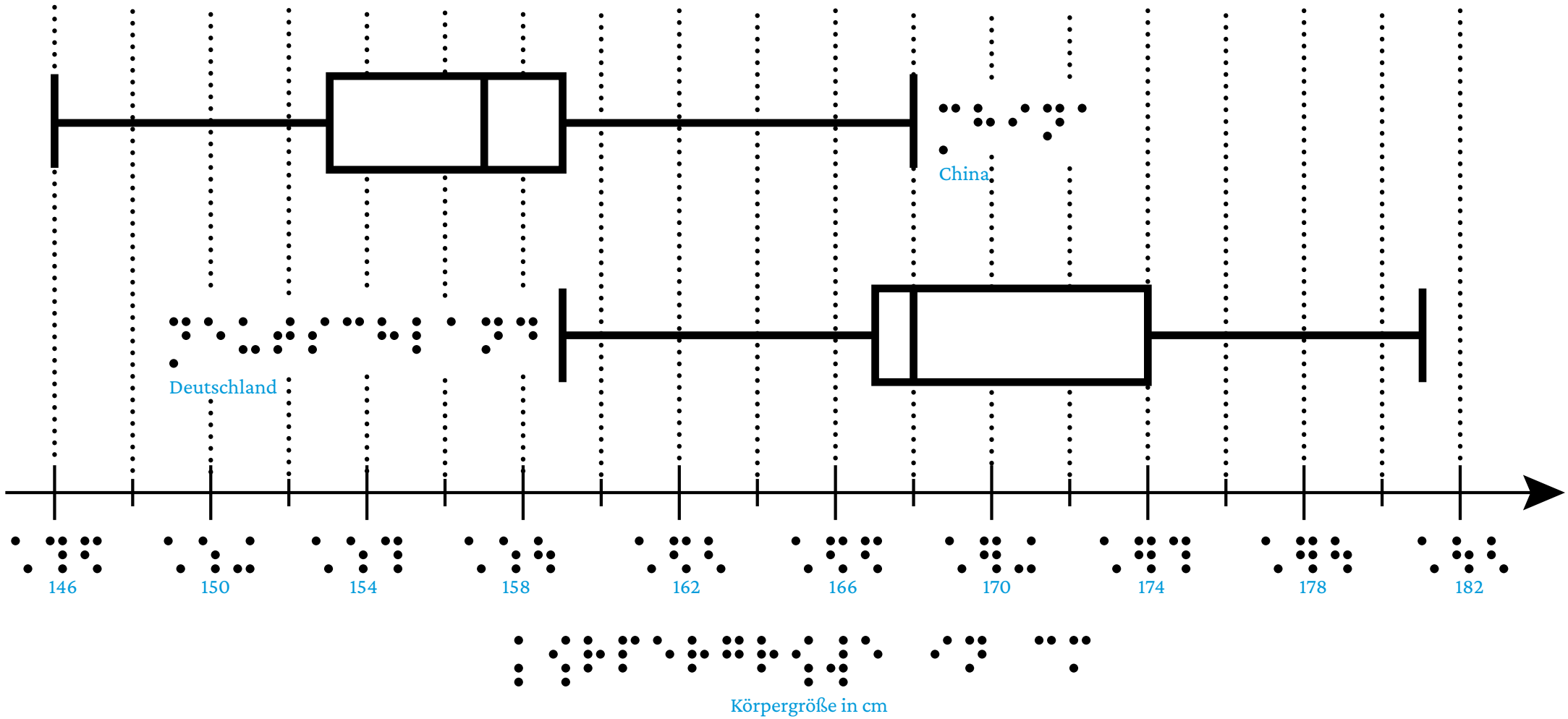
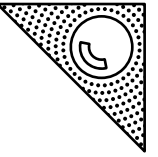
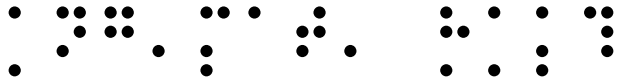
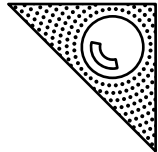
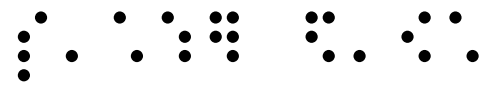
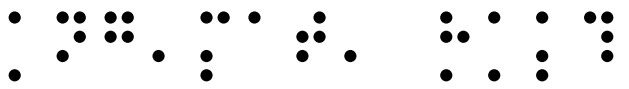


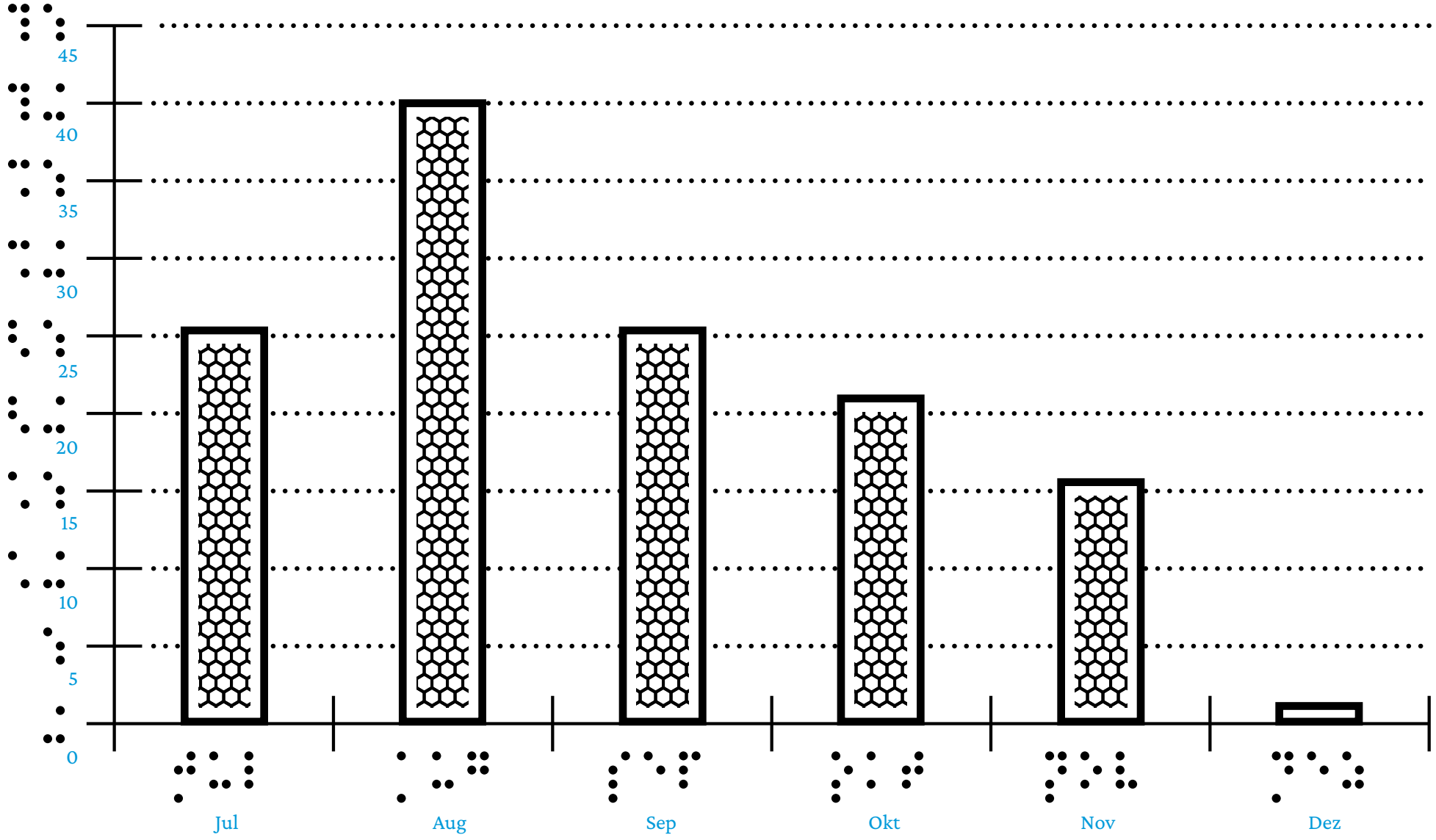
Abbildung 2

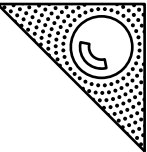






Gewinn in 1000 EUR





Platzierung

$r = -0,9595$

