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Hergestellt von der Abteilung für Inklusion und Lehrmittel (LMZ)
am Bundes-Blindeninstitut Wien

Grafikkatalog
9. Schulstufe (5. AHS)

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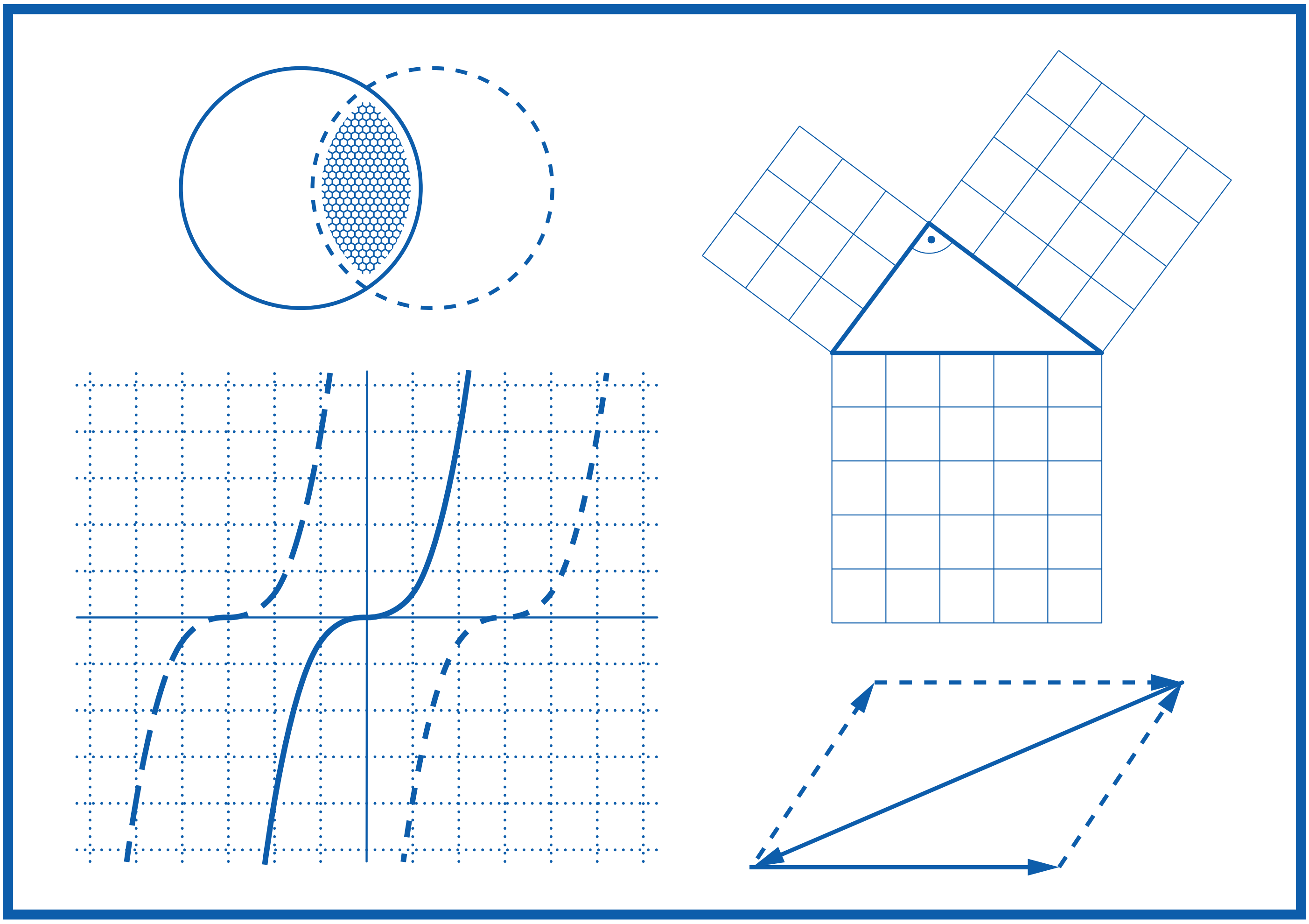

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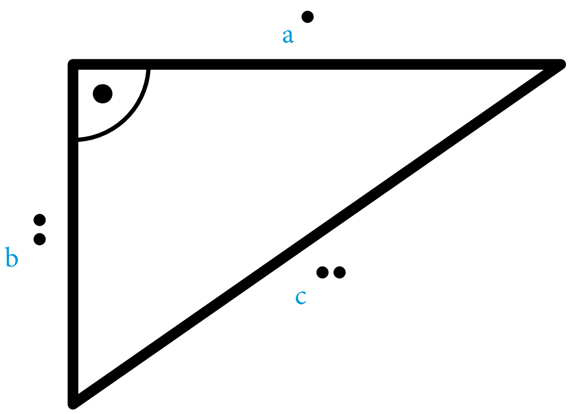
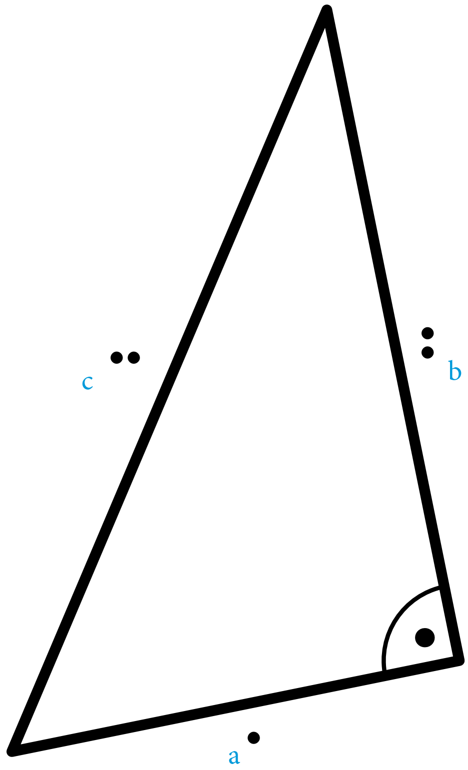
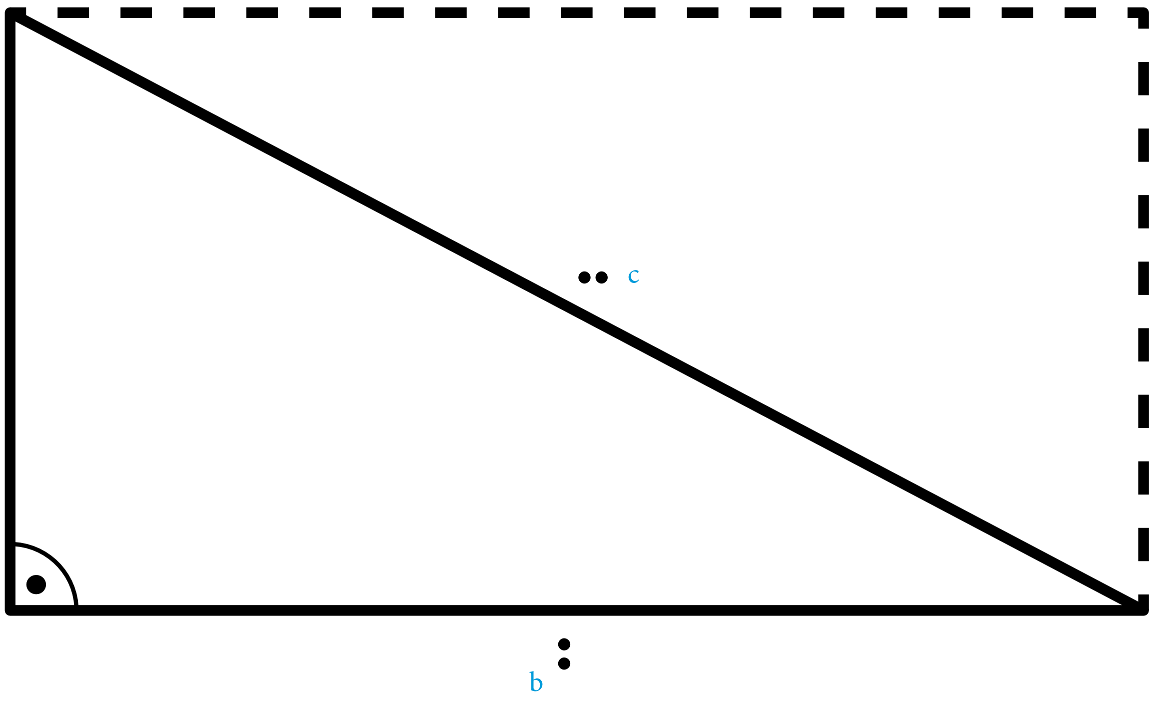
PL im rechtwinkligen Dreieck

c: Hypotenuse

a, b: Katheten



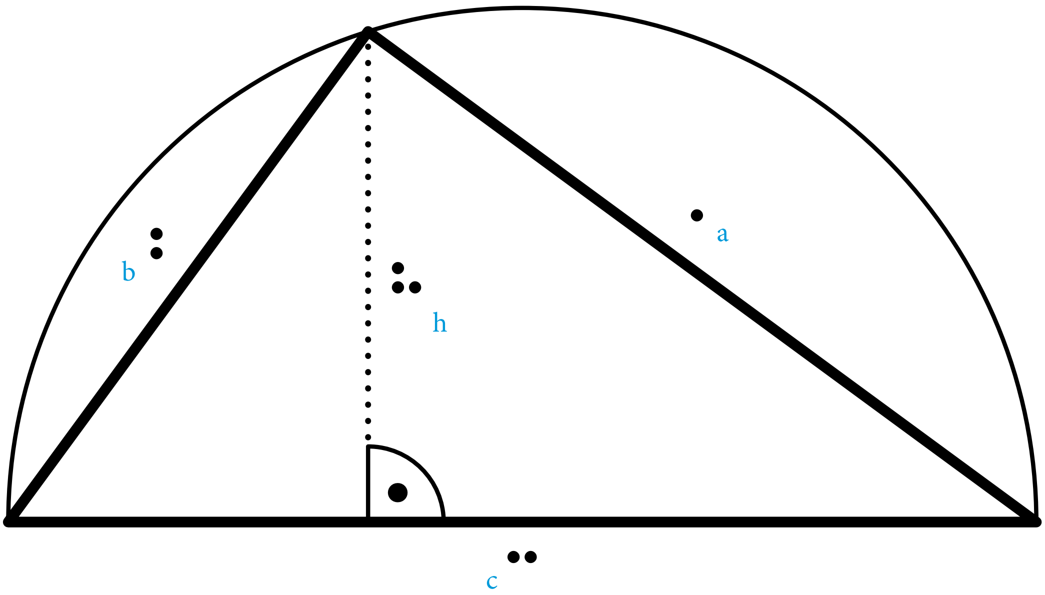


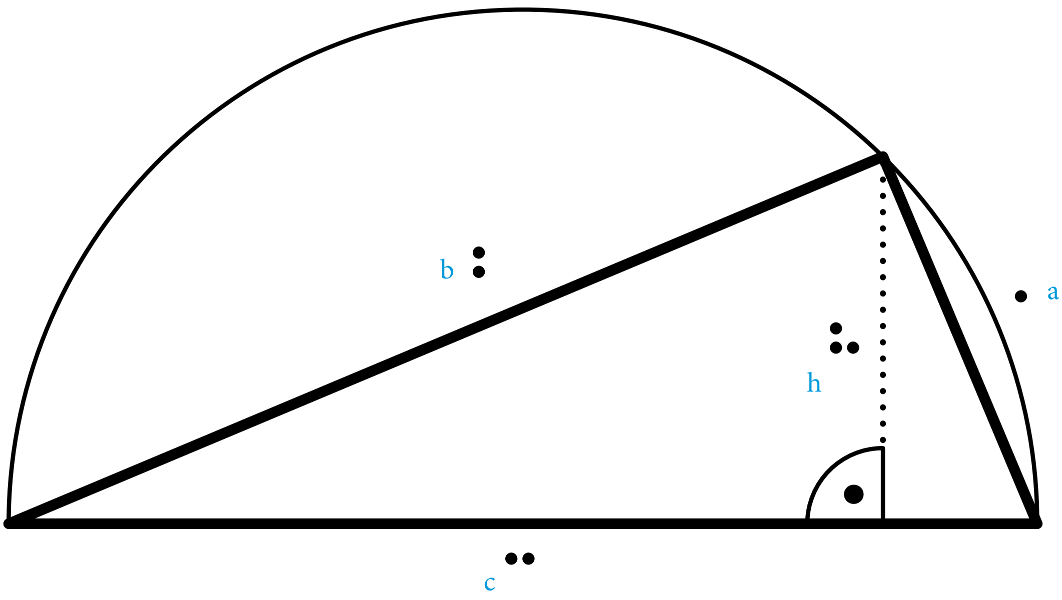


PL im rechtwinkligen Dreieck mit Thaleskreis

a, b: Katheten, c: Hypotenuse

h: Höhe auf die Hypotenuse





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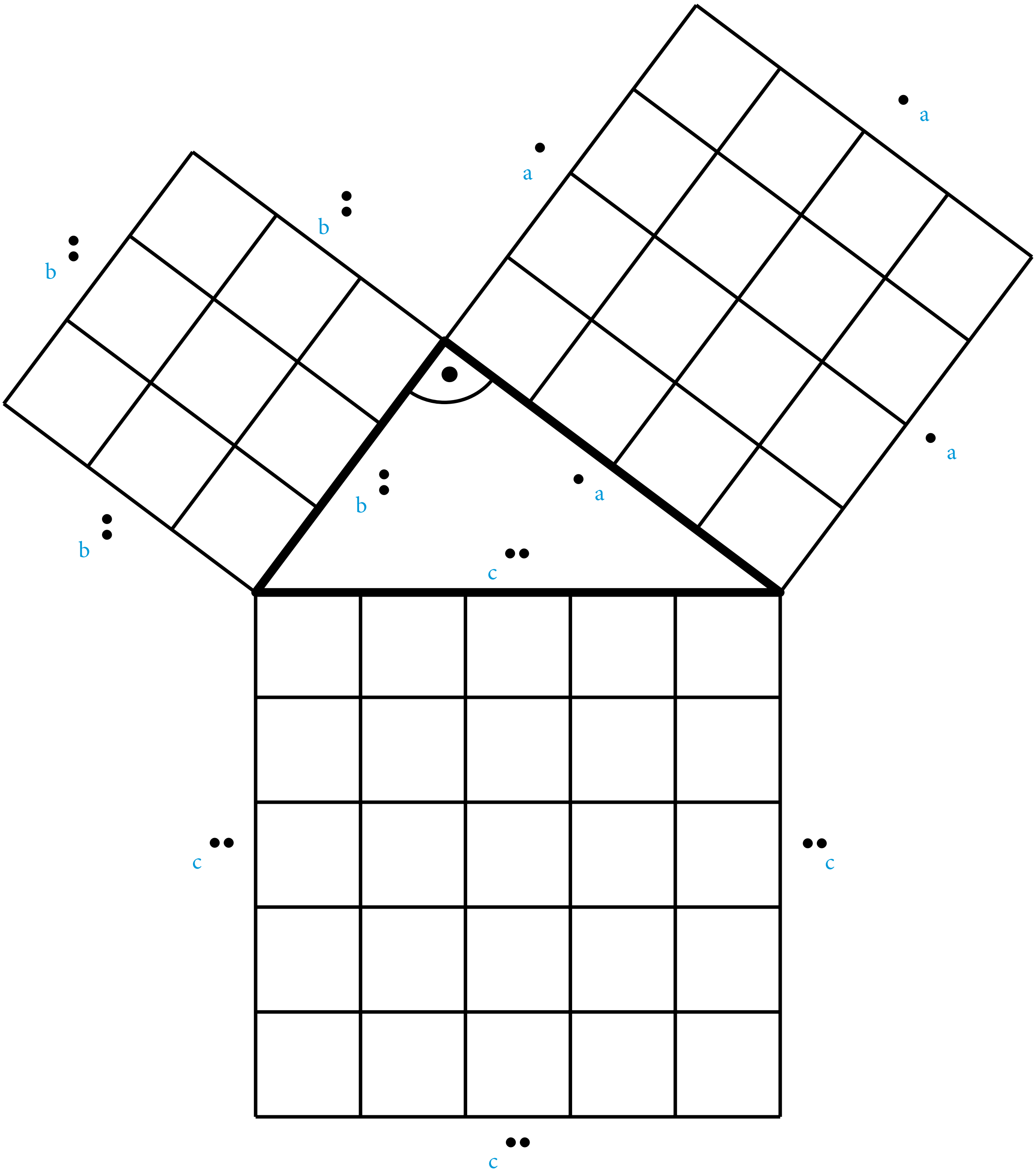
Pythagoräischer Lehrsatz

a^2 +b^2 =c^2

a, b: Katheten, c: Hypotenuse



St 09 PL, 4/17

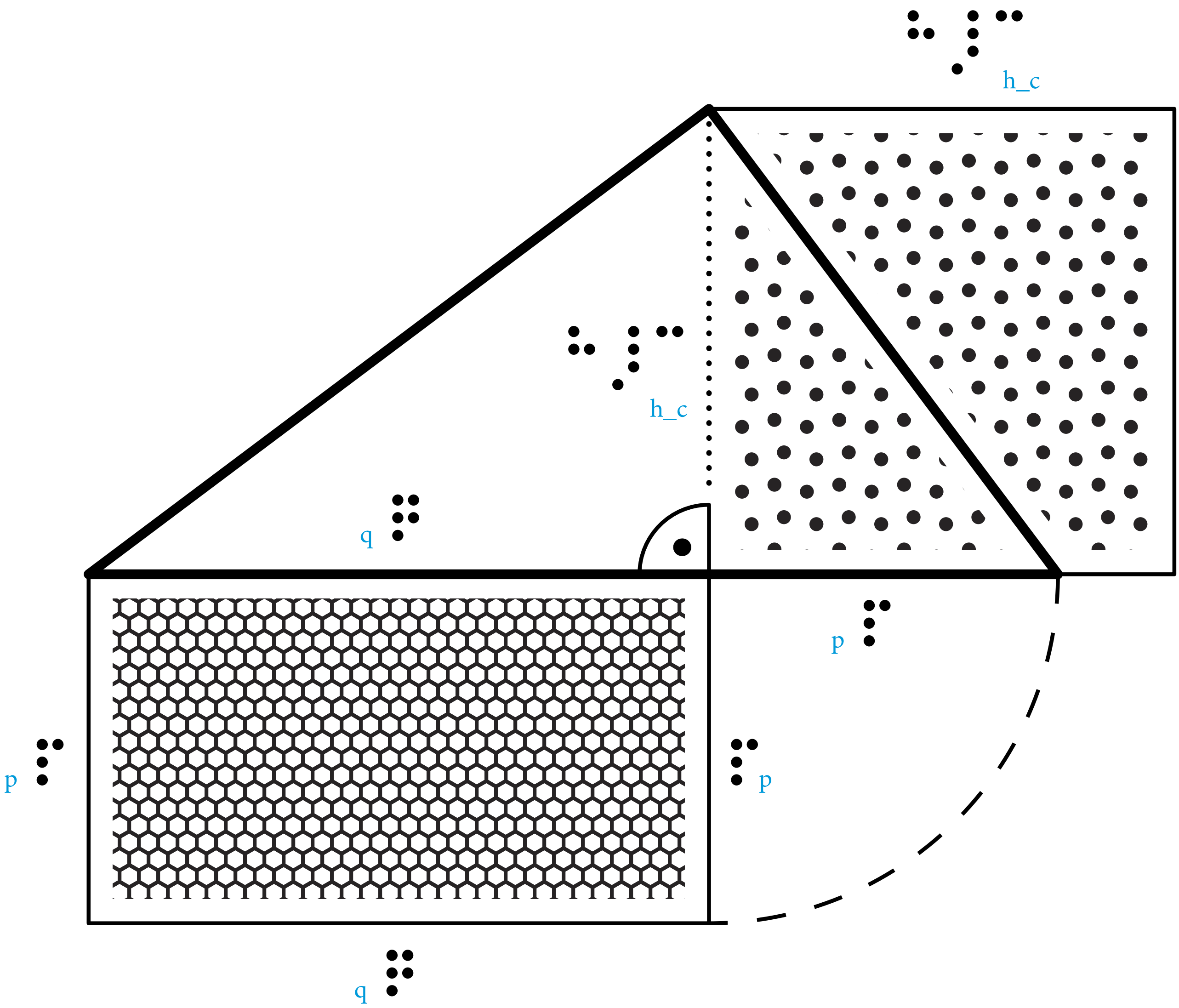
PL Höhensatz

Hypotenuse c =q +p

h_c / q =p / h_c | *q; *h_c

daraus folgt: h_c^2 =p *q

h_c^2: p *q:



Kathetensatz_1

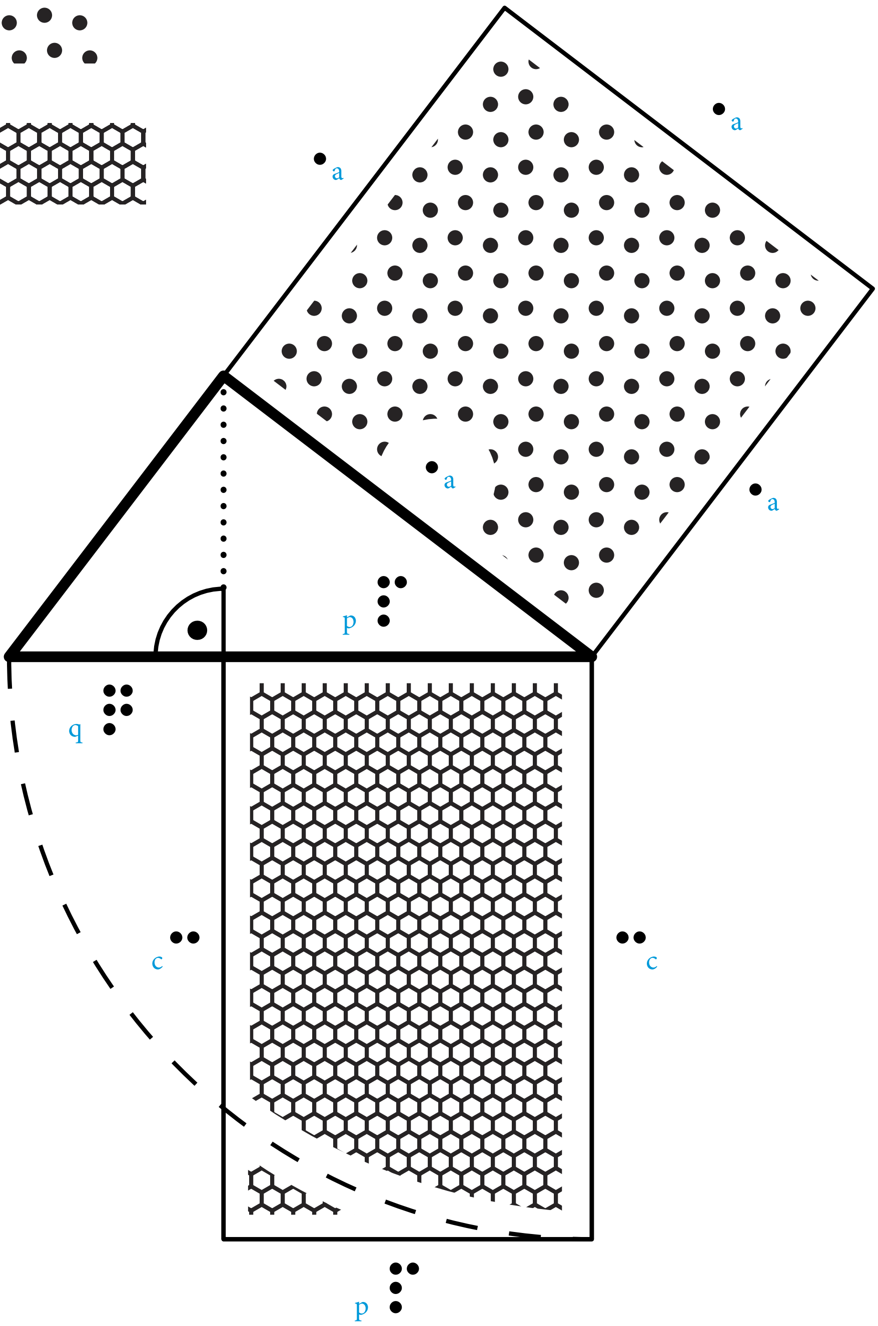
Hypotenuse c =q +p

a / p =c / a | *a; *p

daraus folgt: a^2 =p *c

a^2:

p *c:



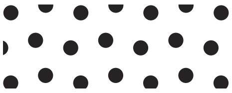
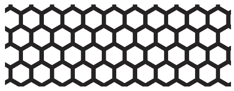
St 09 PL, 6/17

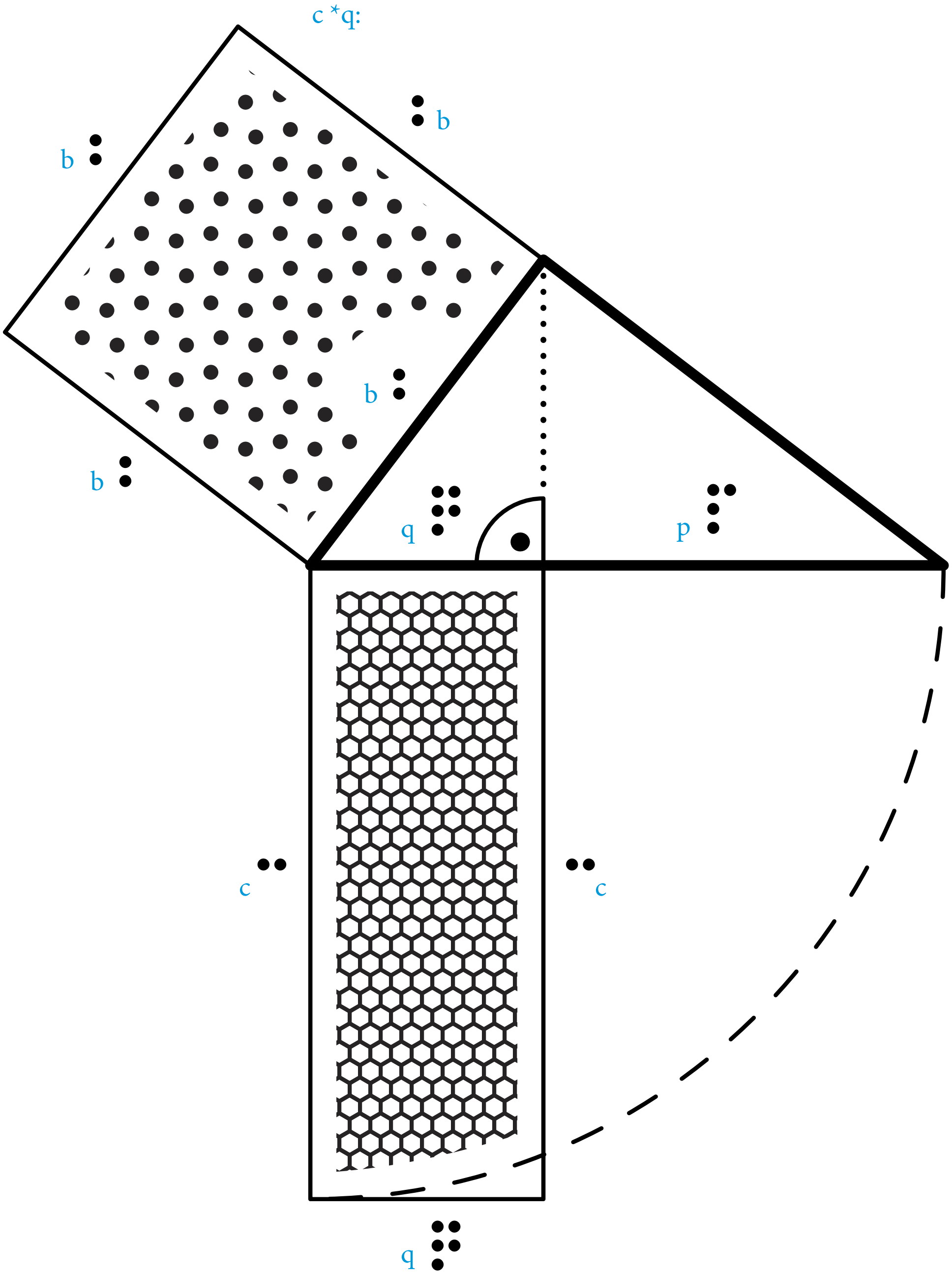
Kathetensatz_2

Hypotenuse c =q +p

b / q =c / b | *b; *q

daraus folgt: b^2 =c *q

b^2:  c *q: 

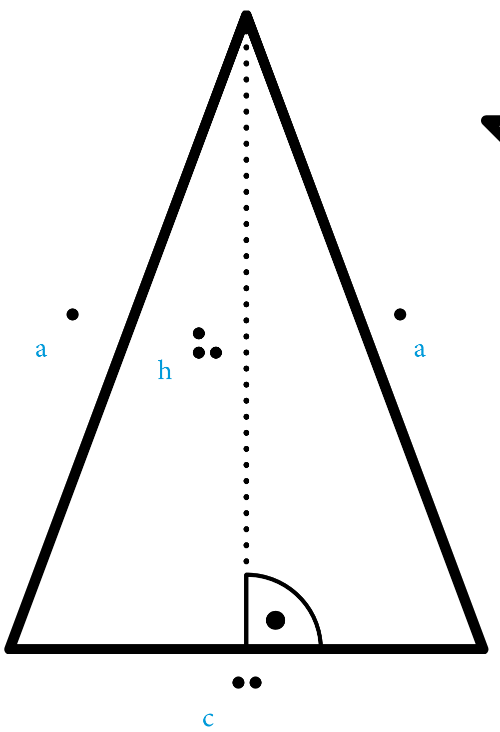


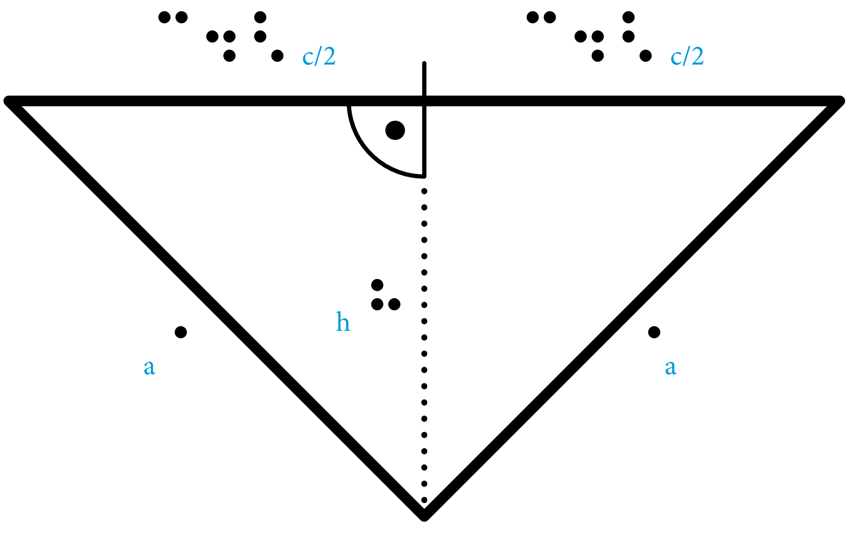
PL im gleichschenkligen Dreieck

c/2: Hälfte der Basislänge

a: Schenkel

h: Höhe auf Basis c

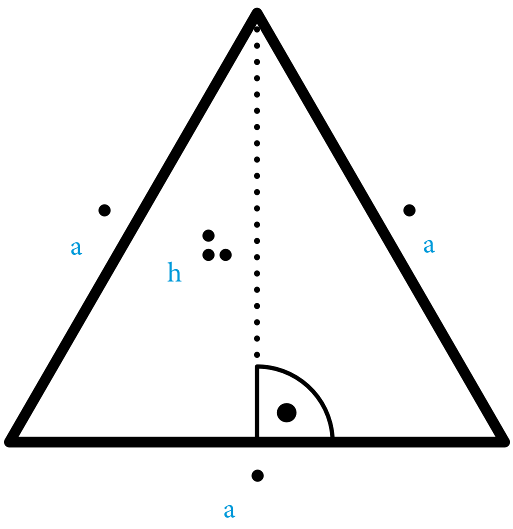


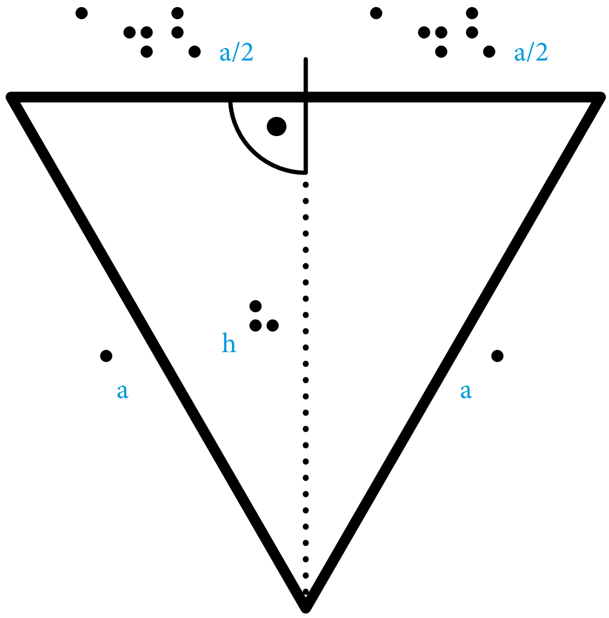


PL im gleichseitigen Dreieck

a: Seitenlänge

h: Höhe auf a

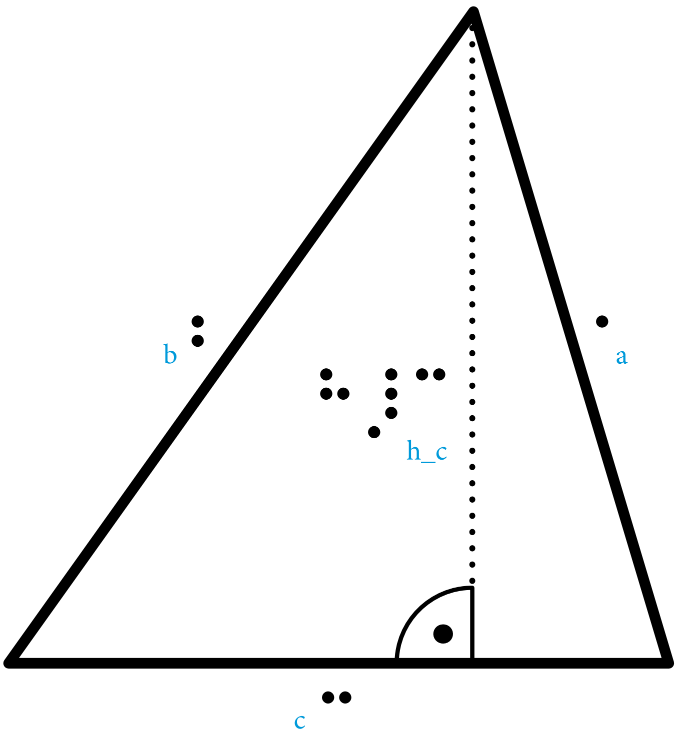


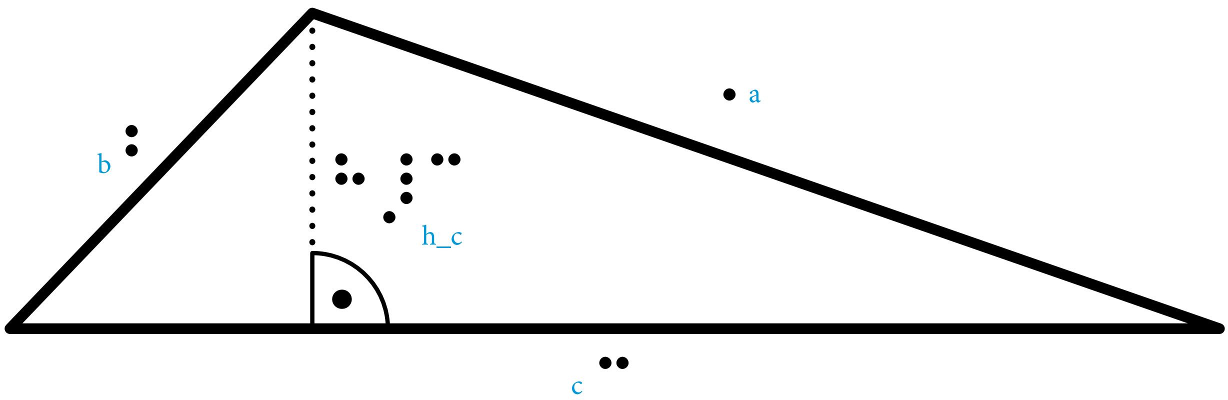


PL im allgemeinen Dreieck

a, b, c: Seiten

h_c: Höhe auf c

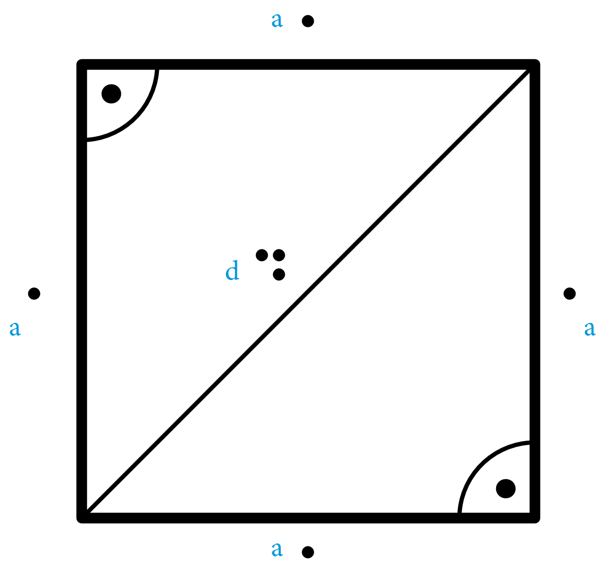


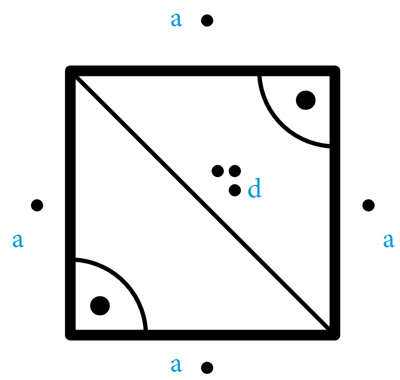


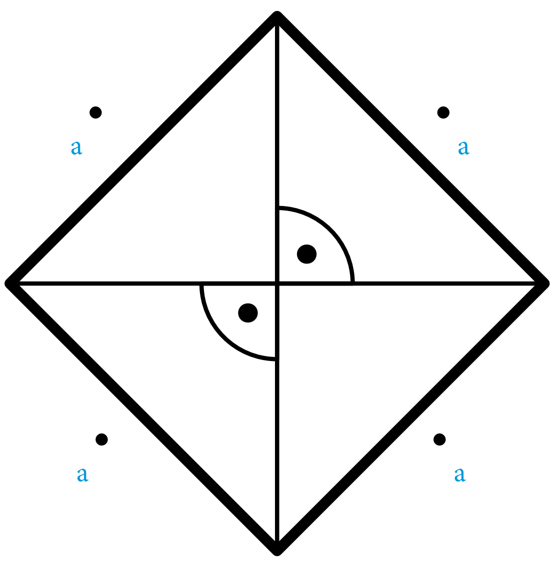
PL im Quadrat

a: Seite

d: Diagonale





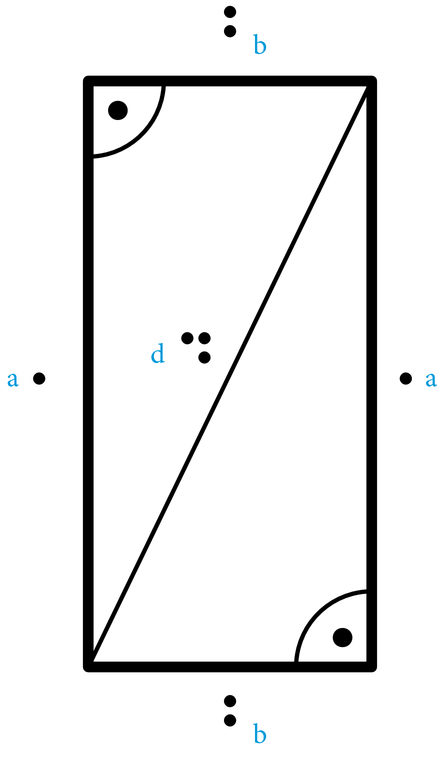


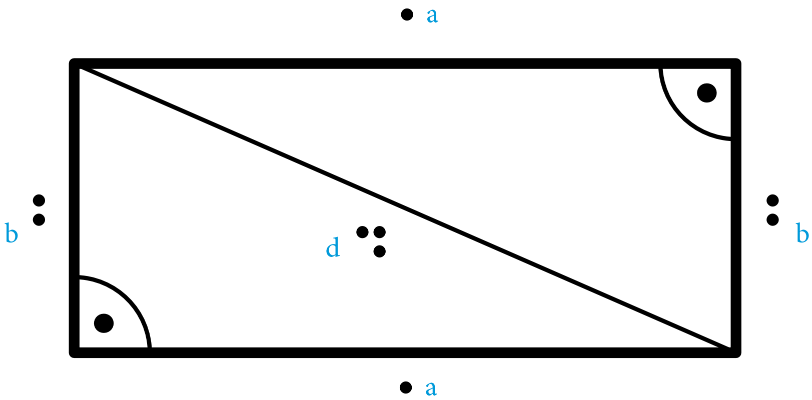
PL im Rechteck

a: Länge

b: Breite

d: Diagonale



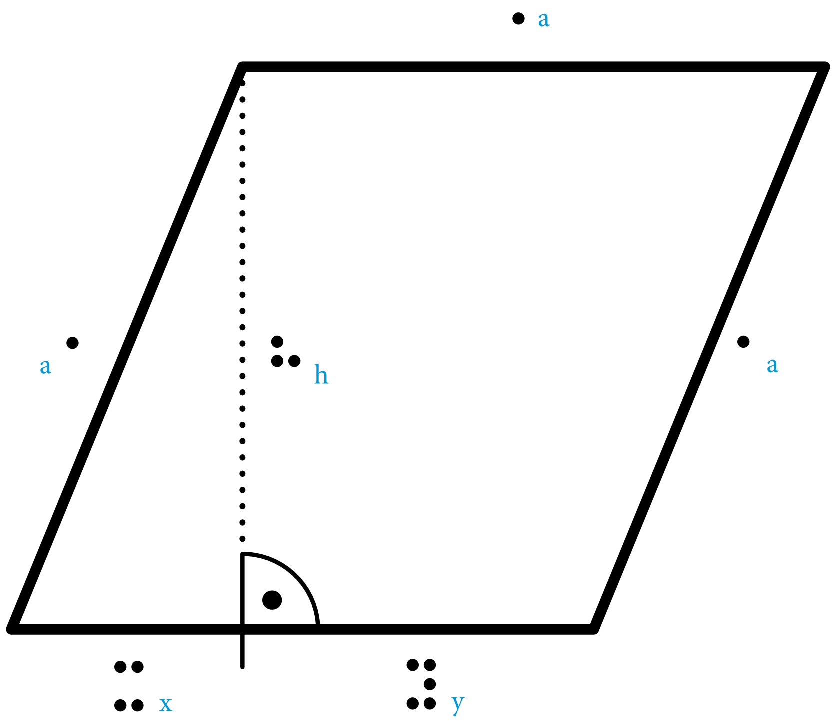


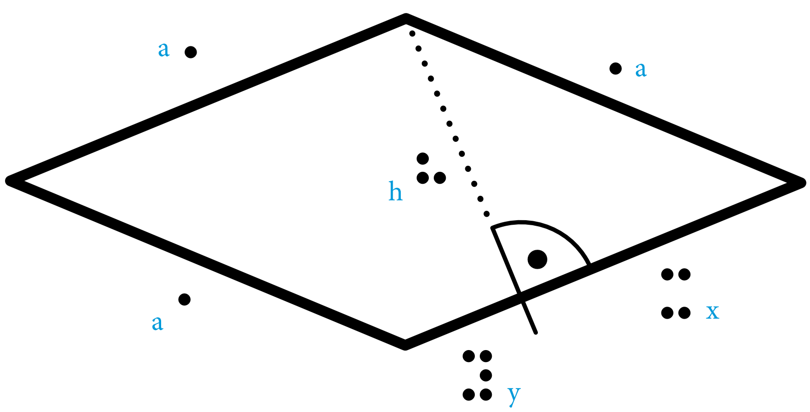
PL in der Raute

a: Seite

h: Höhe auf a

x +y =a



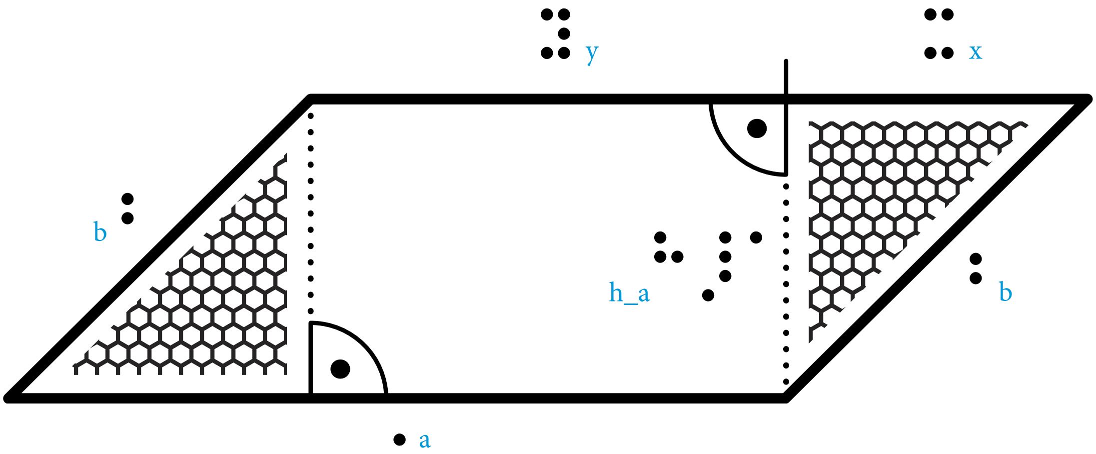


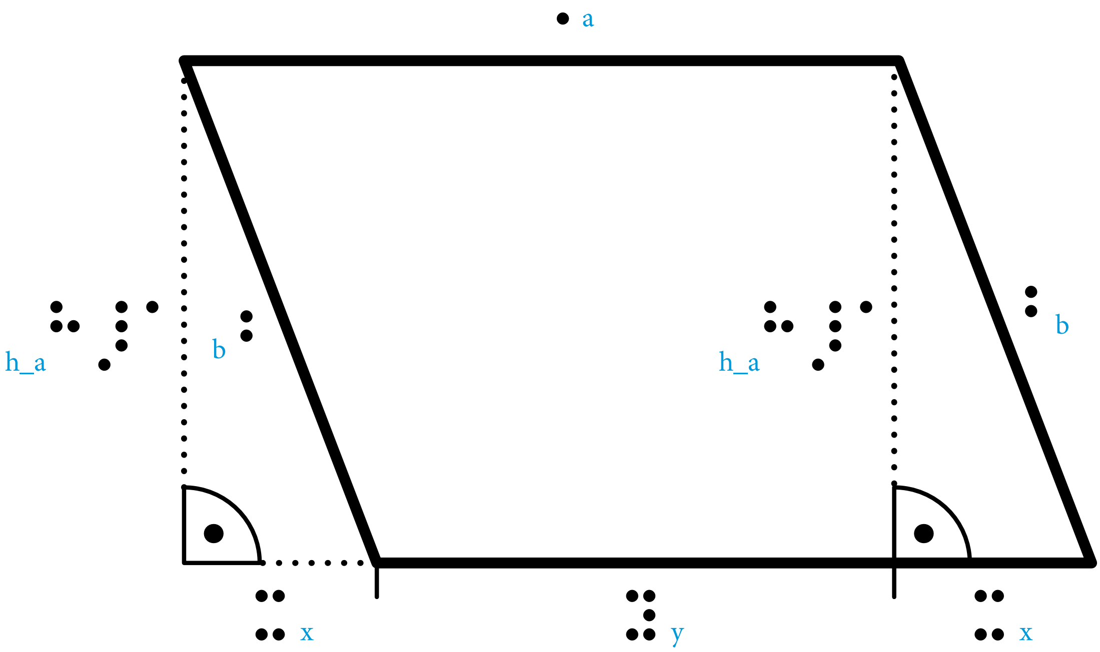
PL im Parallelogram

a, b: Seiten

h_a: Höhe auf a

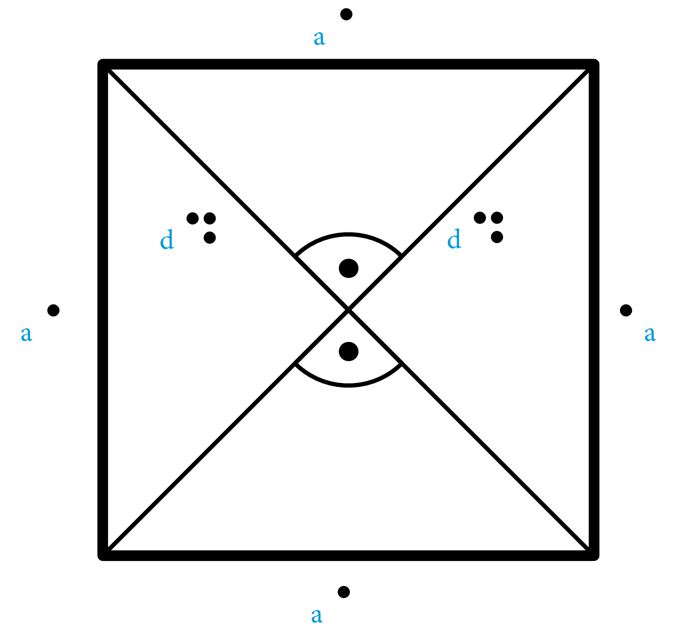
x +y =a

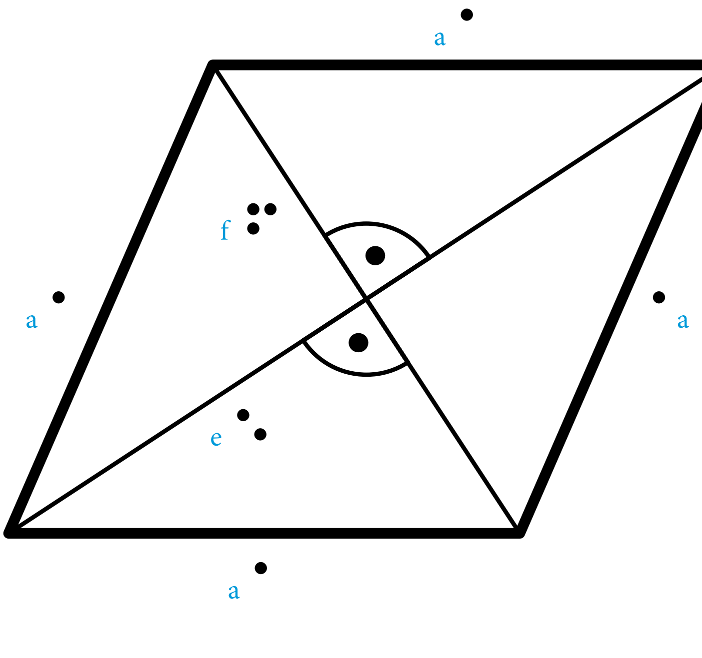




PL Diagonalen normal

Quadrat und Raute: Diagonalen halbieren einander



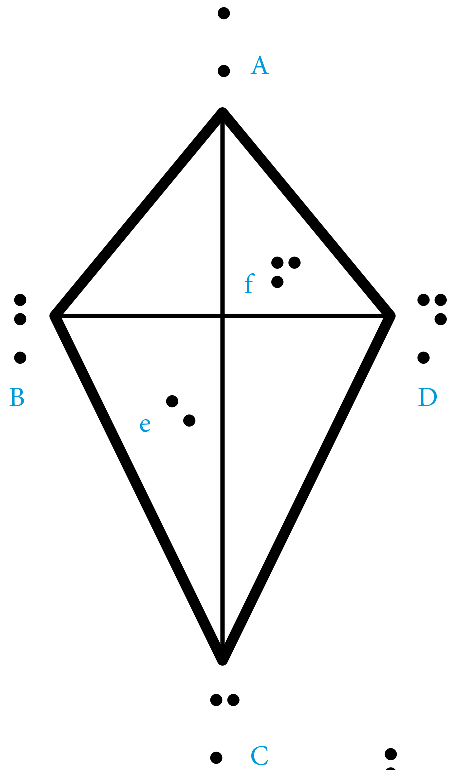


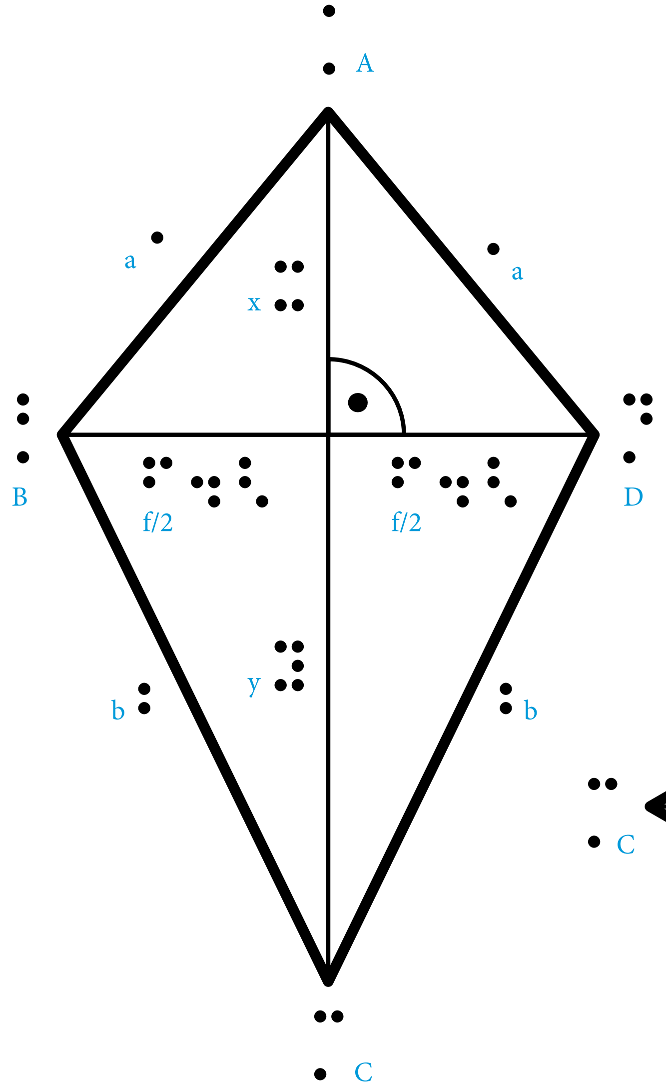
PL Diagonalen normal

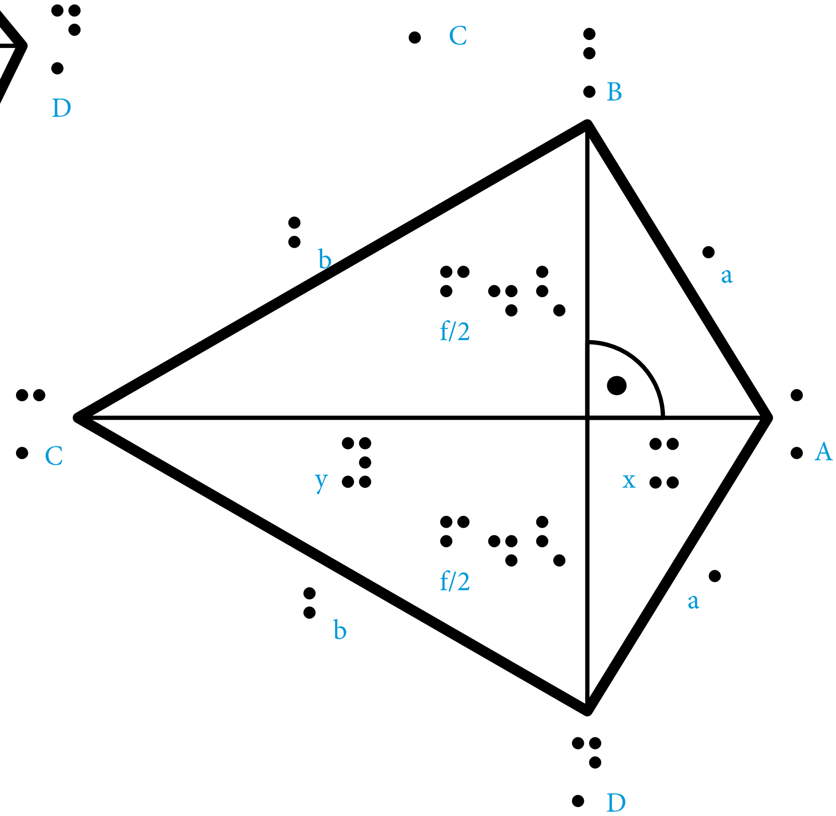
Deltoid: Diagonale e halbiert Diagonale f

$|AC| = e$, $|BD| = f$

$e = x + y$







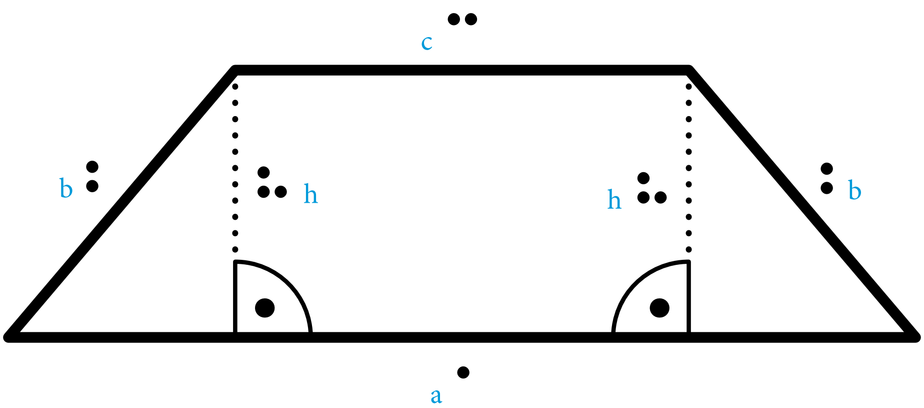
PL im gleichschenkligen Trapez

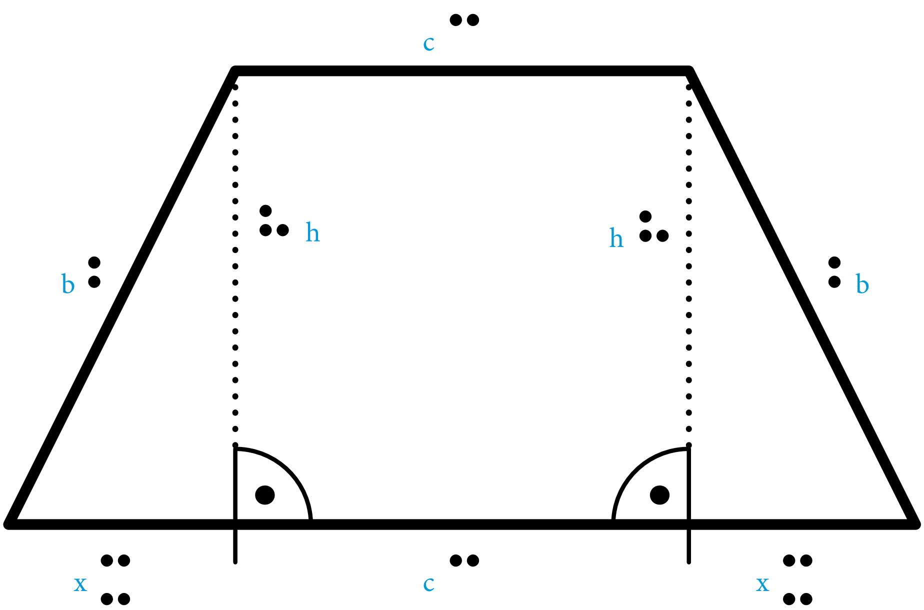
a, c: parallele Seiten

b: Schenkel

h: Höhe auf a

a =x +c +x





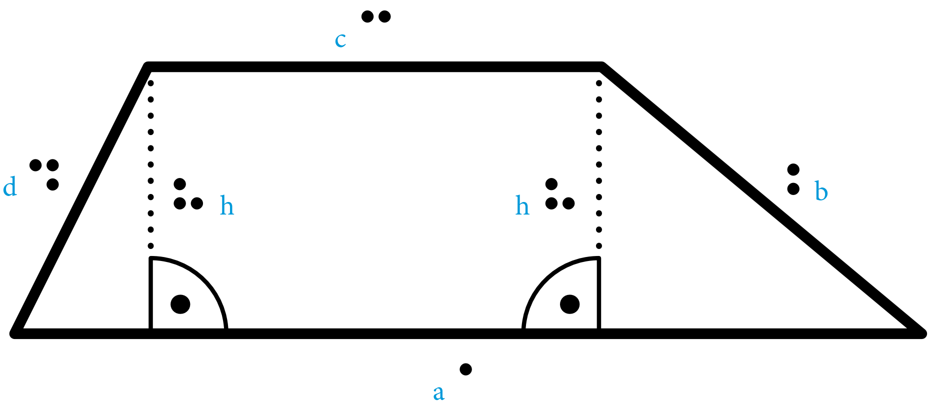
PL im Trapez

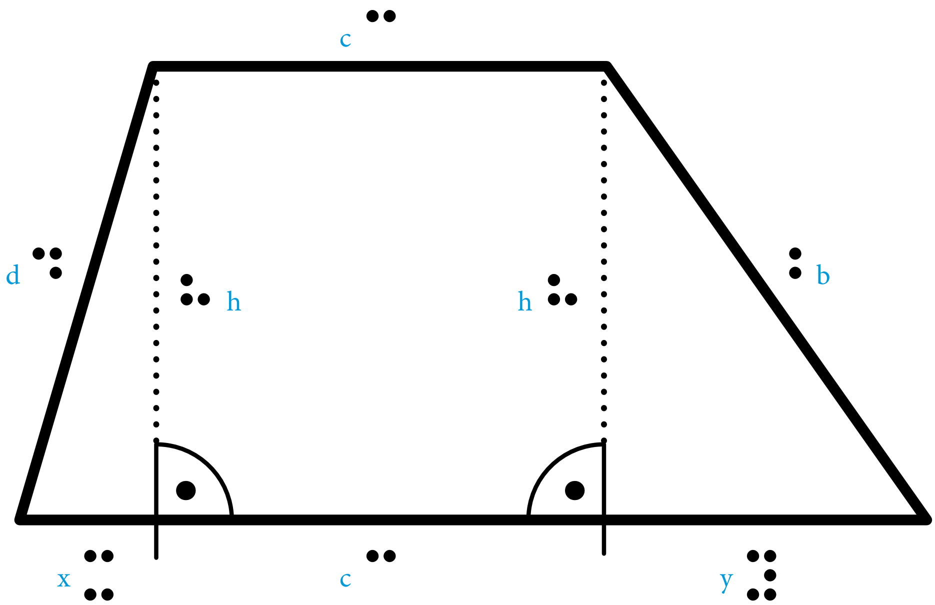
a, c: parallele Seiten

b, d: Schenkel

h: Höhe auf a

a =x +c +y





Mengen
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Mengen

Schulstufe 09

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3 Durchschnittsmenge ⣤DM

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⣤SD B

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11 Mengenoperationen ⡸3

12 Vier Mengen

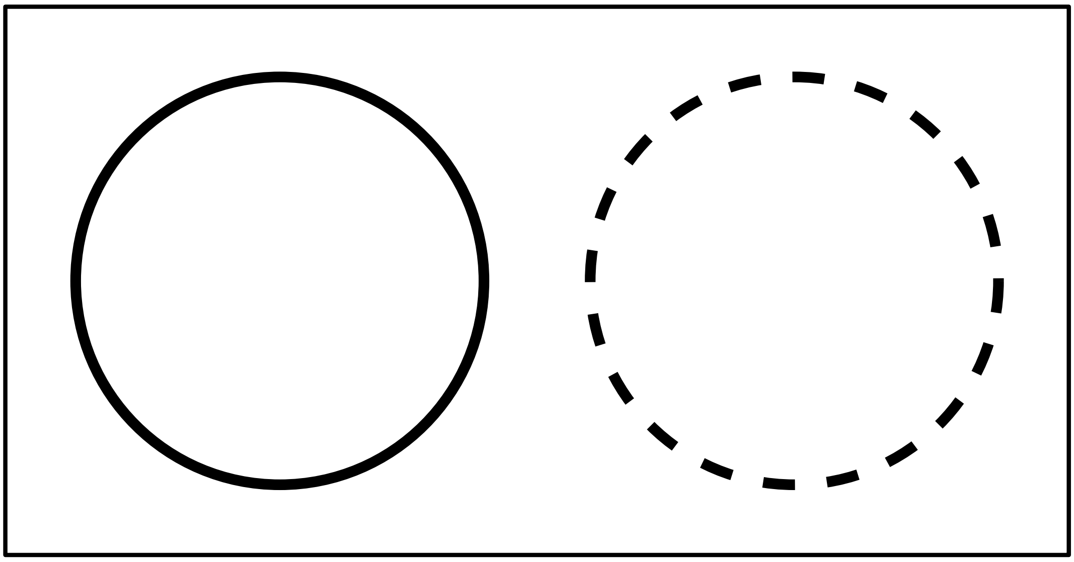
Zwei Mengen

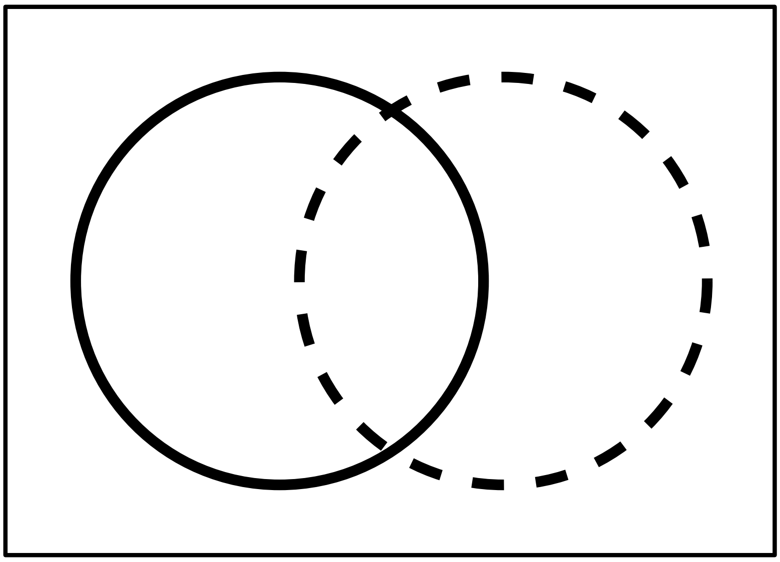
Mengen A, B in G

Grundmenge G: Rechteck

A:

B:





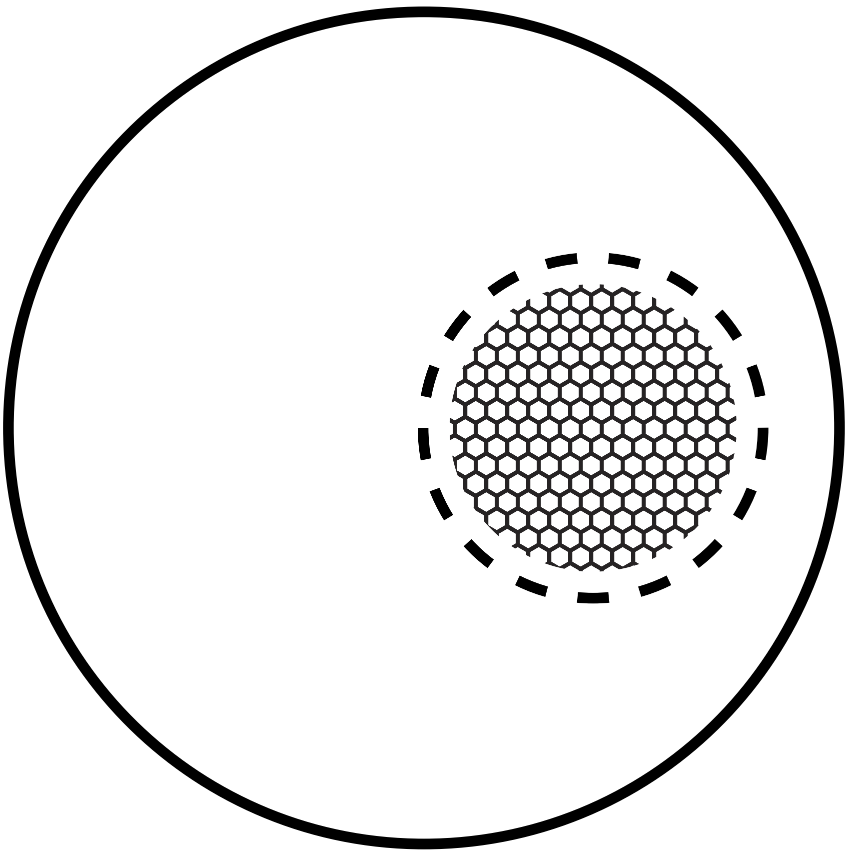
Zwei Mengen

Echte Teilmengen 'eTM

A:

B:

B 'eTM A:



Zwei Mengen

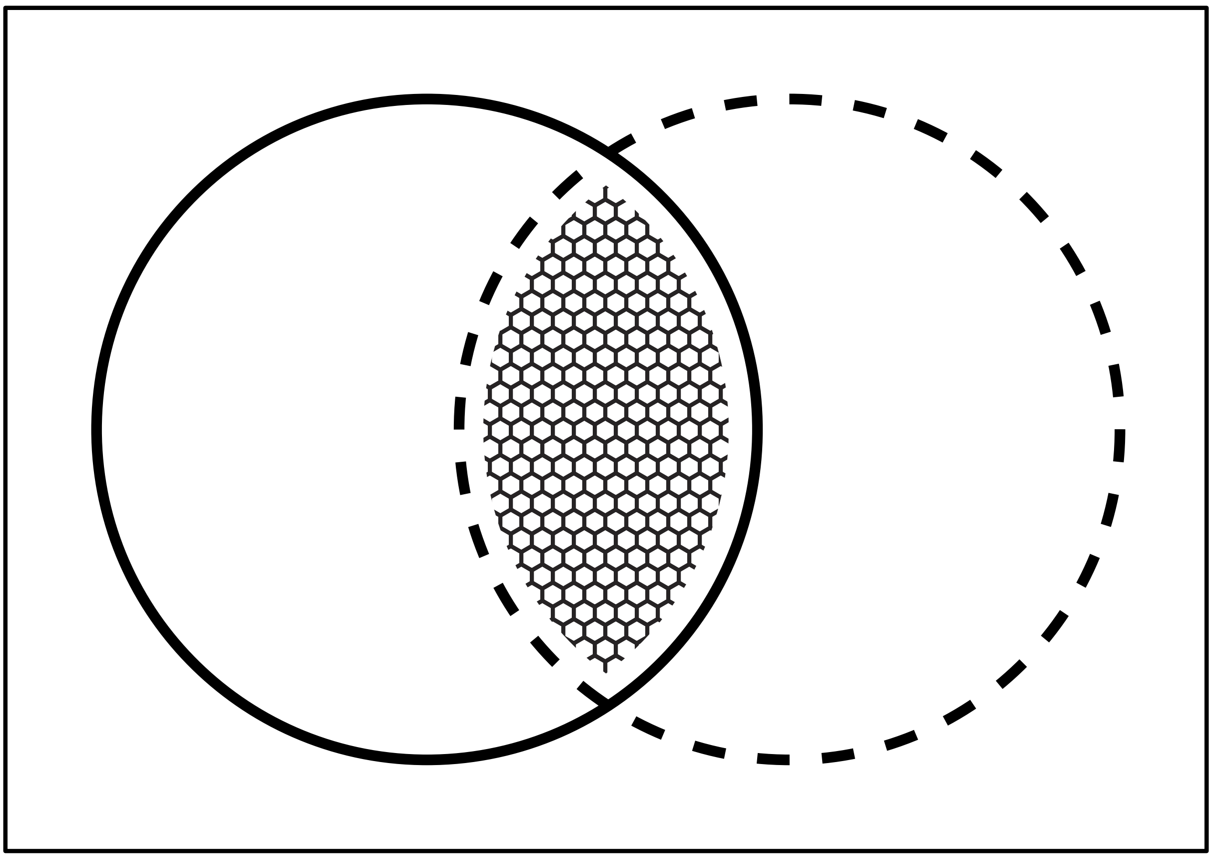
Durchschnittsmenge 'DM

Grundmenge G: Rechteck

A:

B:

A 'DM B:



Zwei Mengen

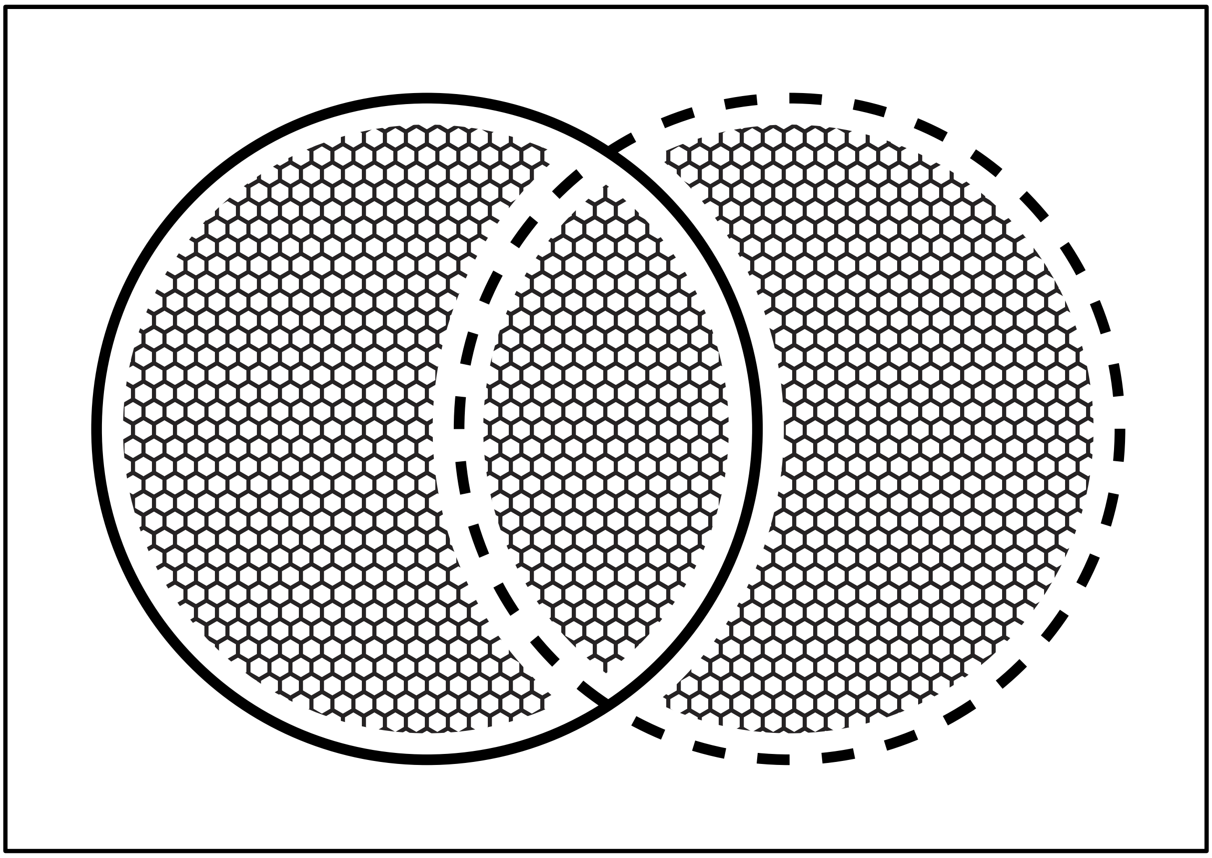
Vereinigungsmenge 'VM

Grundmenge G: Rechteck

A:

B:

A 'VM B:



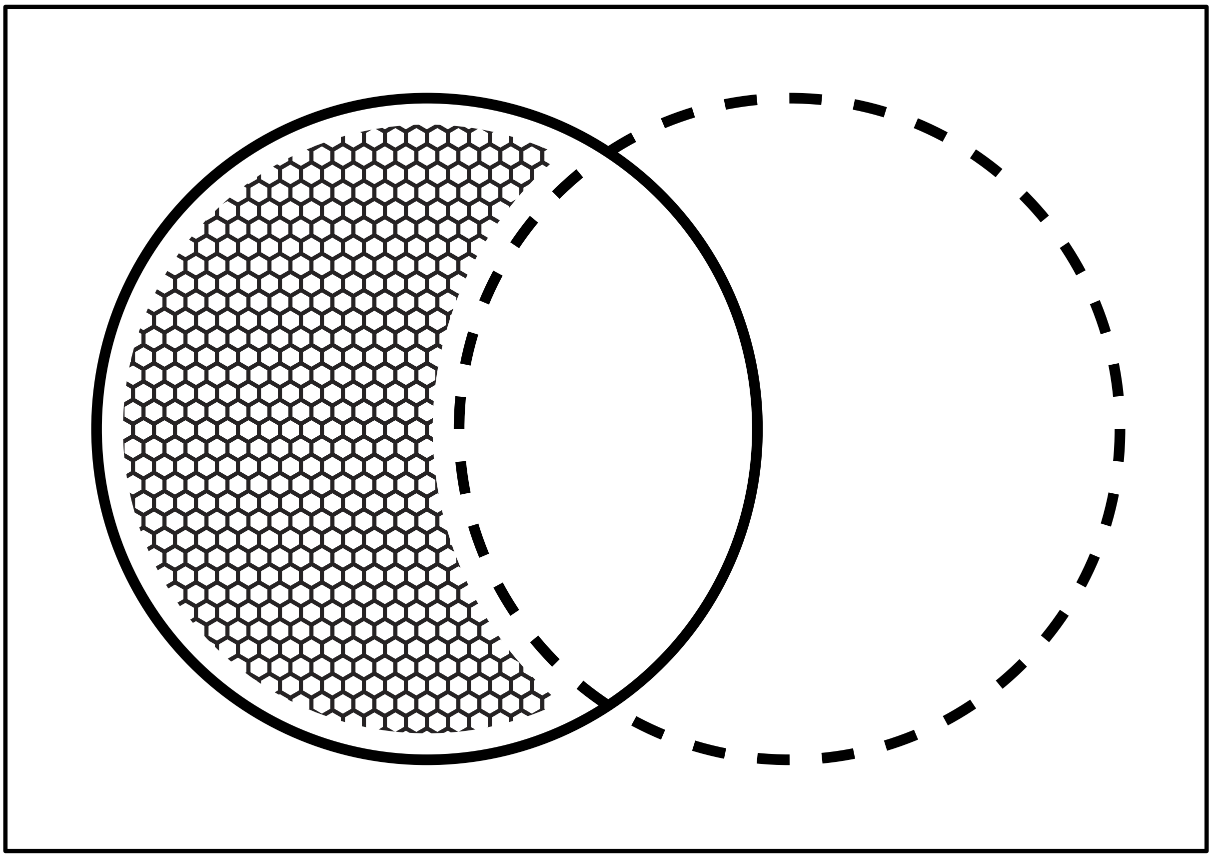
Zwei Mengen

Differenzmenge A \ B

A:

B:

A \ B:



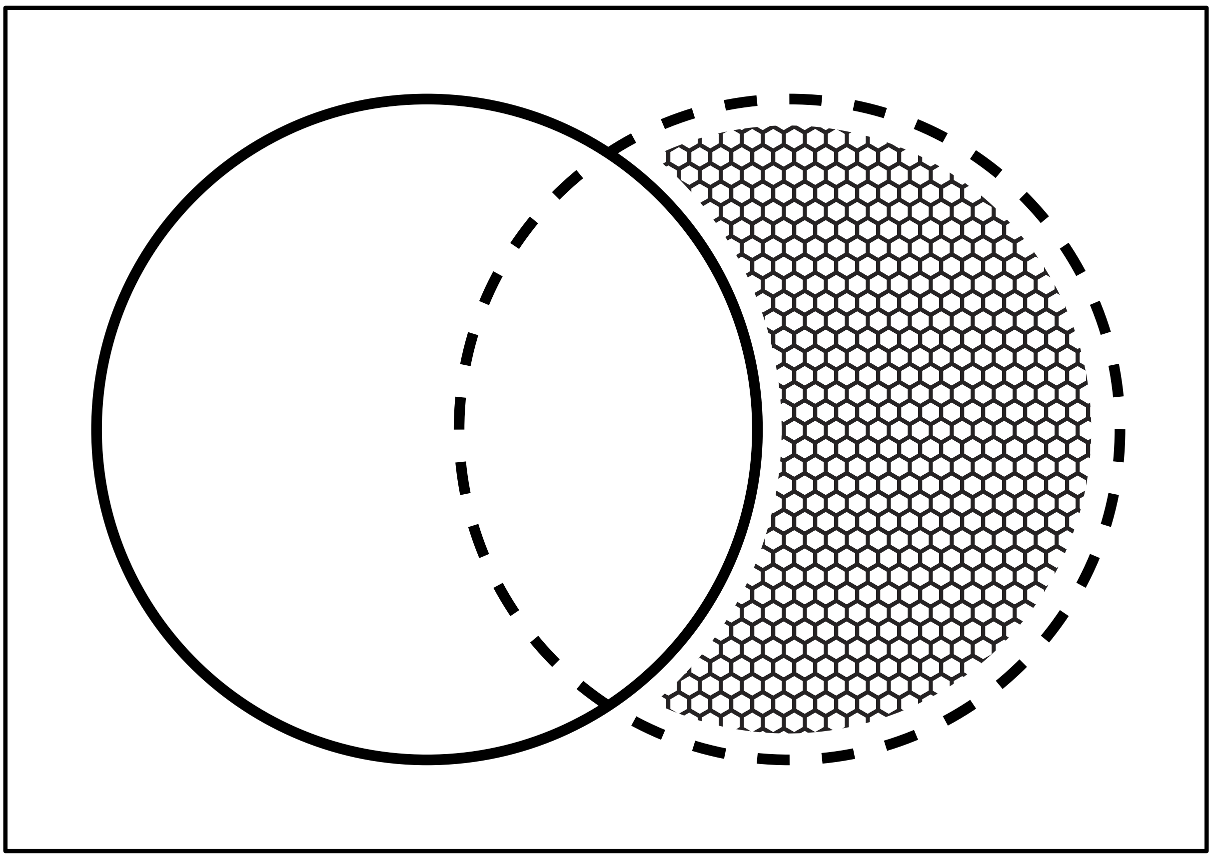
Zwei Mengen

Differenzmenge B \ A

A:

B:

B \ A:



St 09 Mengen, 7/12

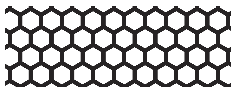
Zwei Mengen

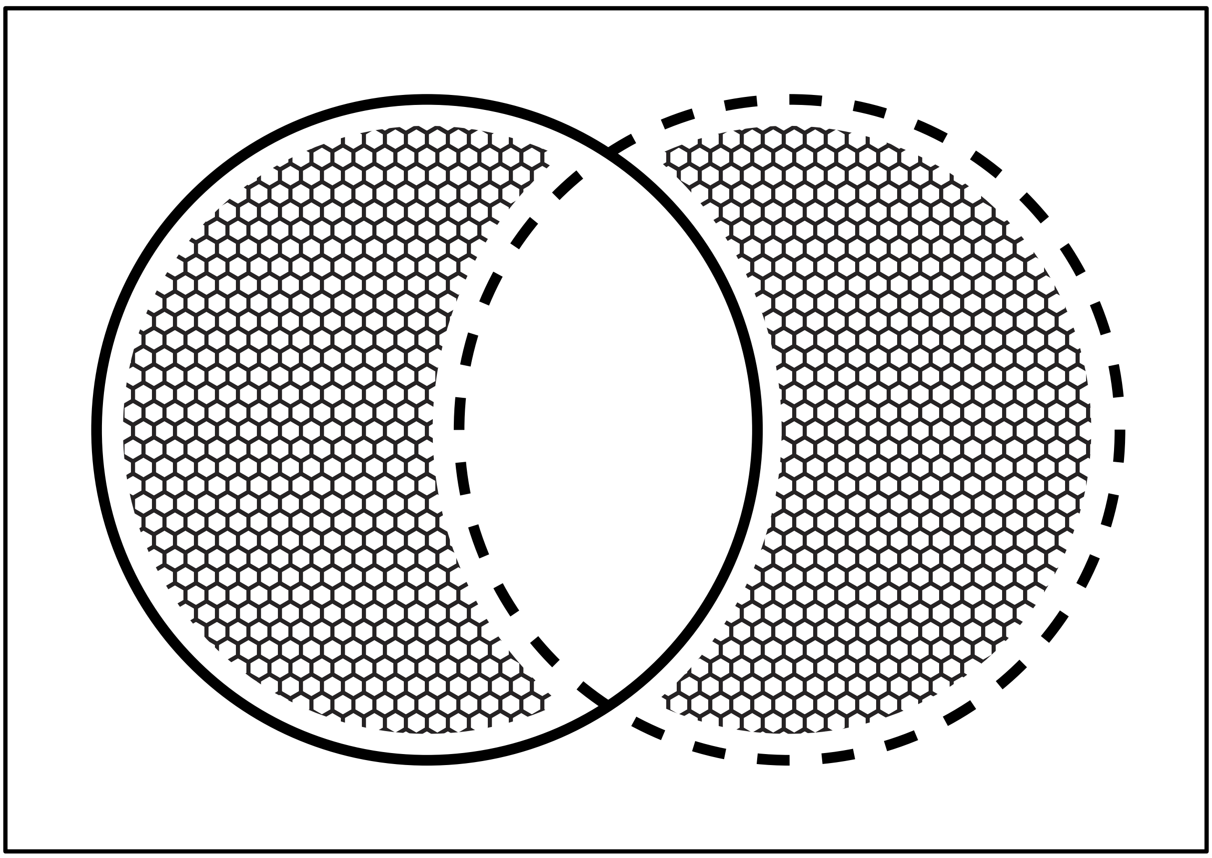
Symmetrische Differenz A 'SD B

A 'SD B =(A \ B) 'VM (B \ A) =(A 'VM B) \ (A 'DM B)

A:

B:

A 'SD B: 



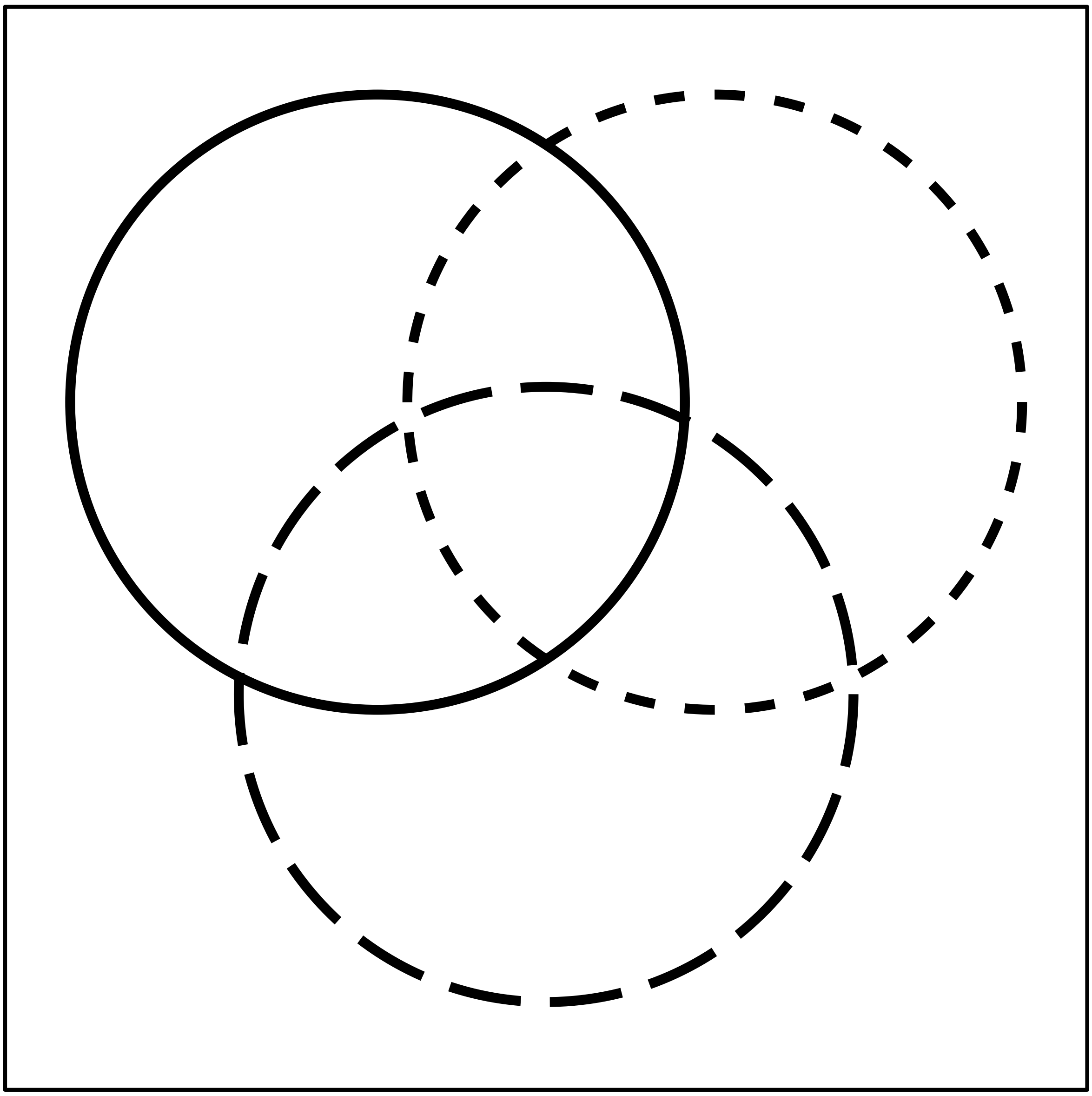
Drei Mengen in einer Grundmenge

Grundmenge G: Rechteck

A:

B:

C:



Drei Mengen

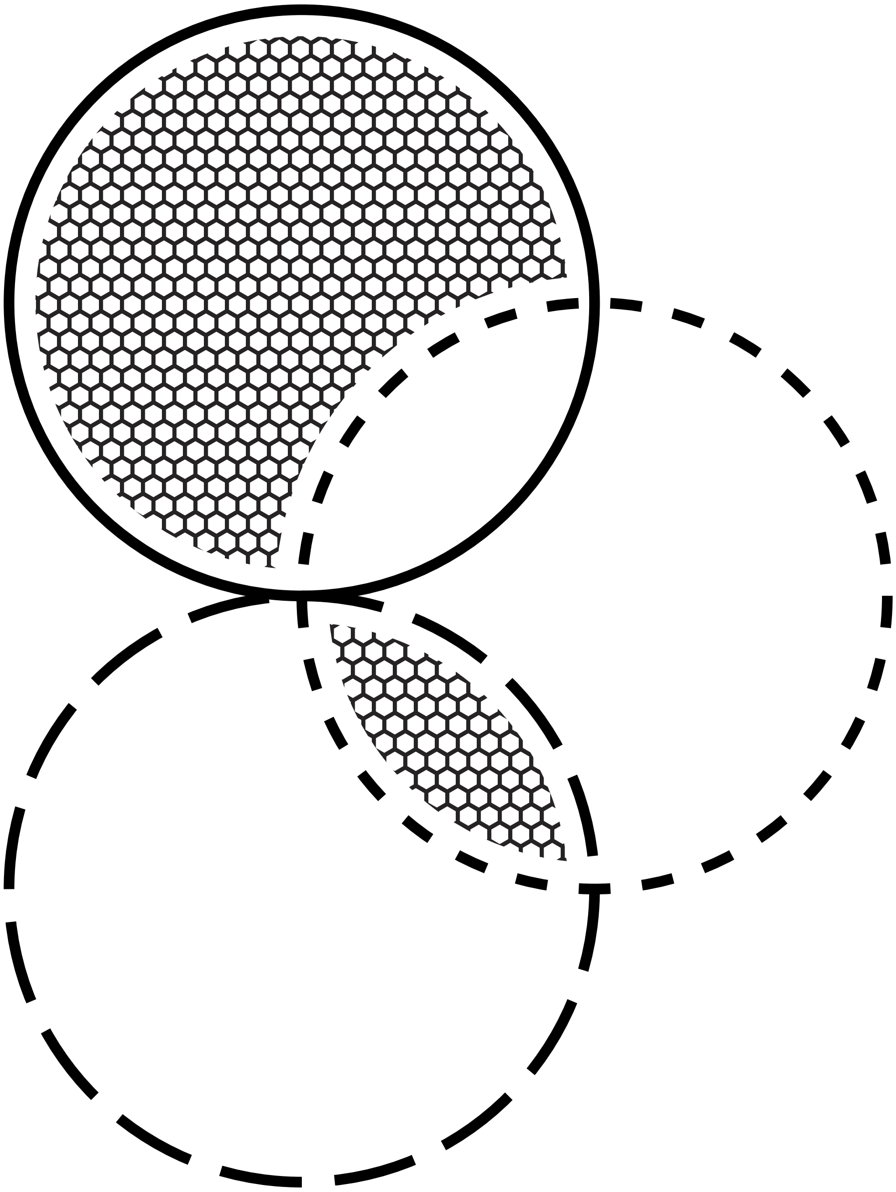
Mengenoperationen_1

A:

B:

C:

(A \ B) 'VM (B 'DM C):



St 09 Mengen, 10/12

Drei Mengen

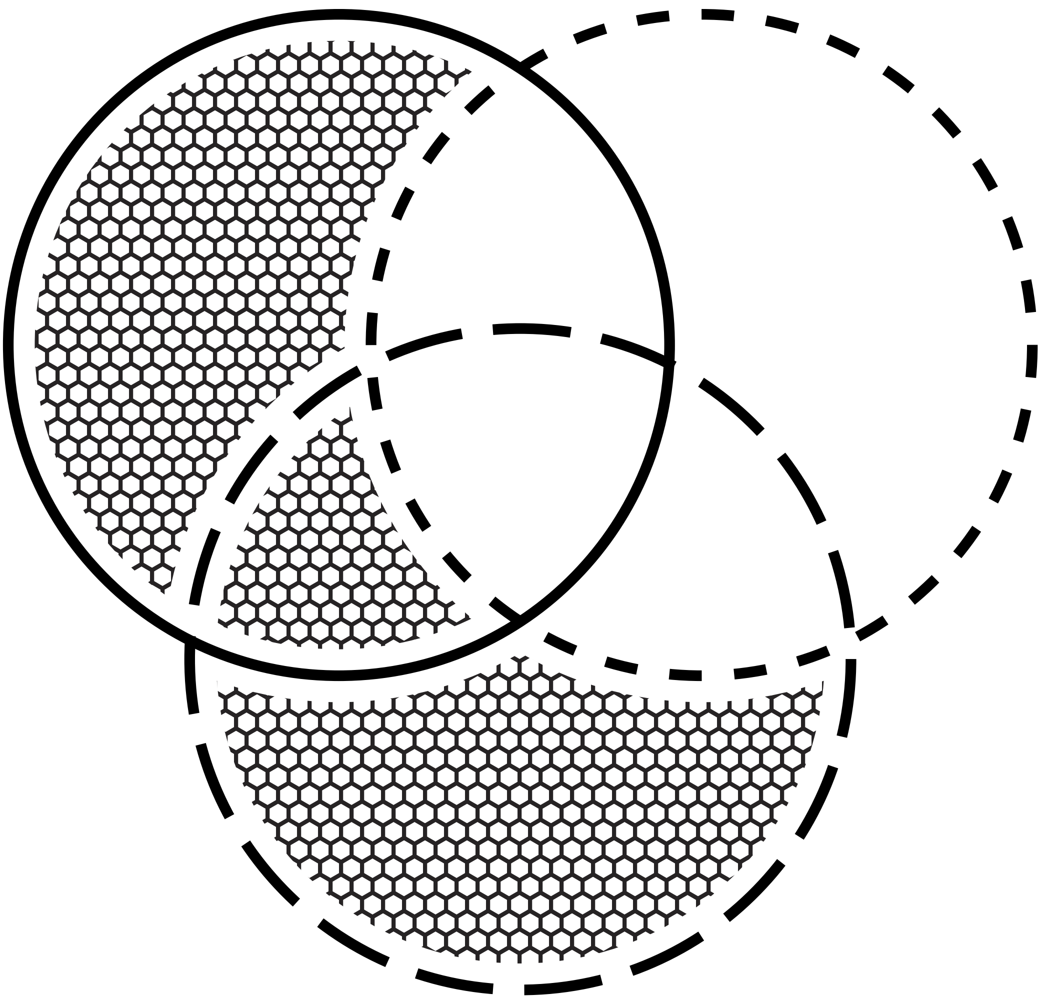
Mengenoperationen_2

A:

B:

C:

(A 'VM C) \ B:



St 09 Mengen, 11/12

Drei Mengen

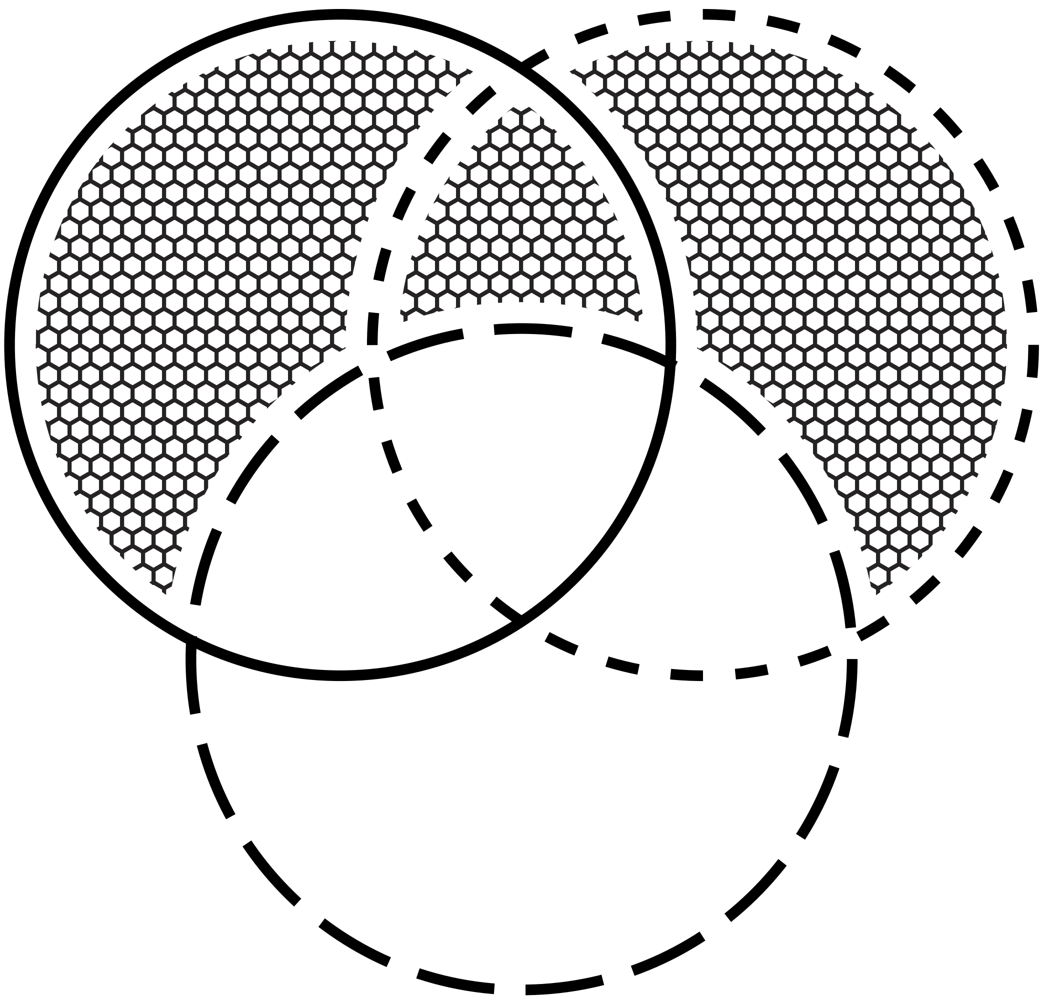
Mengenoperationen_3

A:

B:

C:

(A 'VM B) \ C:



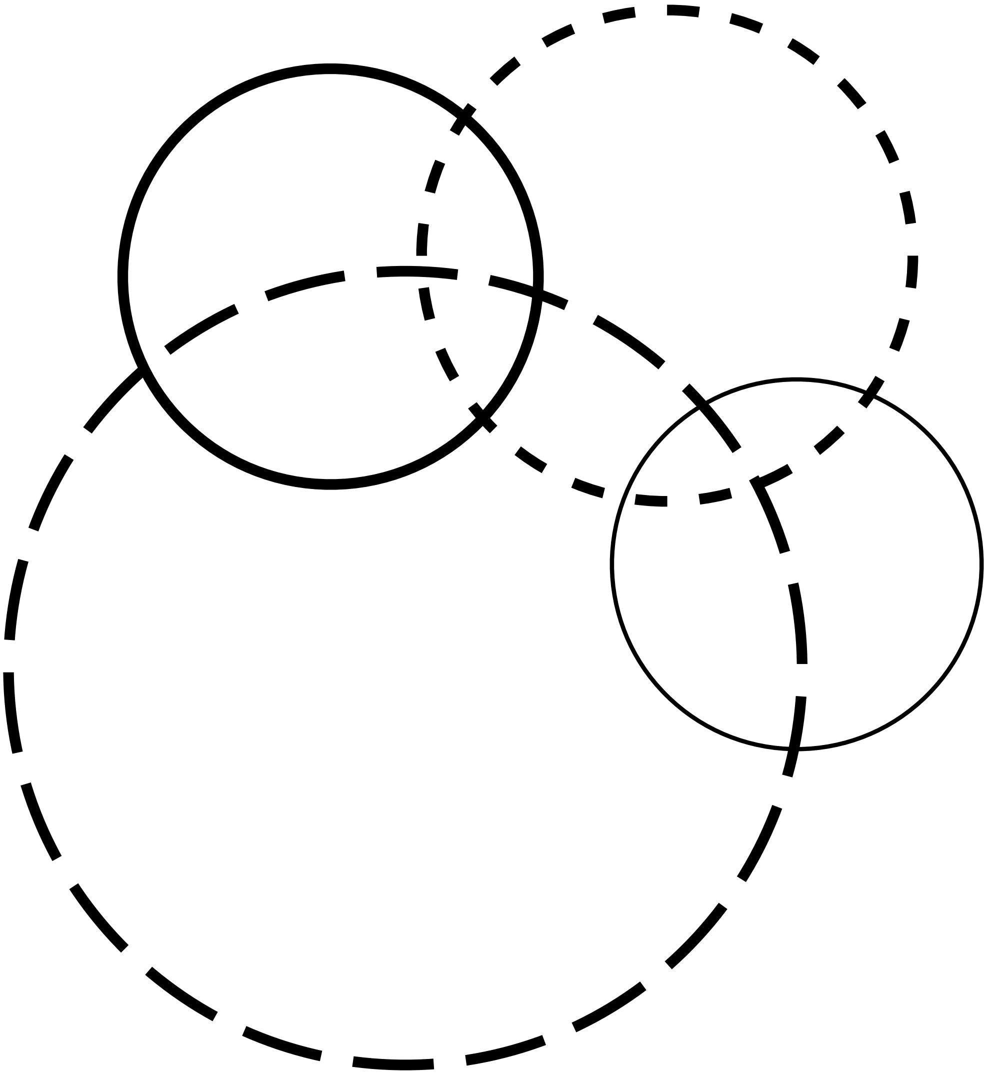
Vier Mengen

A:

B:

C:

D:



Funktionen

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Funktionen

Schulstufe 09

1 keine Funktion

2 f_lin ... lineare Funktion

3 f_q ... quadratische Funktion

12 f_G3 ... Funktion 3. Grades

19 f_G4 ... Funktion 4. Grades

21 f_g ... gerade Funktion

22 f_u ... ungerade Funktion

23 f_gebr1 ... gebrochen rationale Funktion Grad 1

⠣⠱ ⠋⡸⠛⠑⠃⠗⠣ ⠄⠄⠄ ⠛⠑⠃⠗⠕⠉⠓⠑⠝

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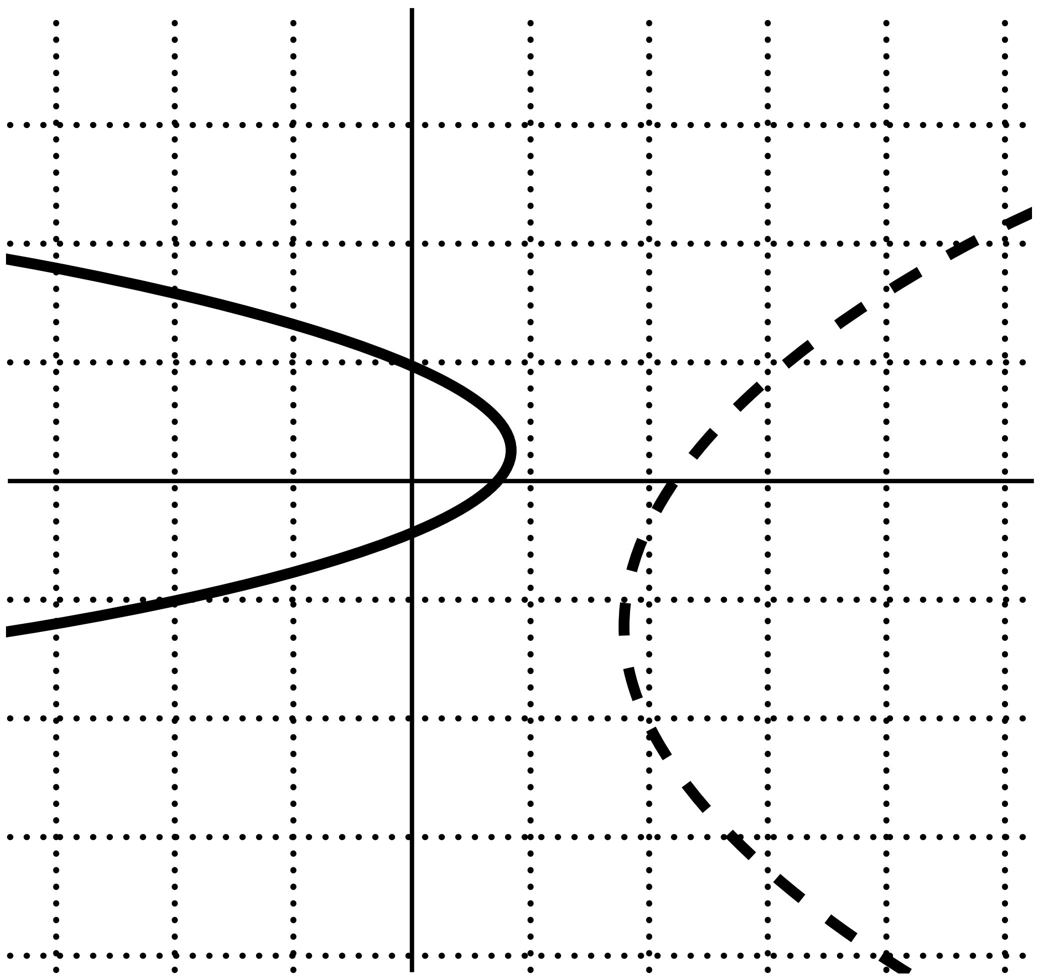
⠣⠳ ⡑⡅ ⠄⠄⠄ ⡑⠊⠝⠓⠑⠊⠞⠎⠅⠗⠑⠊⠎

keine Funktionen

mehr y-Werte zu einem x



f_lin: f(x) =k *x +d

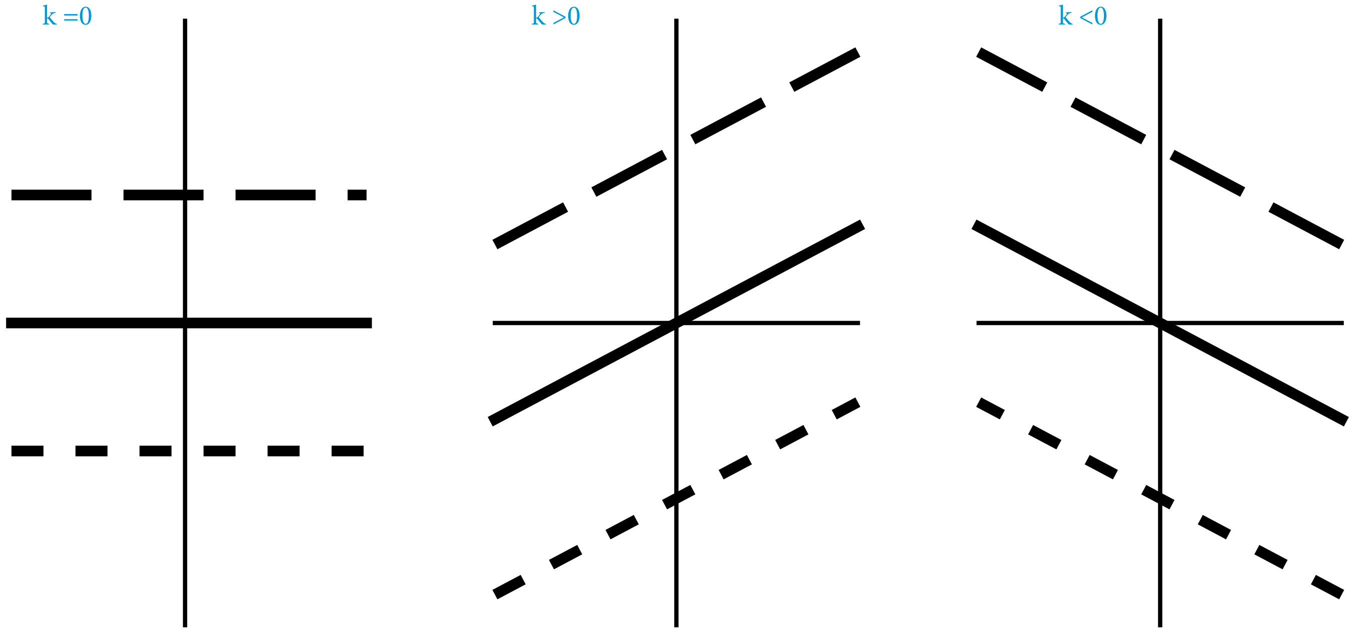
f(x) =k *x +d

d =0:

d >0:

d <0:

k =0 k >0 k <0



f_q.1: f(x) =a *x^2

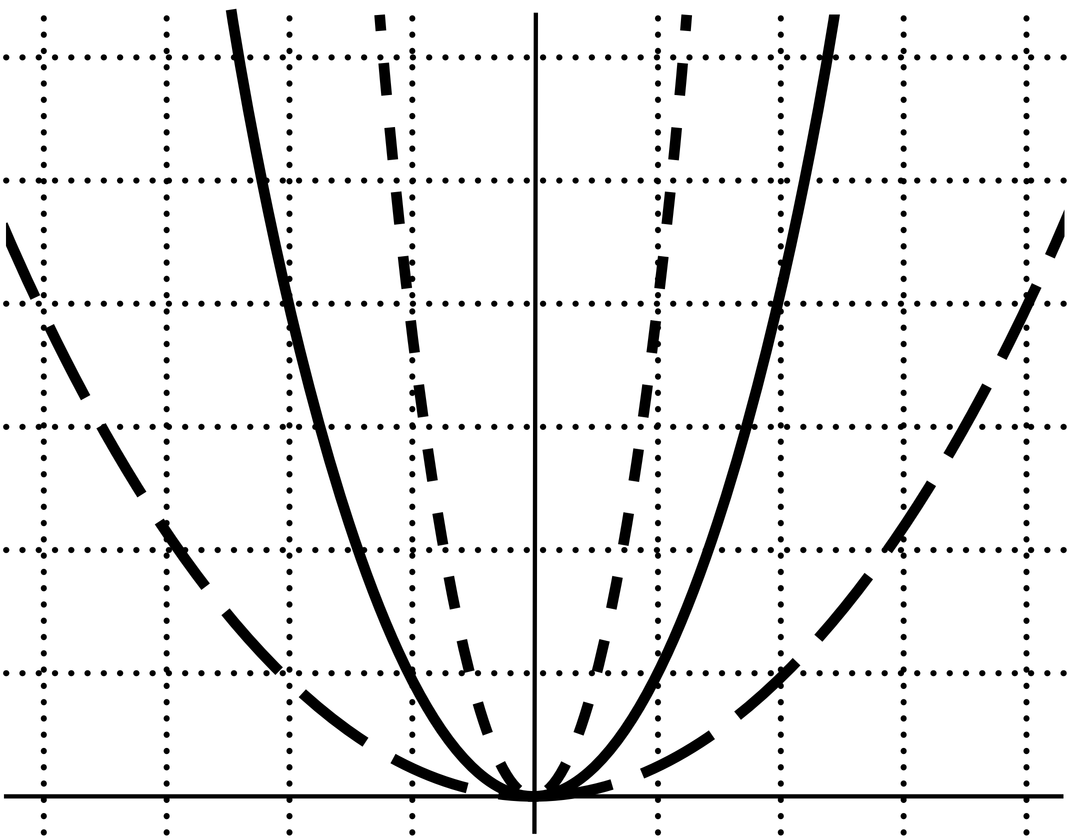
Parabel nach oben offen:

a >0:

f(x) =x^2; a =+1:

f(x) =1/4 *x^2; a =1/4:

f(x) =4 *x^2; a =4:



f_q.2: f(x) =a *x^2

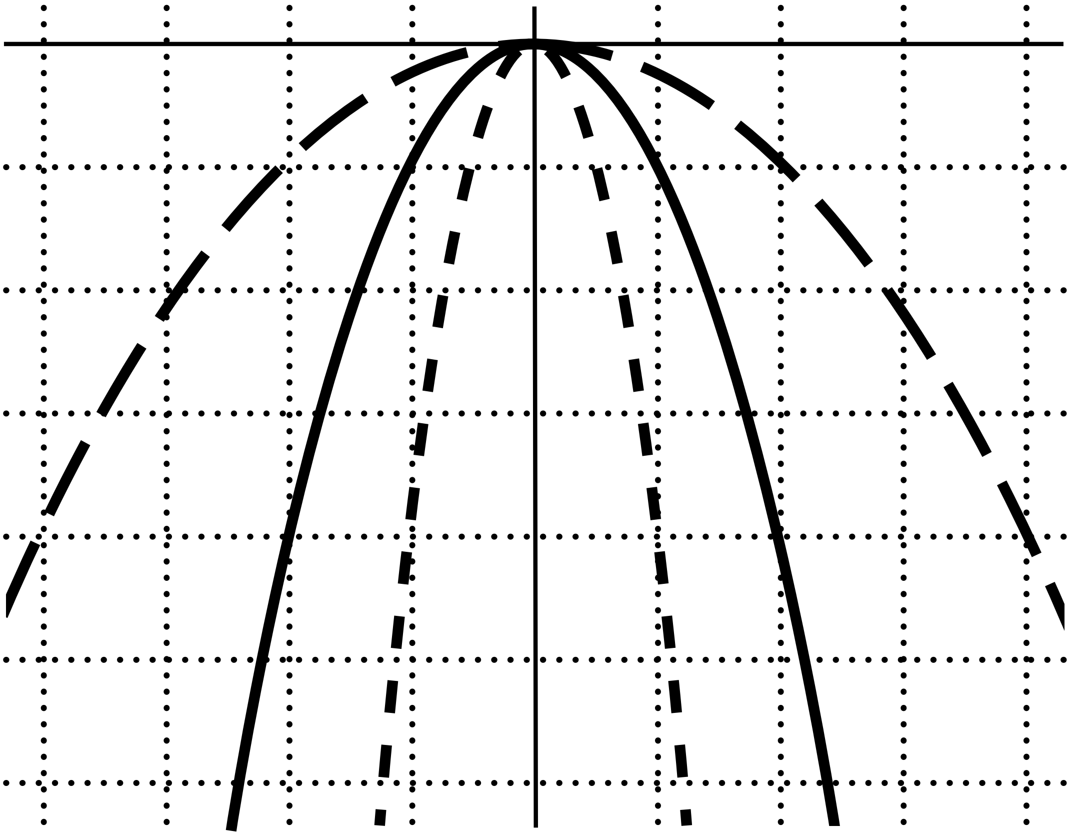
Parabel nach unten offen:

a <0:

f(x) =-x^2; a =-1:

f(x) =-1/4 *x^2; a =-1/4:

f(x) =-4 *x^2; a =-4:

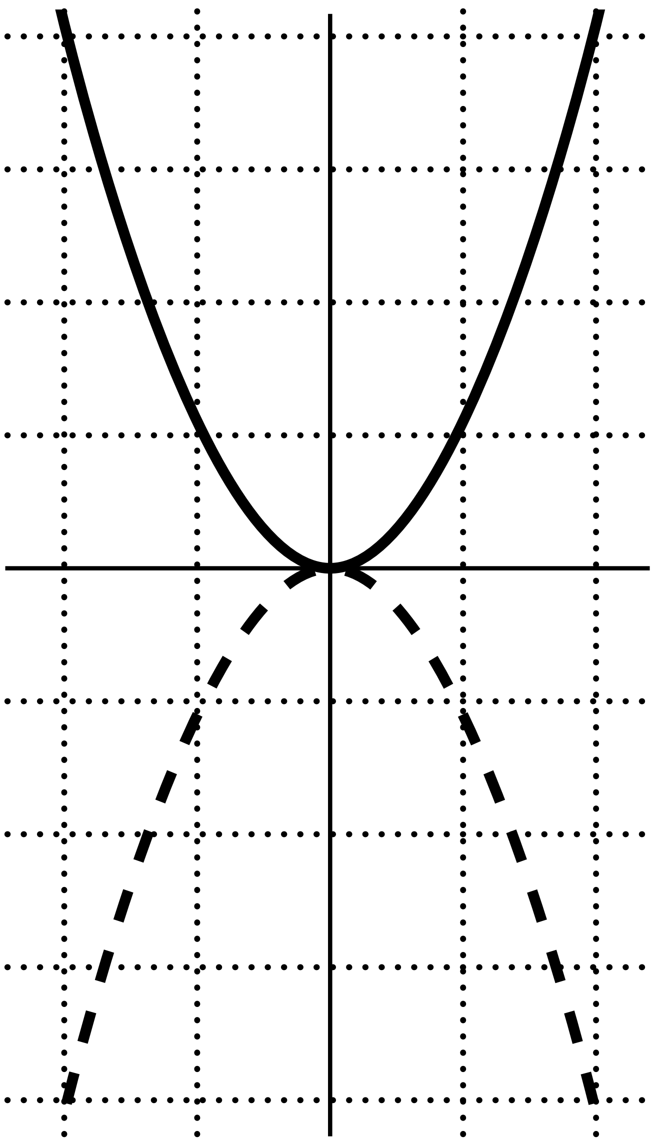


f_q.3: f(x) =a *x^2

Parabel spiegeln

a =1:

a =-1:



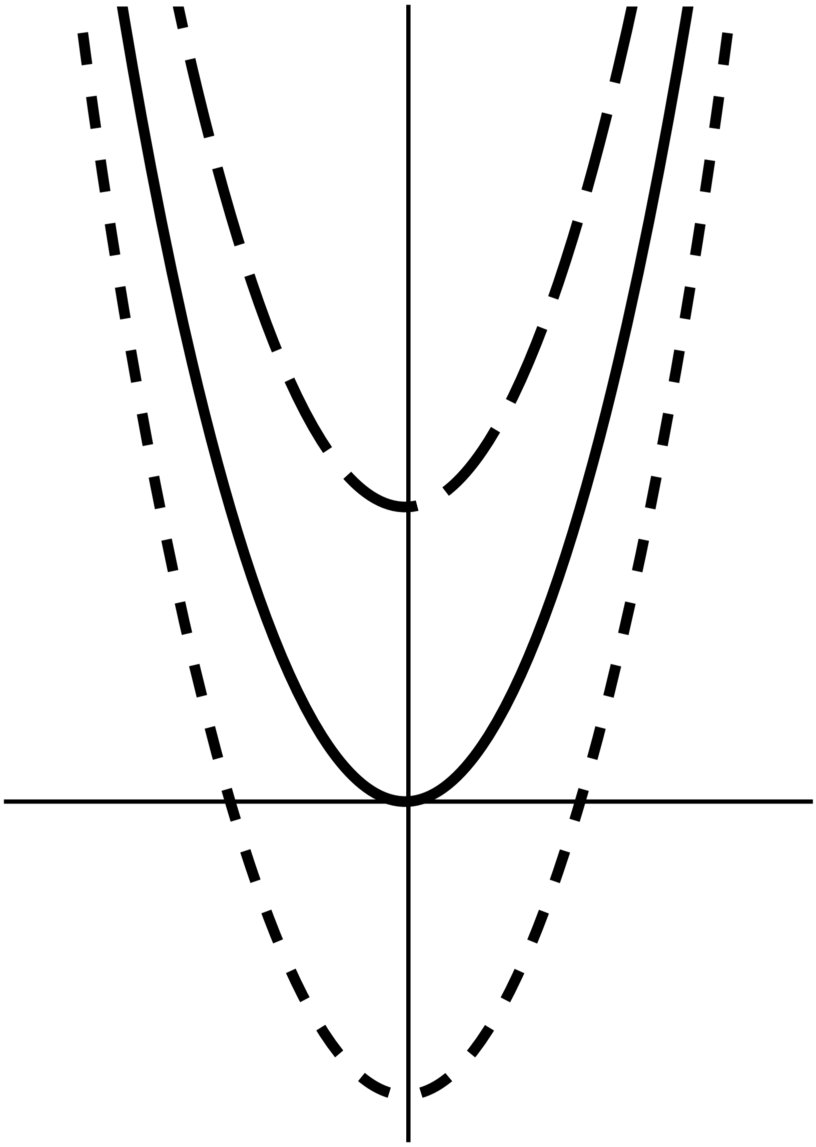
f_q.4: f(x) =x^2 +c

senkrecht verschieben

c =0 (f(x) =x^2):

c >0 (hinauf):

c <0 (hinunter):

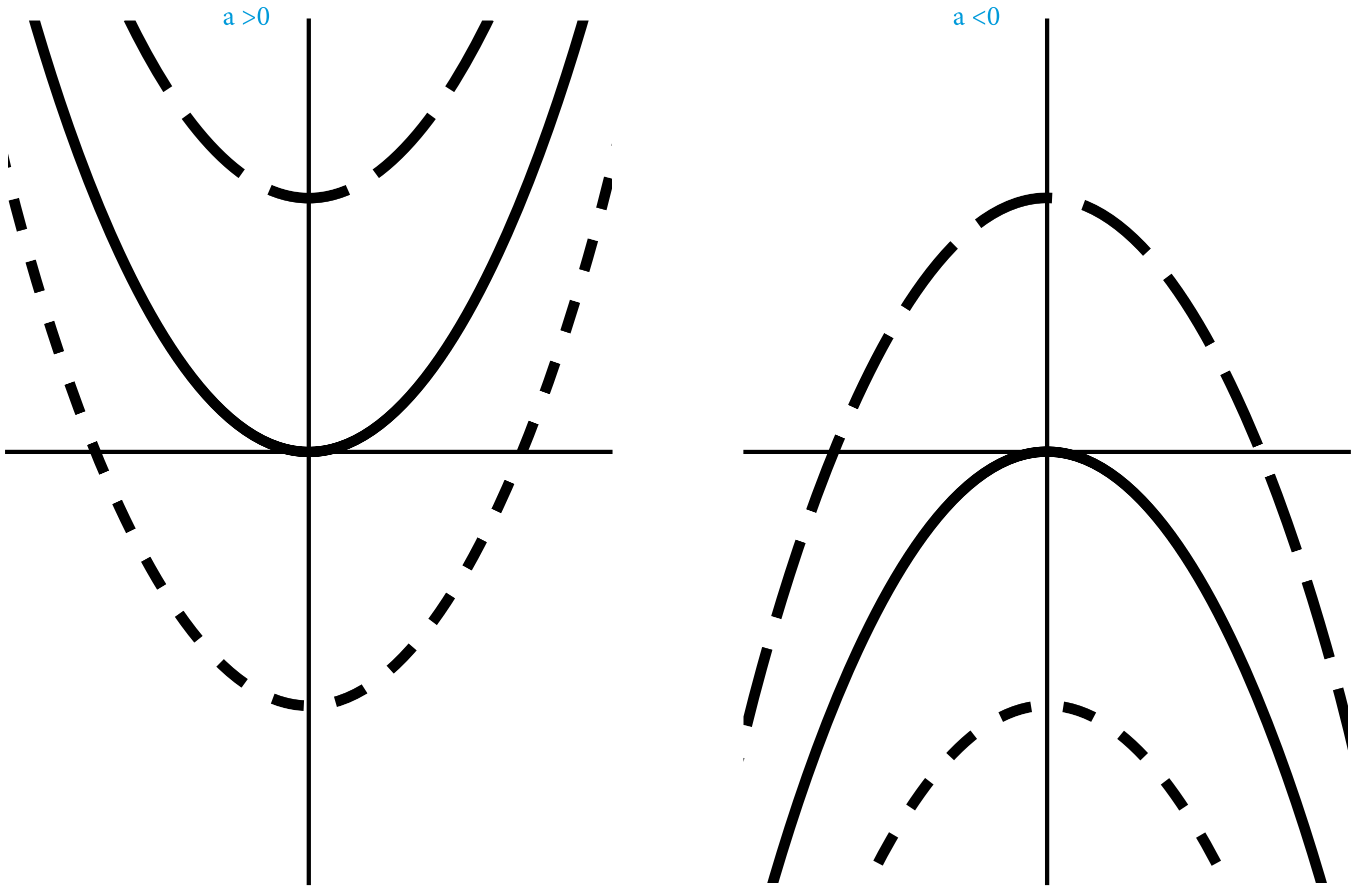


f_q.5: f(x) =a *x^2 +c

c =0:

c>0:

c <0:



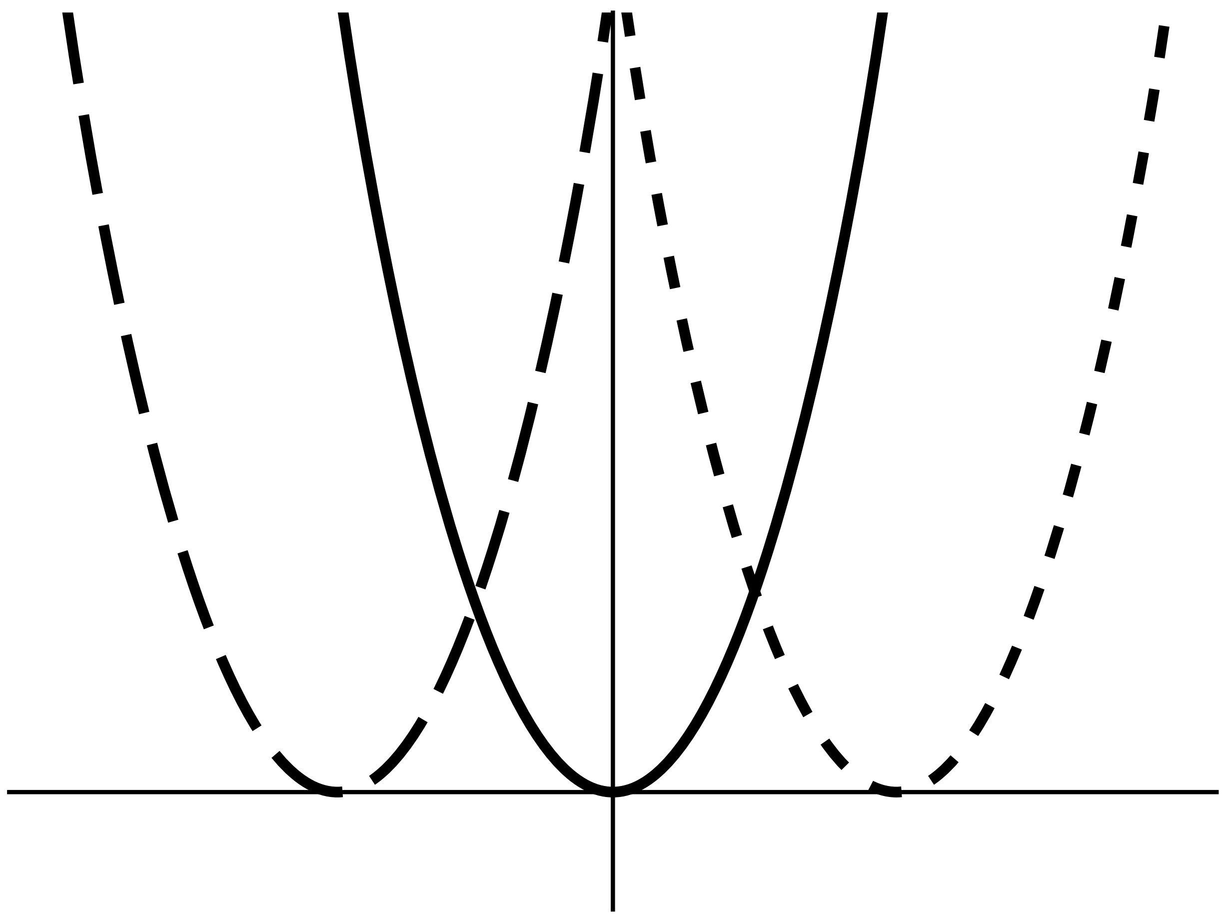
f_q.6: f(x) =(x +b)^2

waagrecht verschieben

b =0 (f(x) =x^2):

b>0 (nach links):

b <0 (nach rechts):

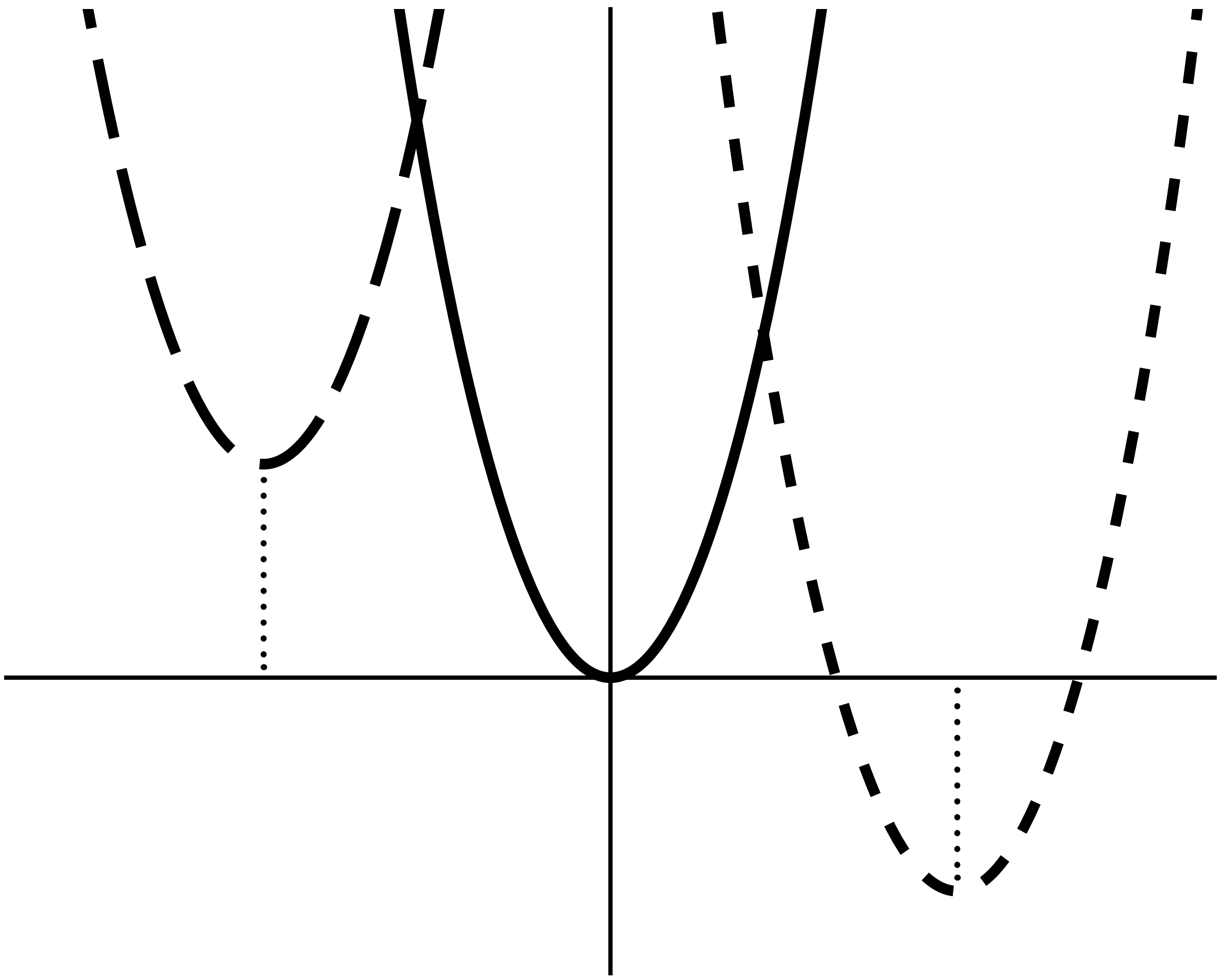


f_q.7: f(x) =(x +b)^2 +c

b =0, c =0 (f(x) =x^2):

b >0, c >0 (li, hinauf):

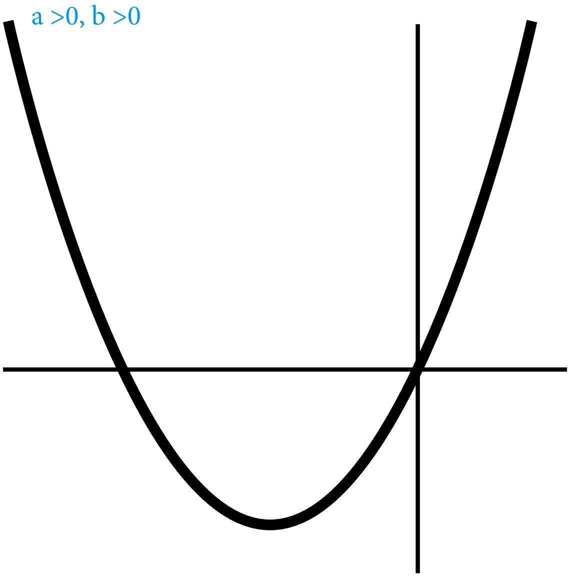
b <0, c <0 (re, hinunter):



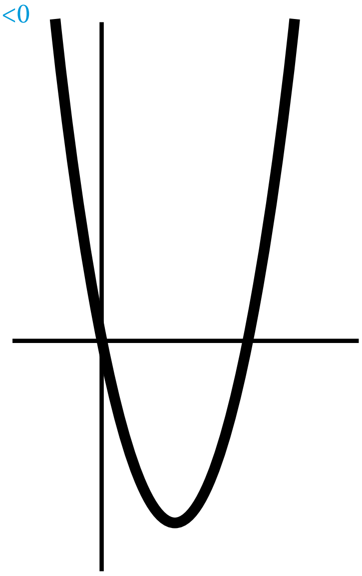
f_q.8: f(x) =a *x^2 +b *x

enthält Ursprung (0|0)

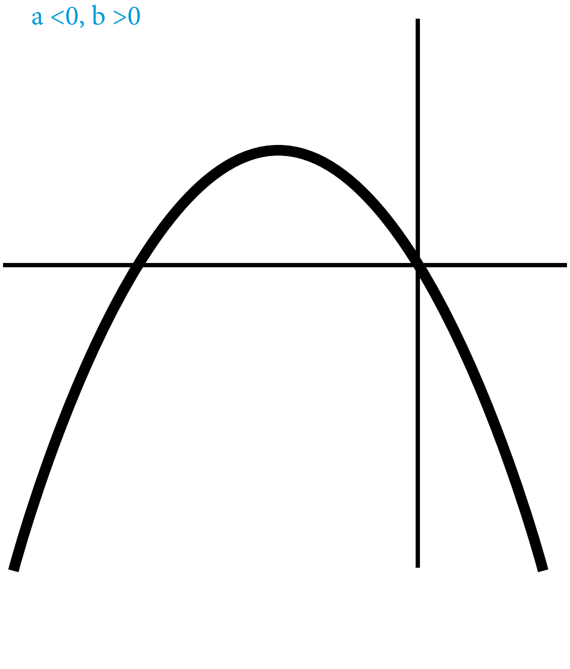
a >0, b >0



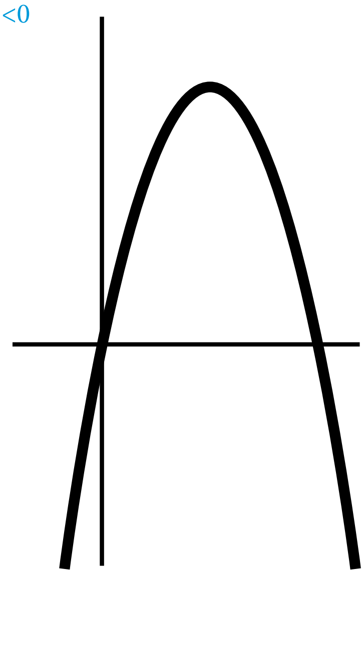
a >0, b <0



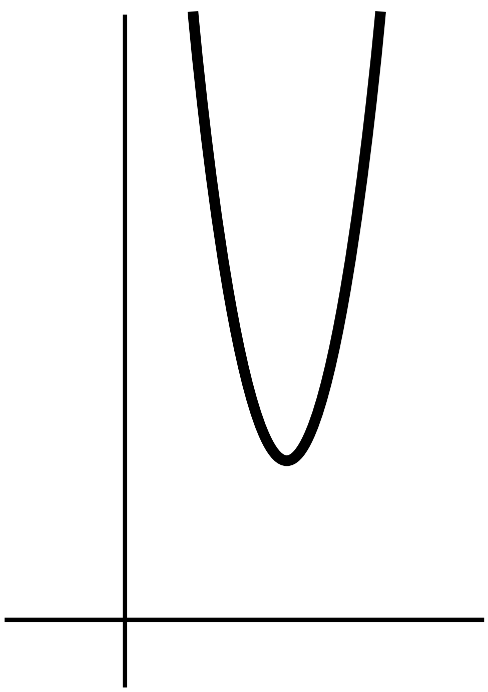
a <0, b >0

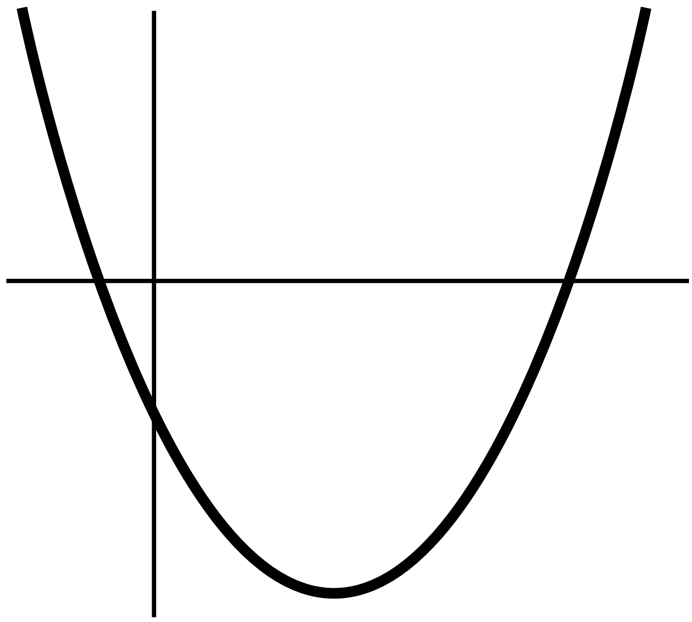


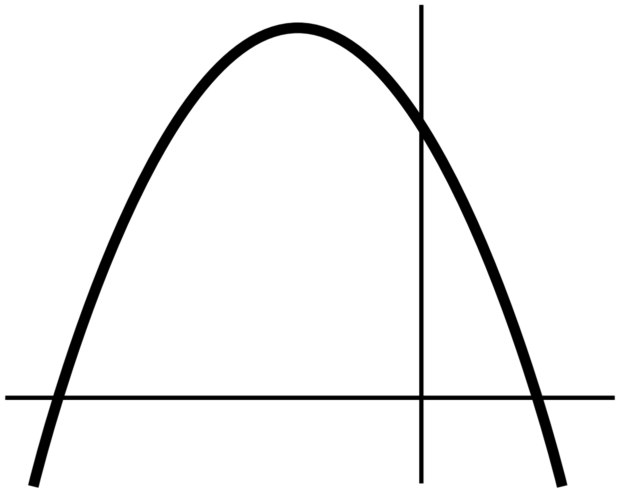
a <0, b <0

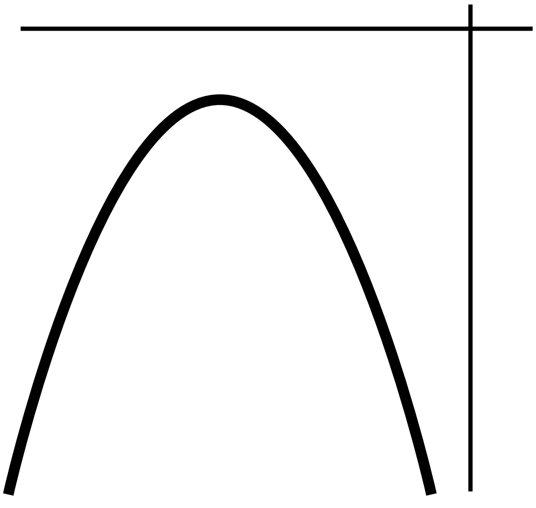


f_q.9: f(x) =a *x^2 +b *x +c





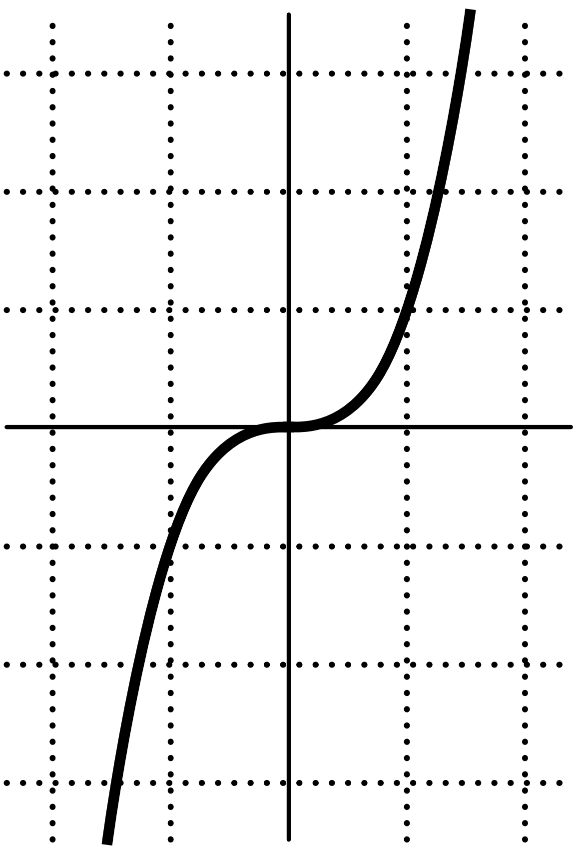


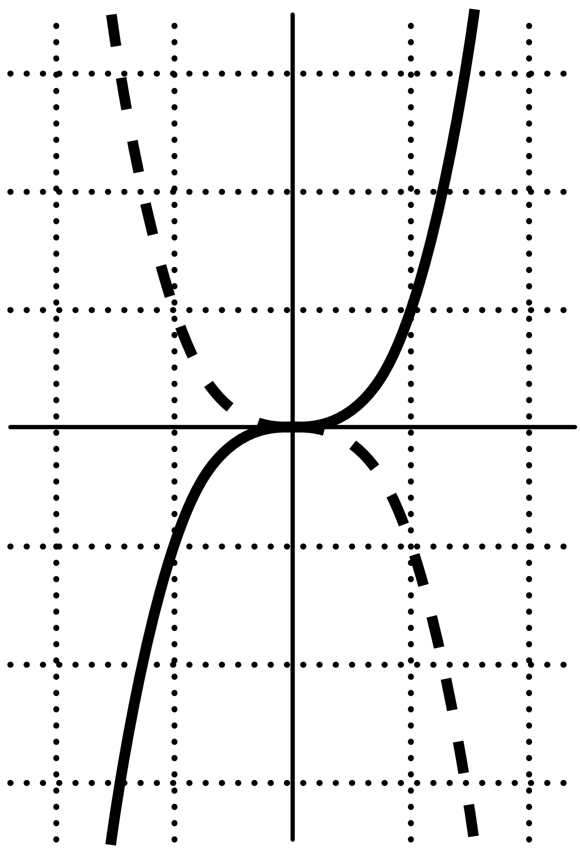


f_G3.1: f(x) =a *x^3

a =1 (f(x) =x^3):

a =-1 (f(x) =-x^3):





f_G3.2: f(x) =a *x^3 +c

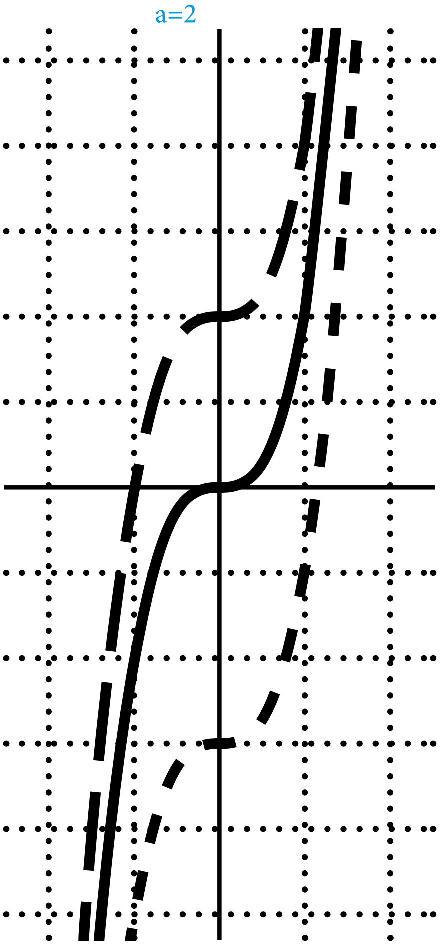
senkrecht verschieben

a >0, c =0:

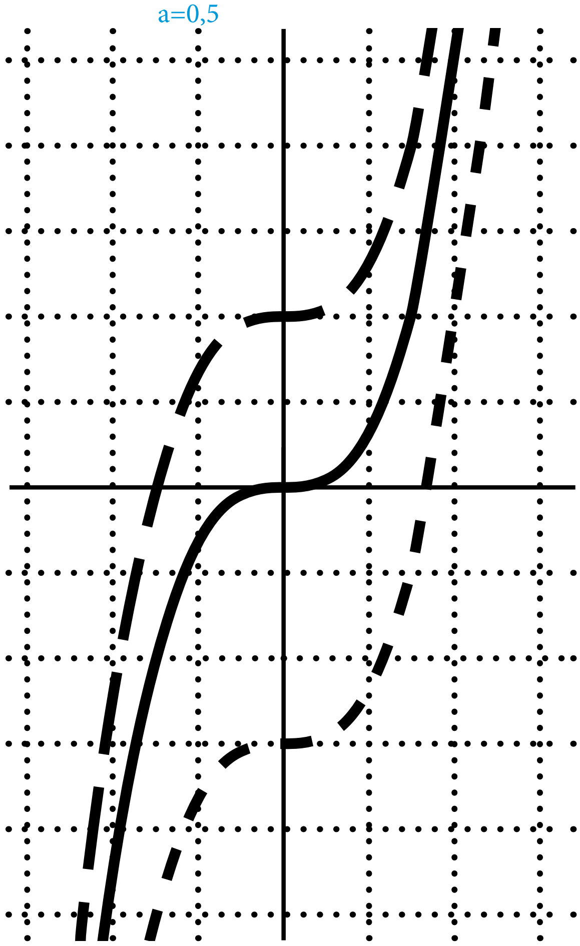
a >0, c >0 (hinauf):

a >0, c <0 (hinunter):

a=2



a=0,5



f_G3.3: f(x) =a *x^3 +c

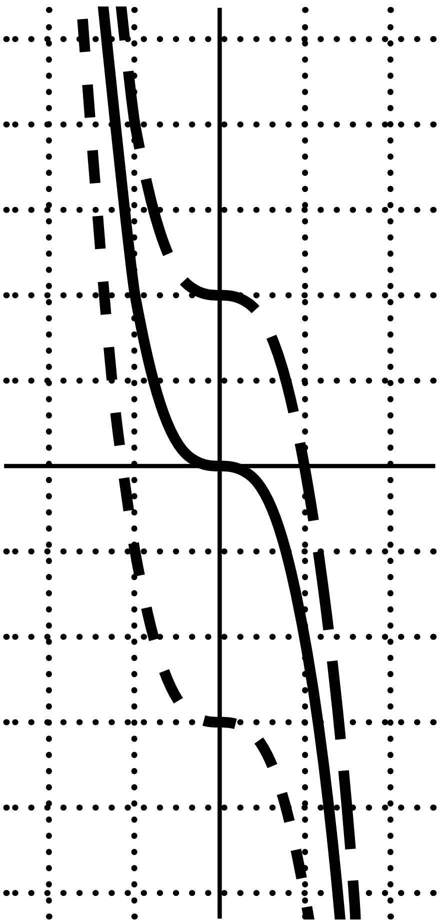
senkrecht verschieben

a <0, c =0:

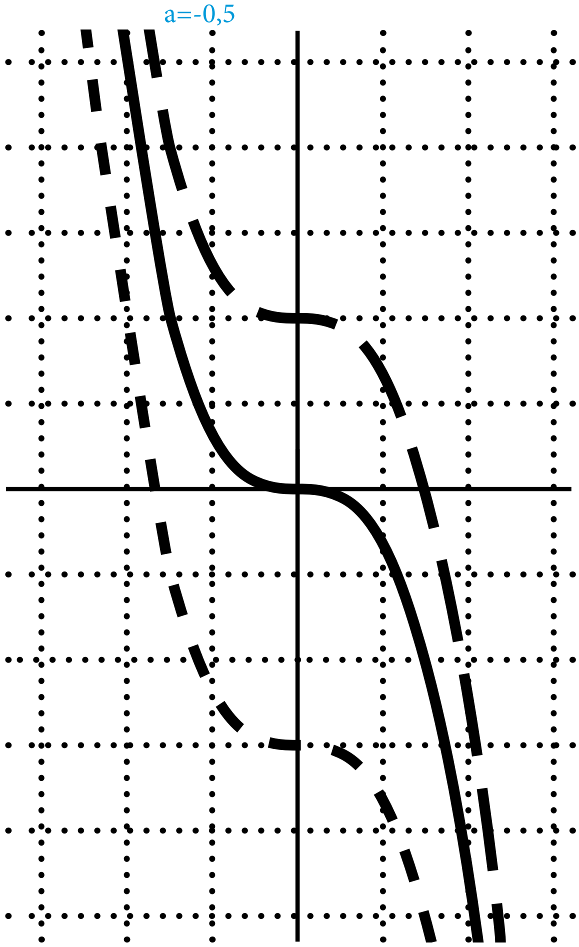
a <0, c >0 (hinauf):

a <0, c <0 (hinunter):

a=-2



a=-0,5



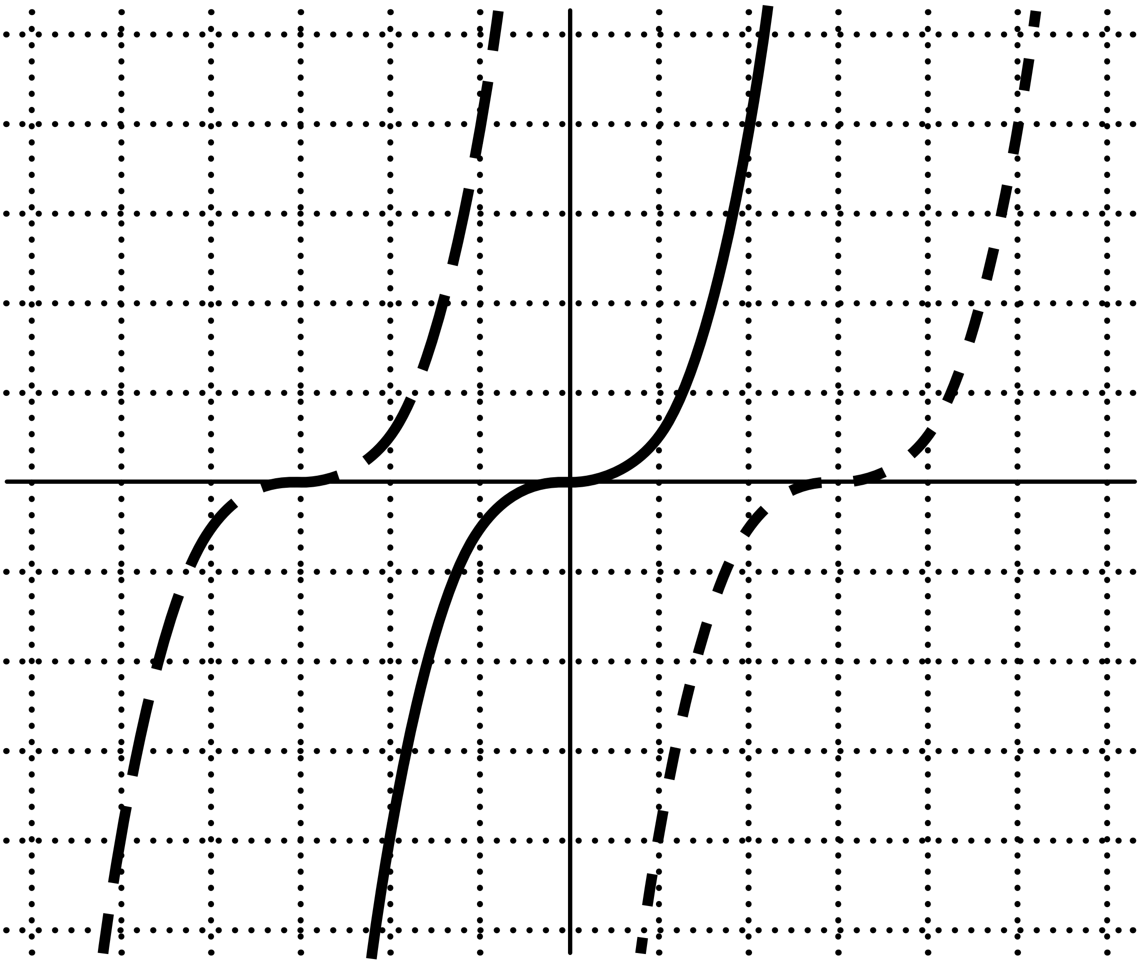
f_G3.4: f(x) =a *(x +b)^3

waagrecht verschieben

a >0, b =0:

a >0, b >0 (nach links):

a >0, b <0 (n. rechts):



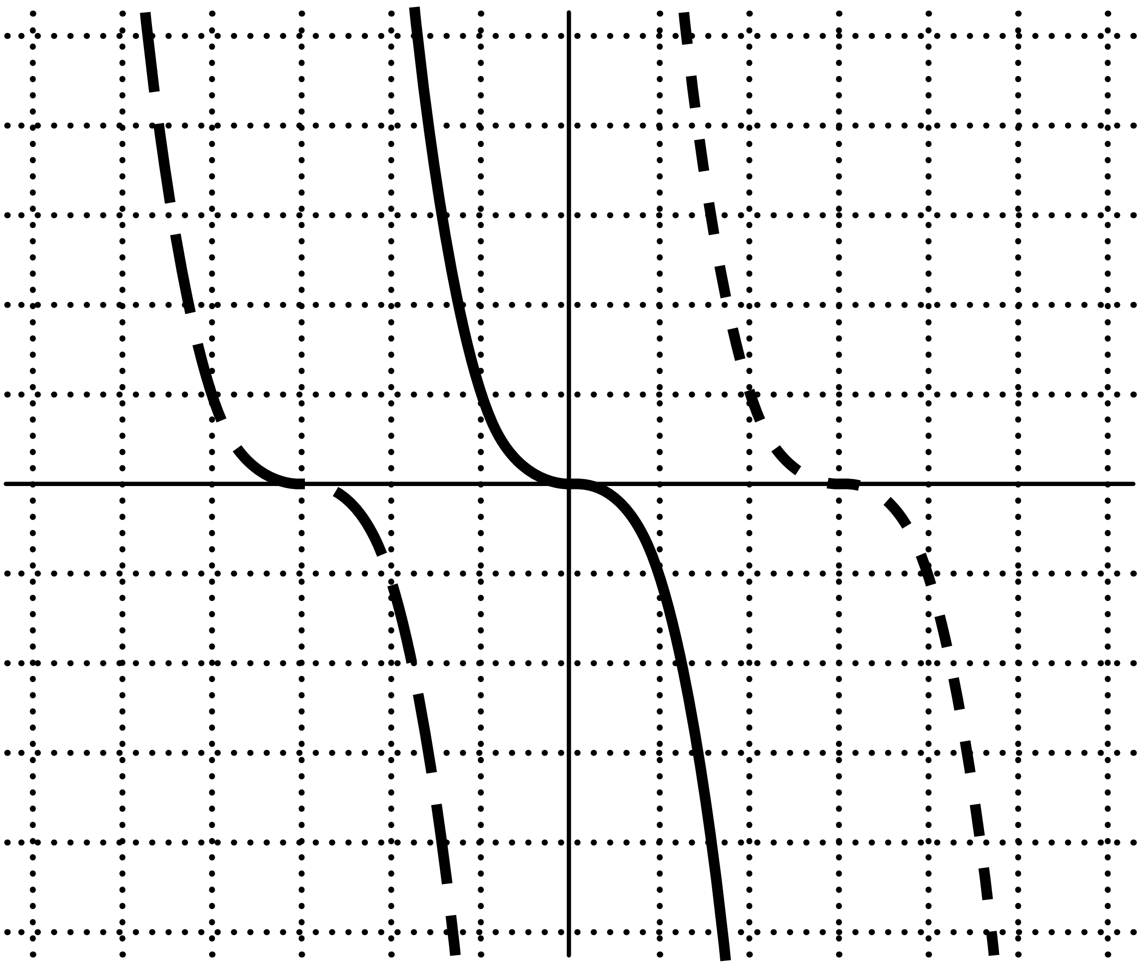
f_G3.5: f(x) =a *(x +b)^3

waagrecht verschieben

a <0, b =0:

a <0, b >0 (nach links):

a <0, b <0 (n. rechts):

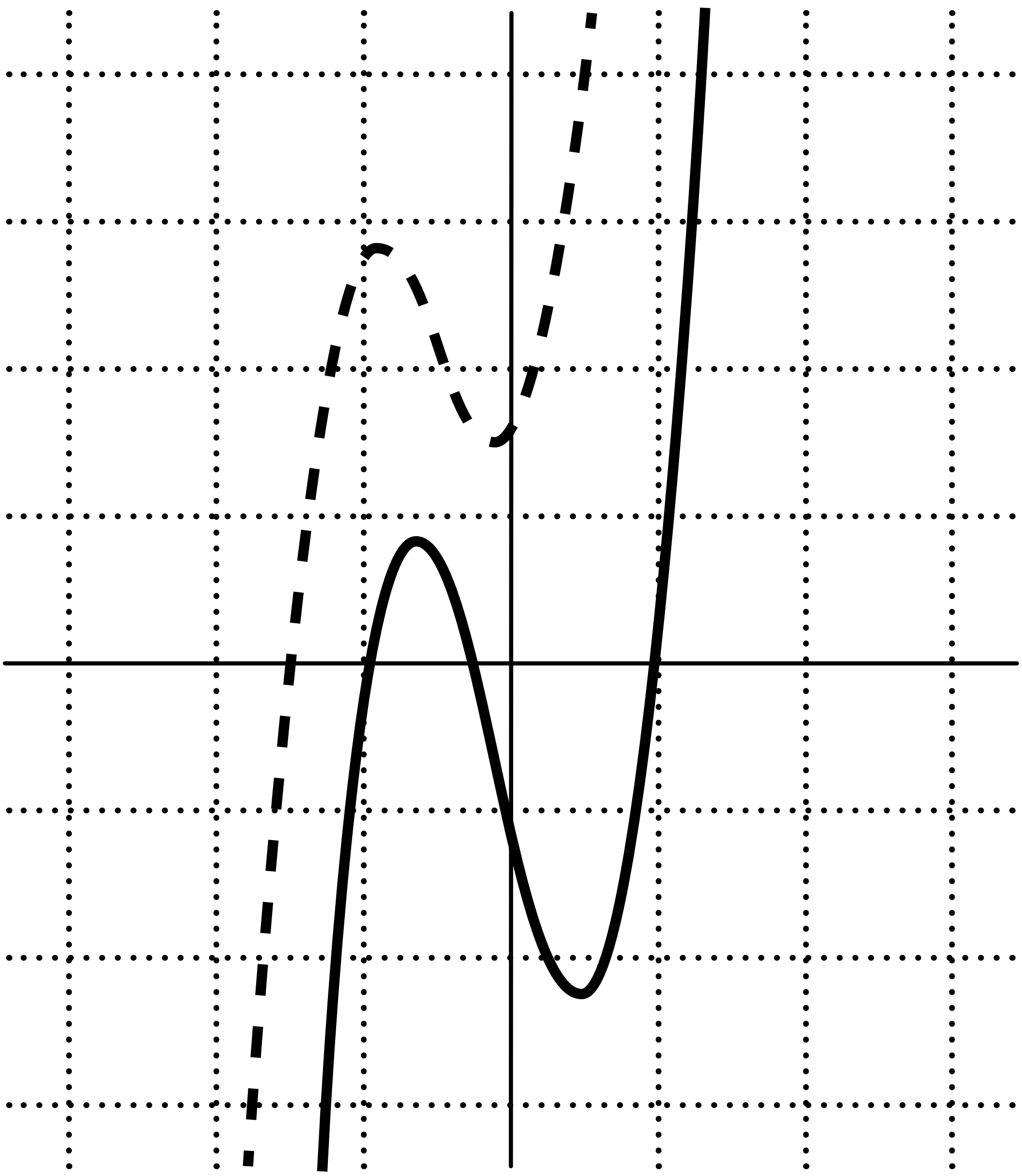


f_G3.6: a *x^3 +b *x^2 +c *x +d

enthält Punkt (0|d)

1 bis 3 Nullstellen

a >0: beginnt steigend

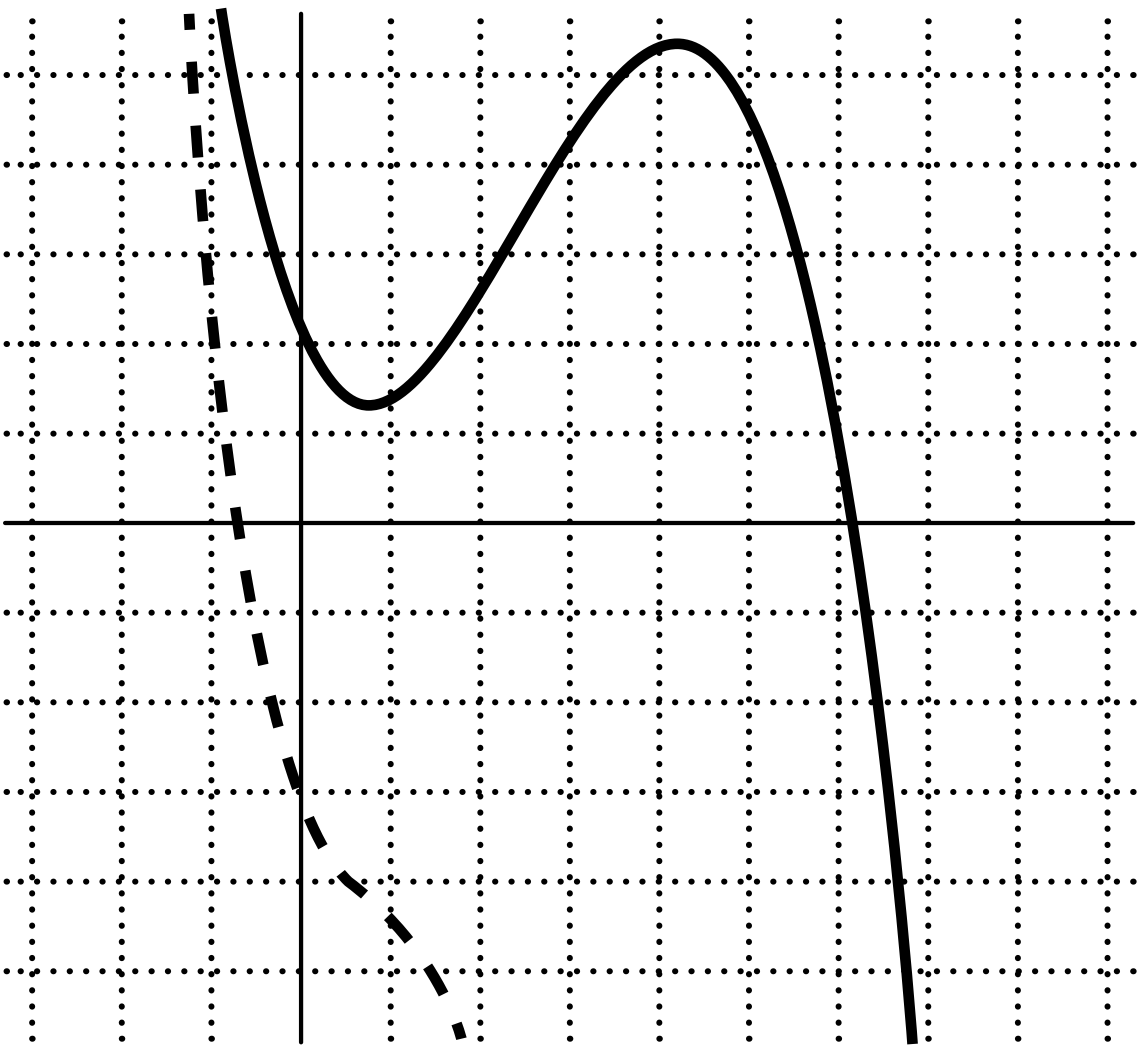


f_G3.7: f(x) =a *x^3 +b *x^2 +c *x +d

enthält Punkt (0|d)

1 bis 3 Nullstellen

a <0: beginnt fallend



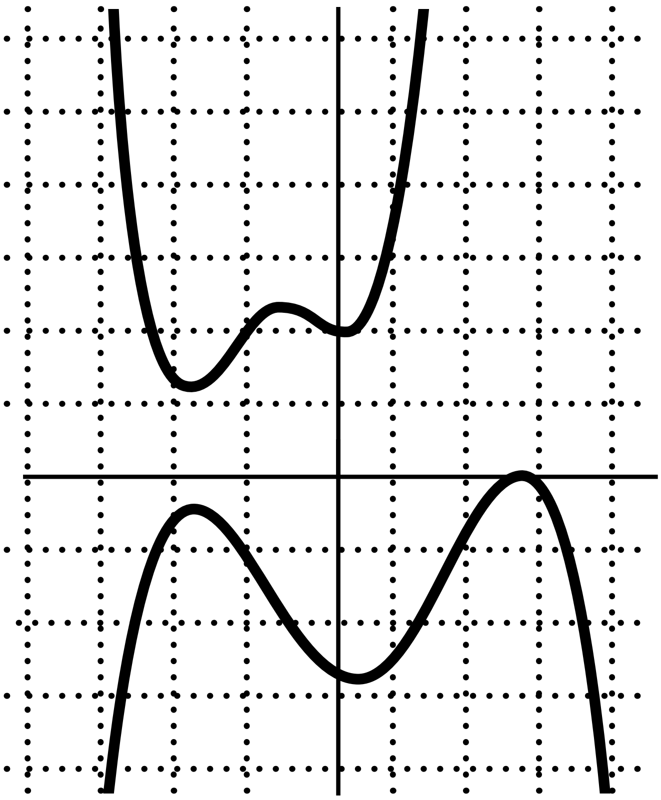
f_G4.1: f(x) =a *x^4 +b *x^3 +c *x^2 +d *x +e

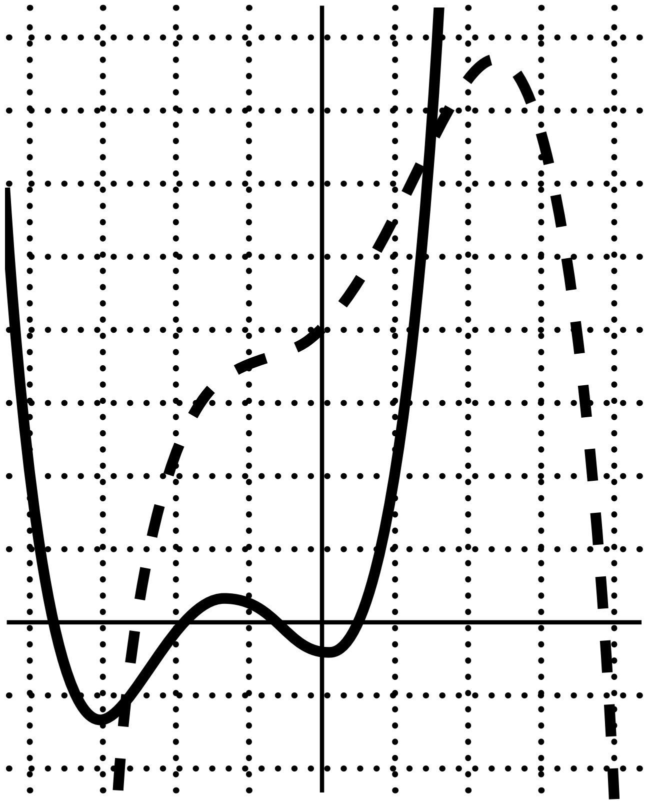
enthält Punkt (0|e)

0 bis 4 Nullstellen

a >0: beginnt fallend

a <0: beginnt steigend

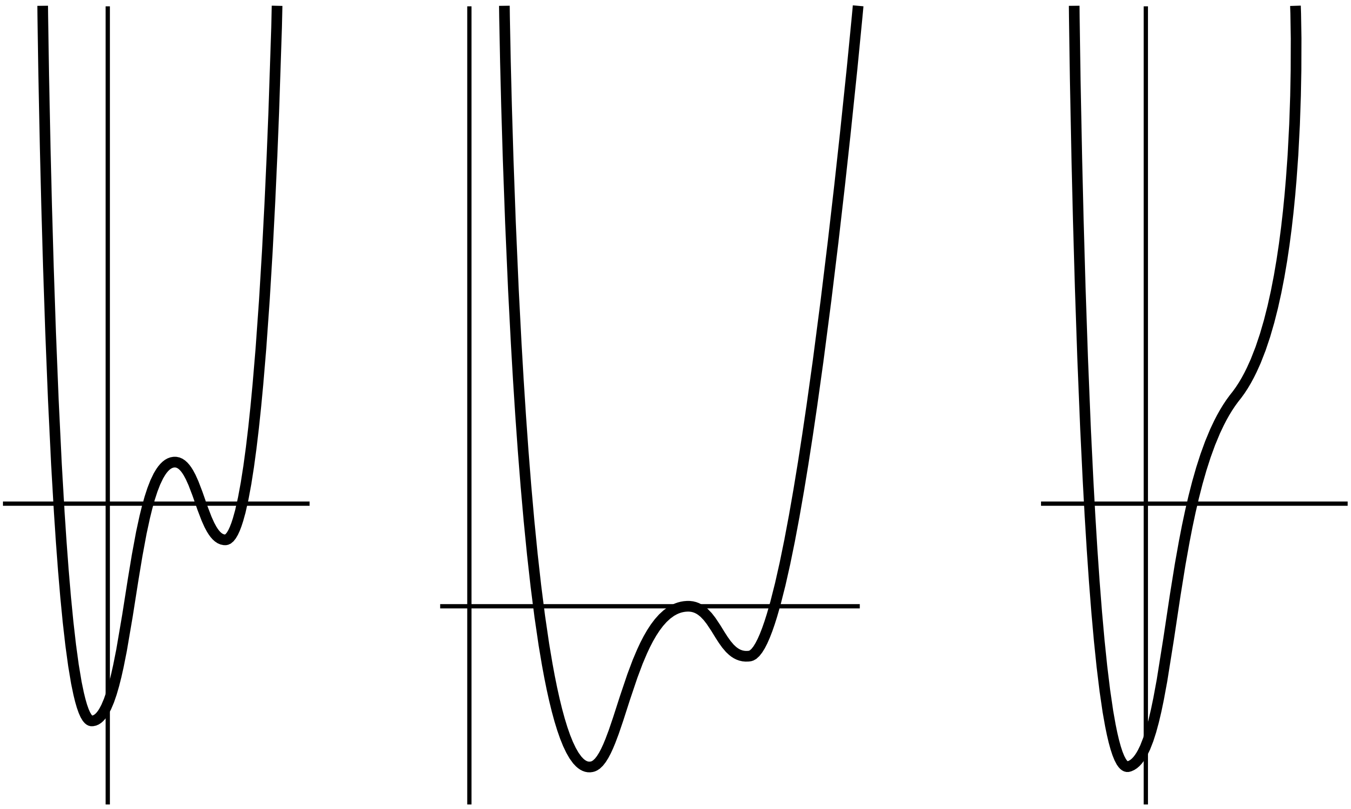




f_G4.2: f(x) =a *x^4 +b *x^3 +c *x^2 +d *x +e

Doppel-S-Kurve

verschiedenste Ausprägungen



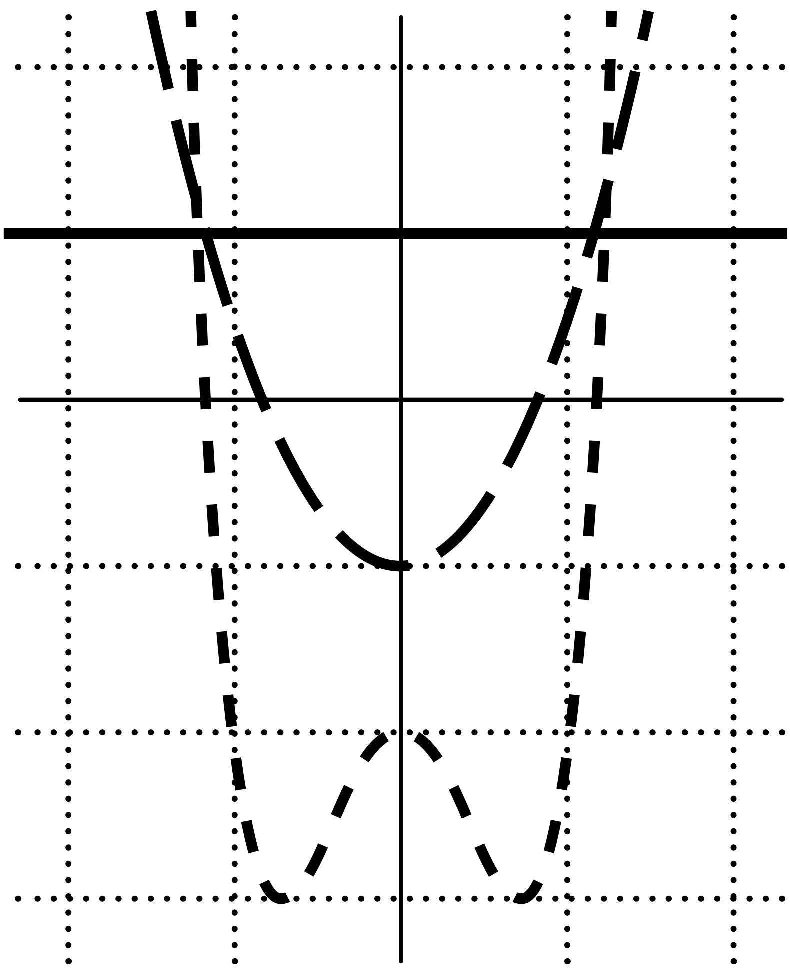
f_g: Hochzahl gerade

Symmetrisch zur senkrechten Achse, a <>0

f(x) =a *x^0 =a:

f(x) =a *x^2 +b:

f(x) =a *x^4 +b*x^2 +c:



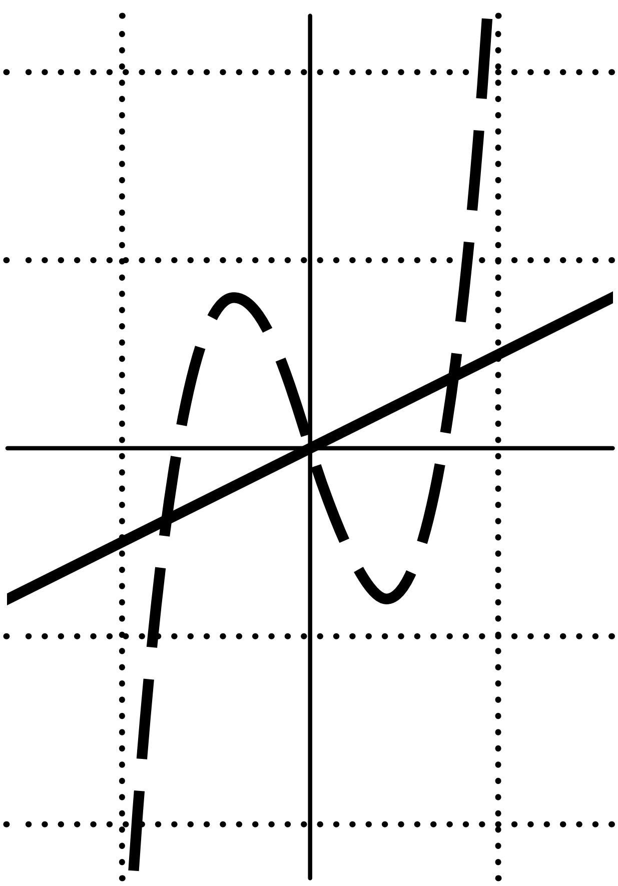
f_u: Hochzahl ungerade

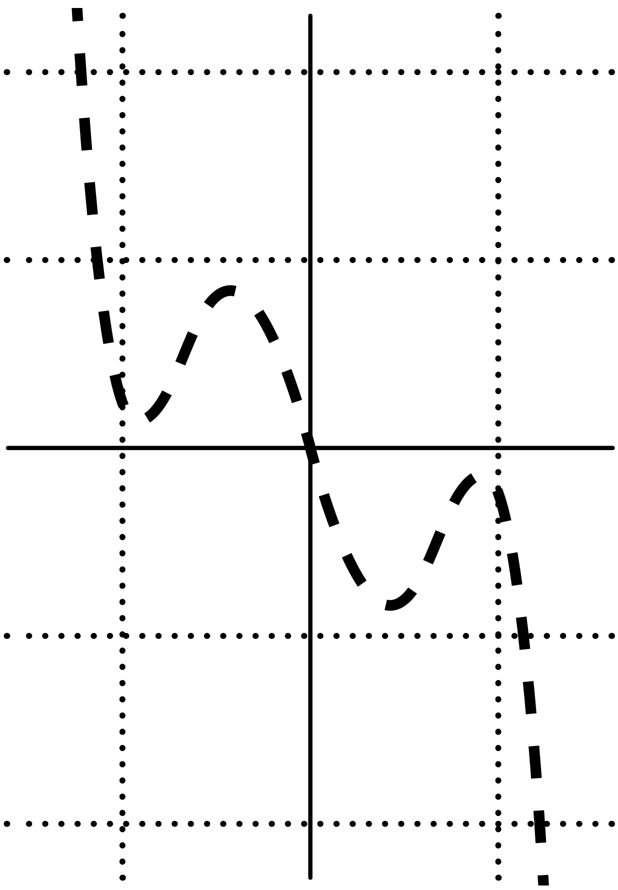
Symmetrisch zum Ursprung, a <>0

f(x) =a *x:

f(x) =a*x^3 +b*x:

f(x) =a *x^5 +b*x^3 +c*x:

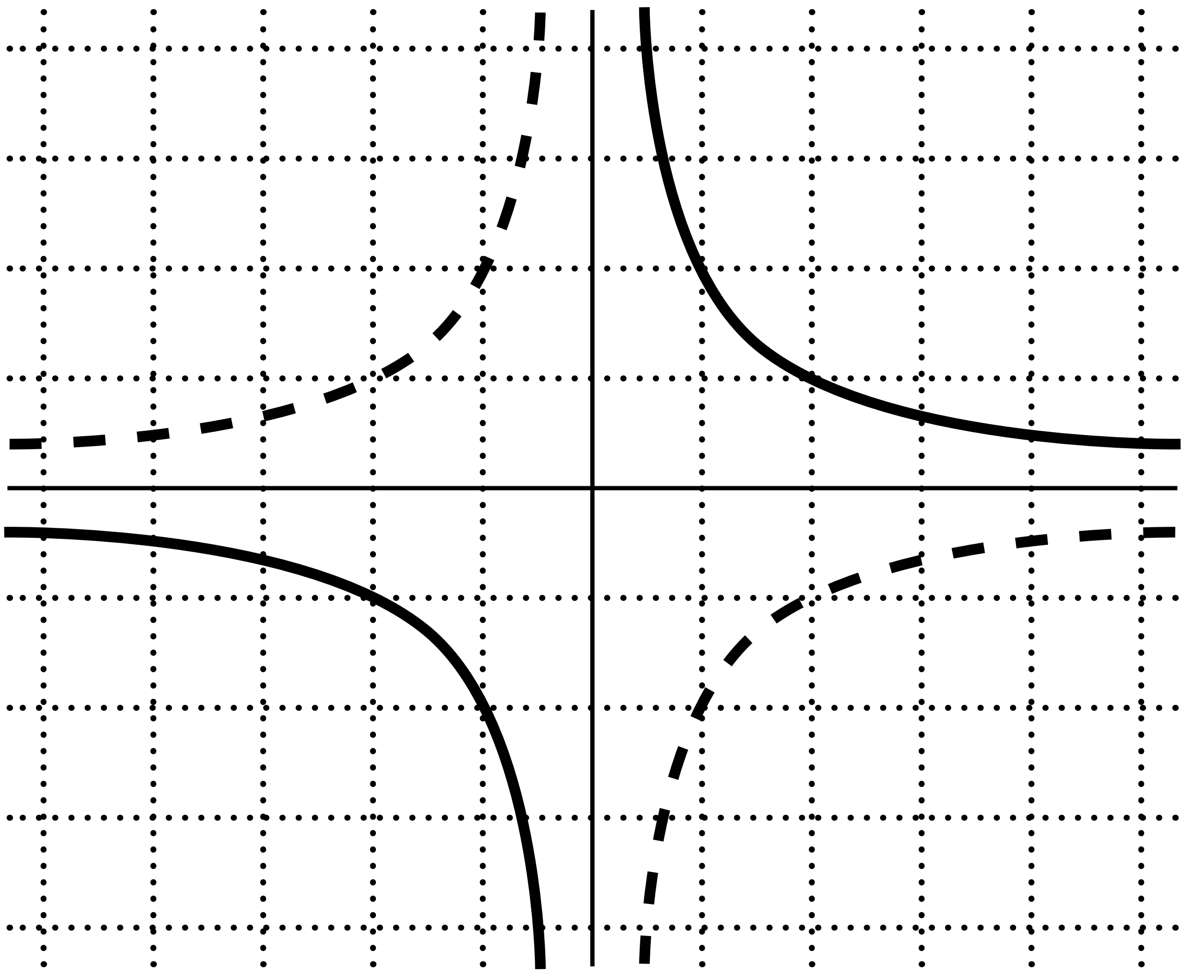




f_gebr1.1: f(x) =a/x

a >0 mit (1|a):

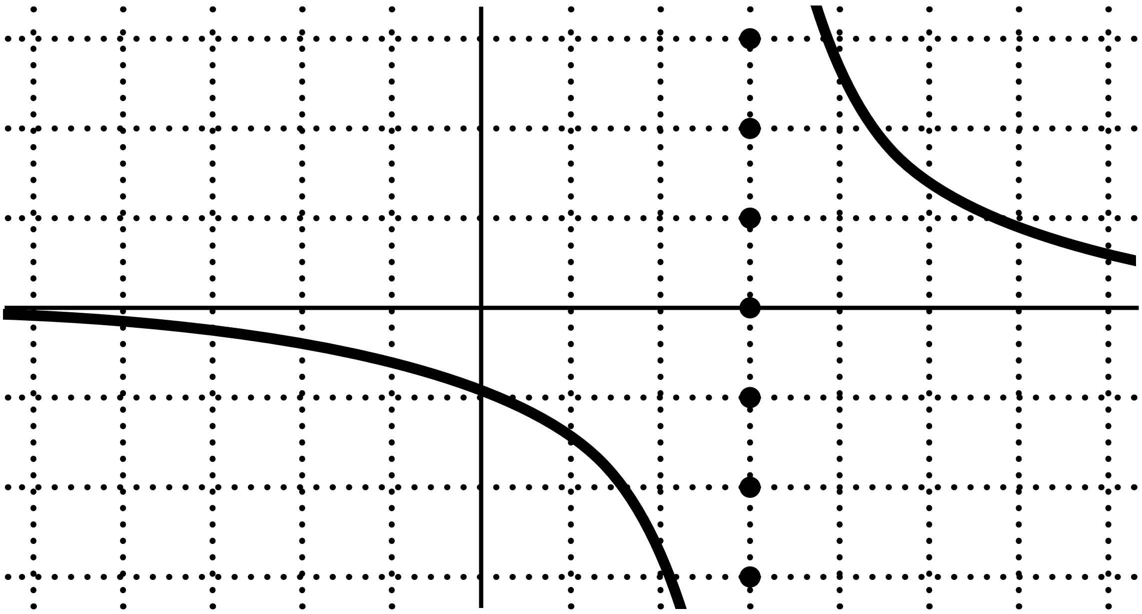
a <0 mit (-1|a):

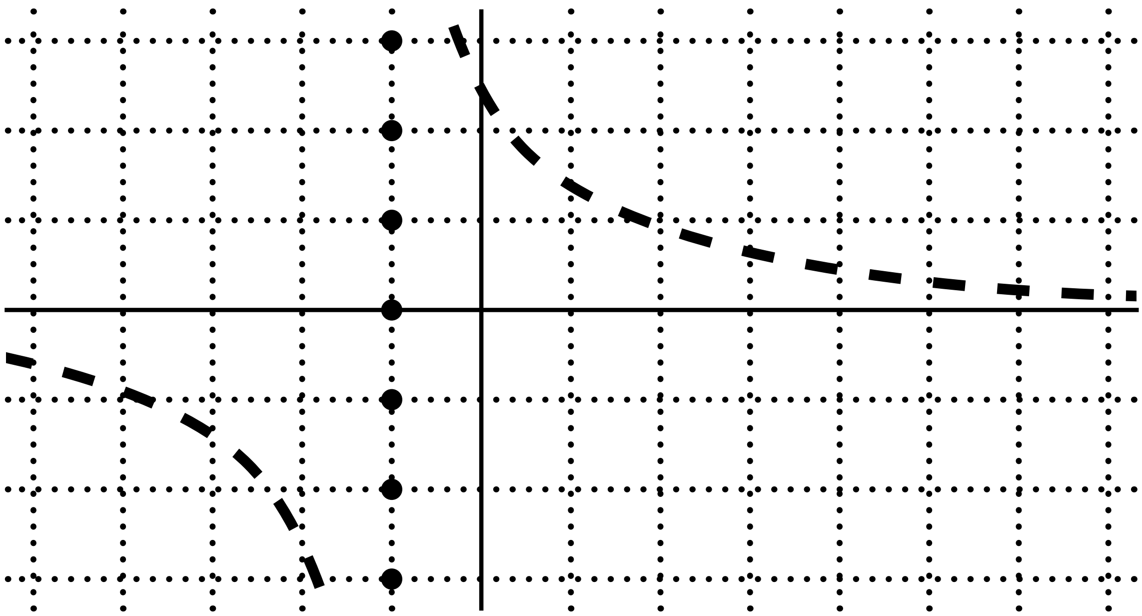


f_gebr1.2: f(x) =a/(x +b)

a >0, b<0:

a >0, b >0:

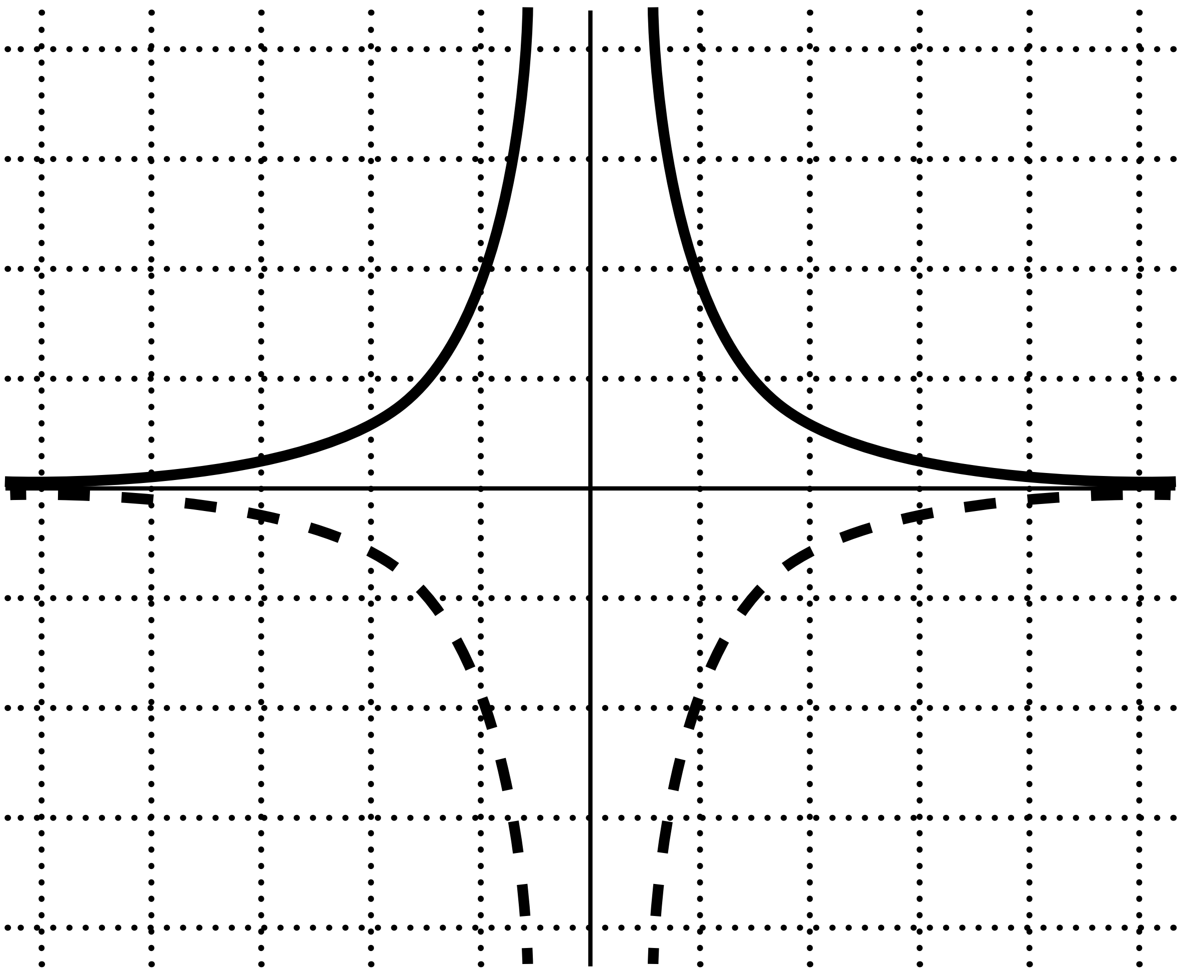




f_gebr2.1: f(x) =a/x^2

a >0:

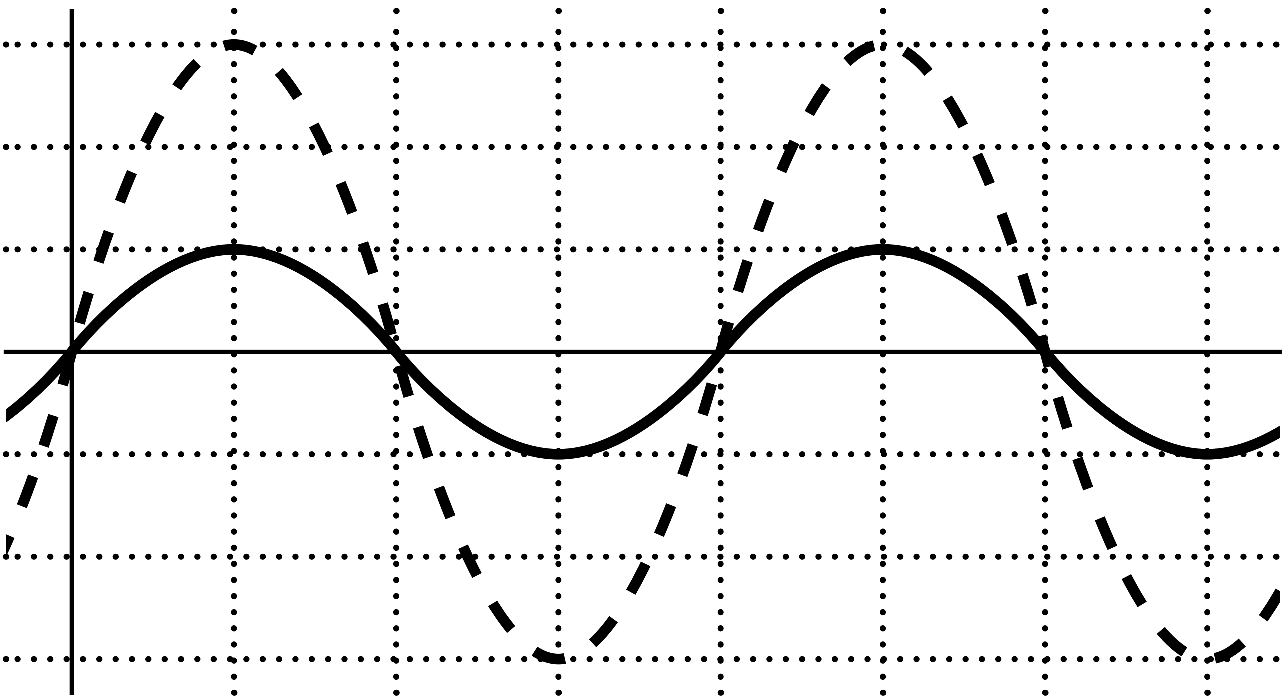
a <0:



f_sin.1: f(x) =a *'sin(x)

a =1:

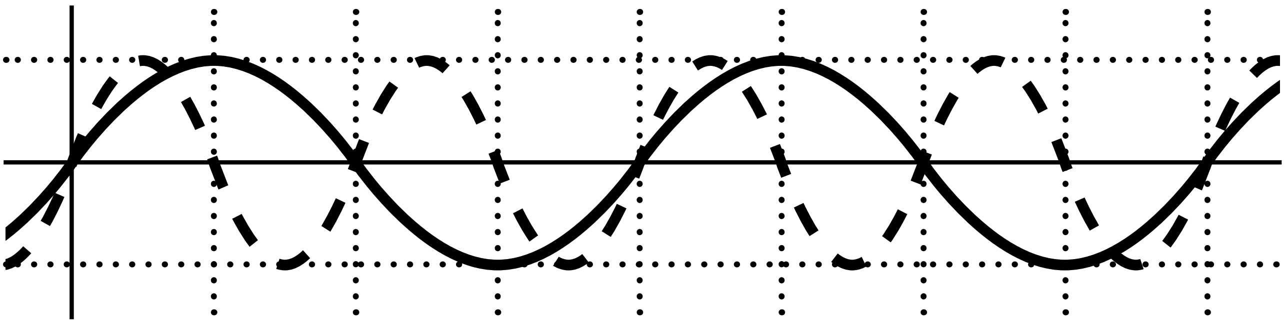
a =3:



f_sin.2: f(x) ='sin(b *x)

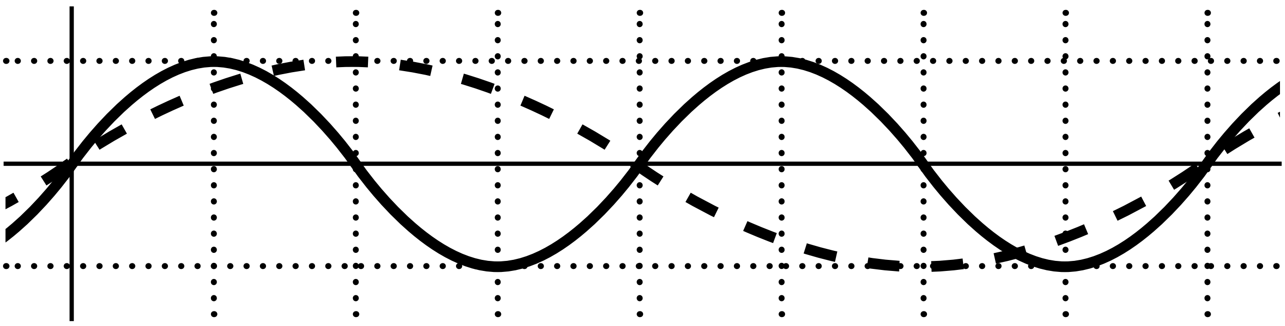
b =1:

b =2:



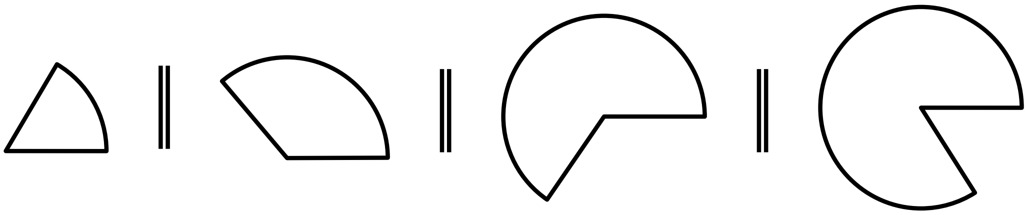
b =1:

b =1/2:

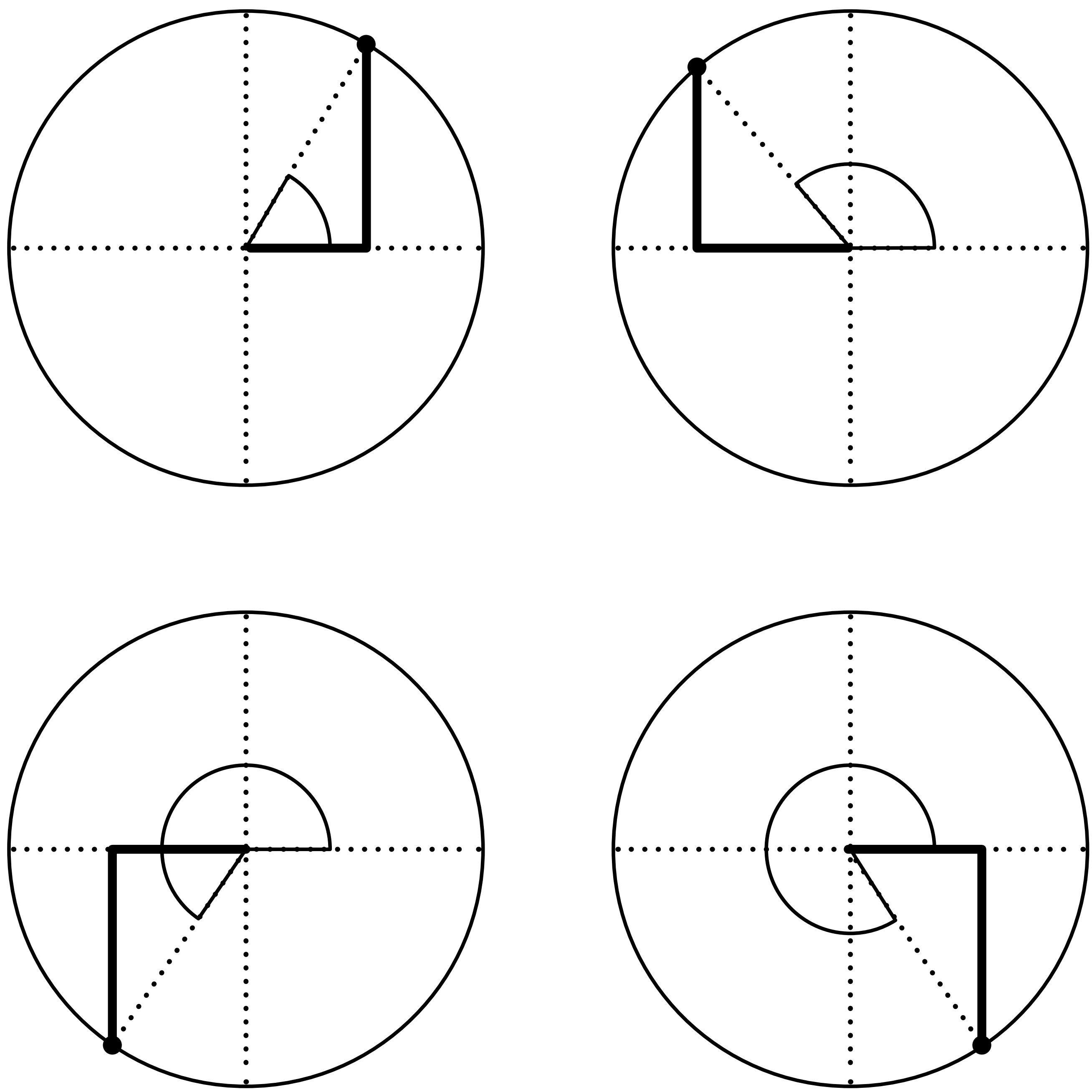


EK (r =1) ______________

'al:



P('cos('al)|'sin('al)):



Vektoren in R^2

Schulstufe 09

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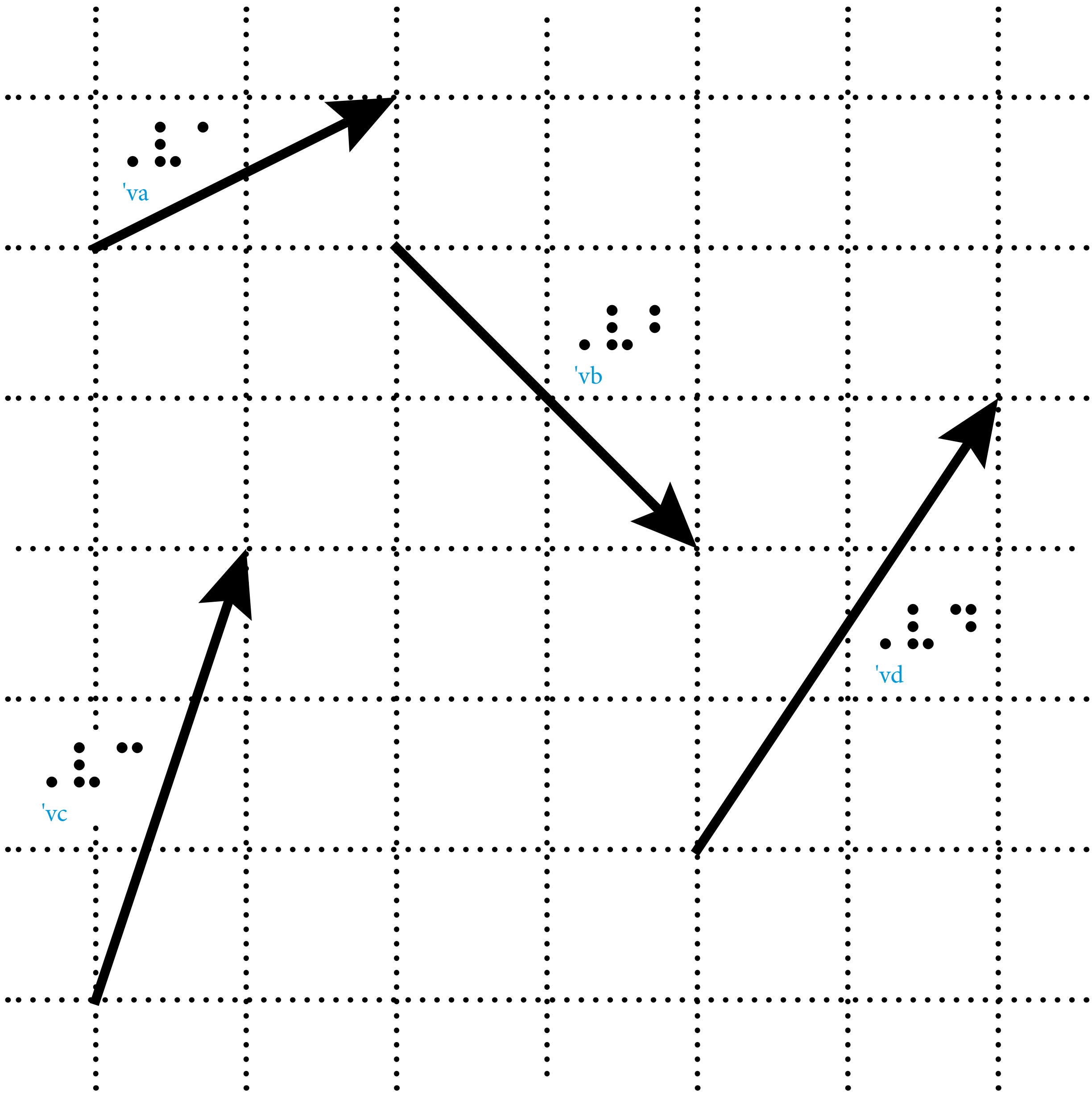
St 09 Vektoren in R^2, 1/15

Verschiedene Vektoren

'va =(2|1); 'vb =(2|-2);

'vc =(1|3); 'vd =(2|3)

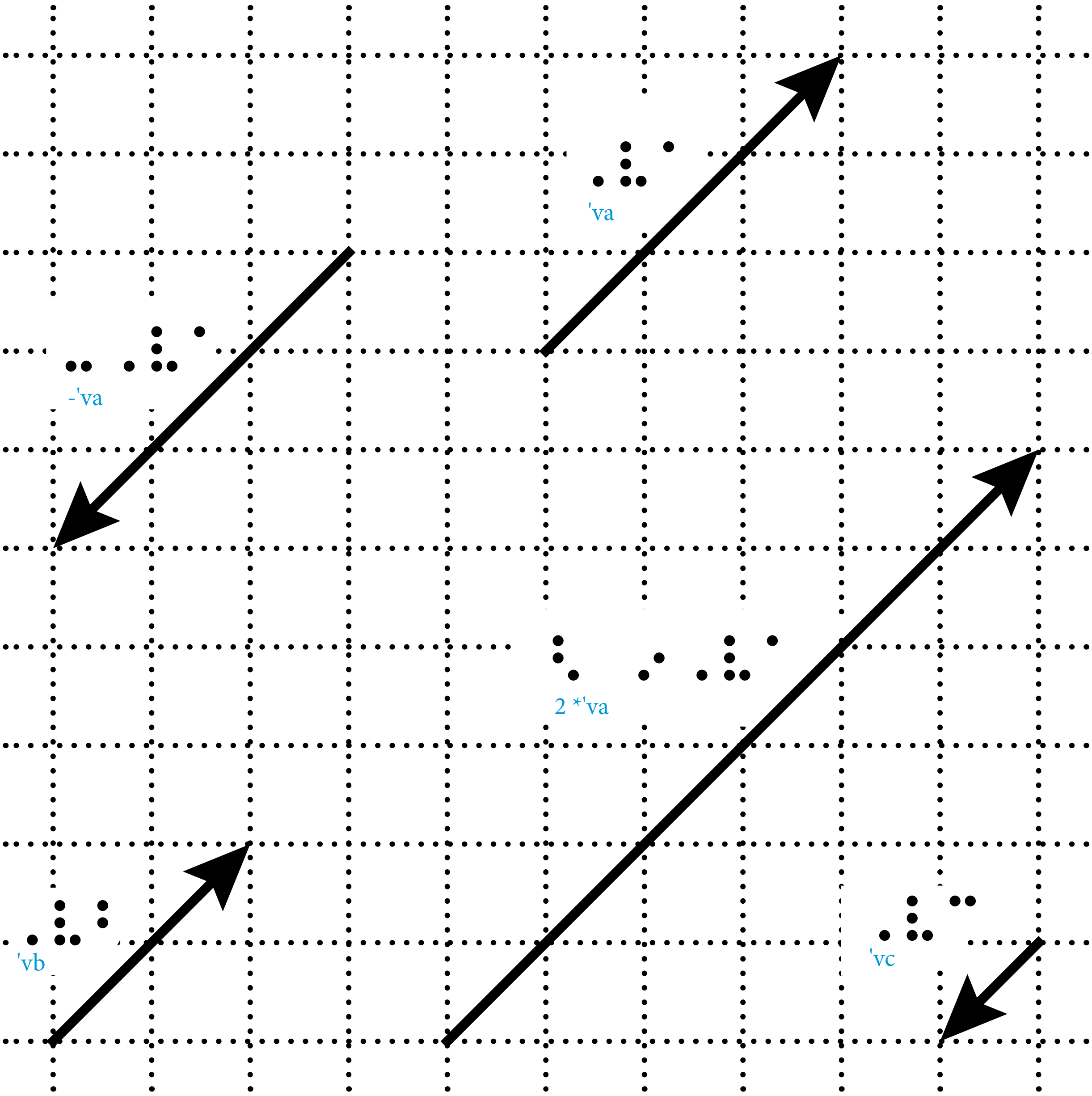


St 09 Vektoren in R^2, 2/15

Parallele Vektoren:

gleich- oder entgegengesetzt gerichtet

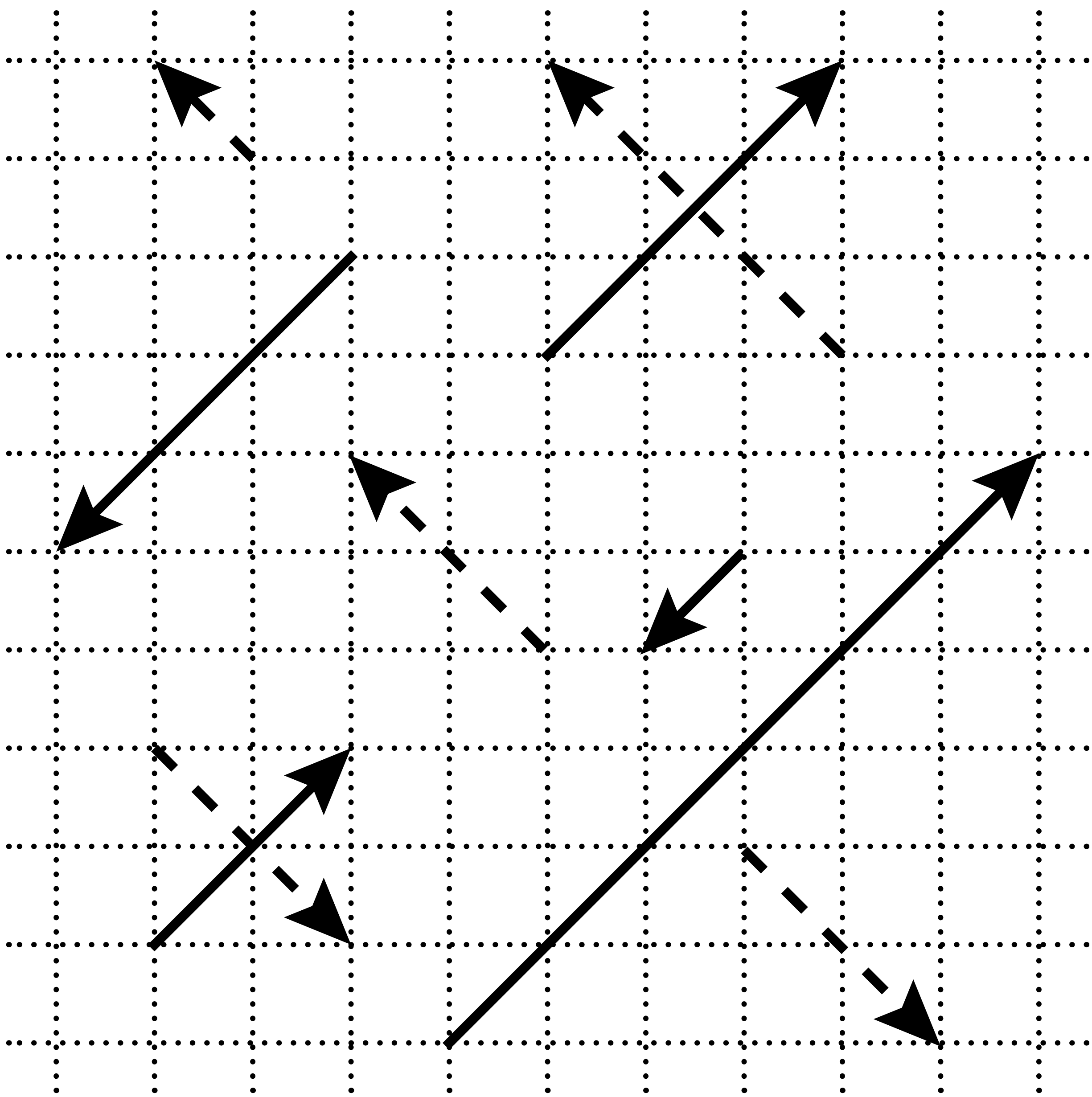
'va =(3|3); 'vb =2/3 *'va; 'vc =-1/3 *'va



Parallele Vektoren: 

Normalvektoren dazu: 

Normalvektoren dazu sind zueinander ebenfalls parallel.

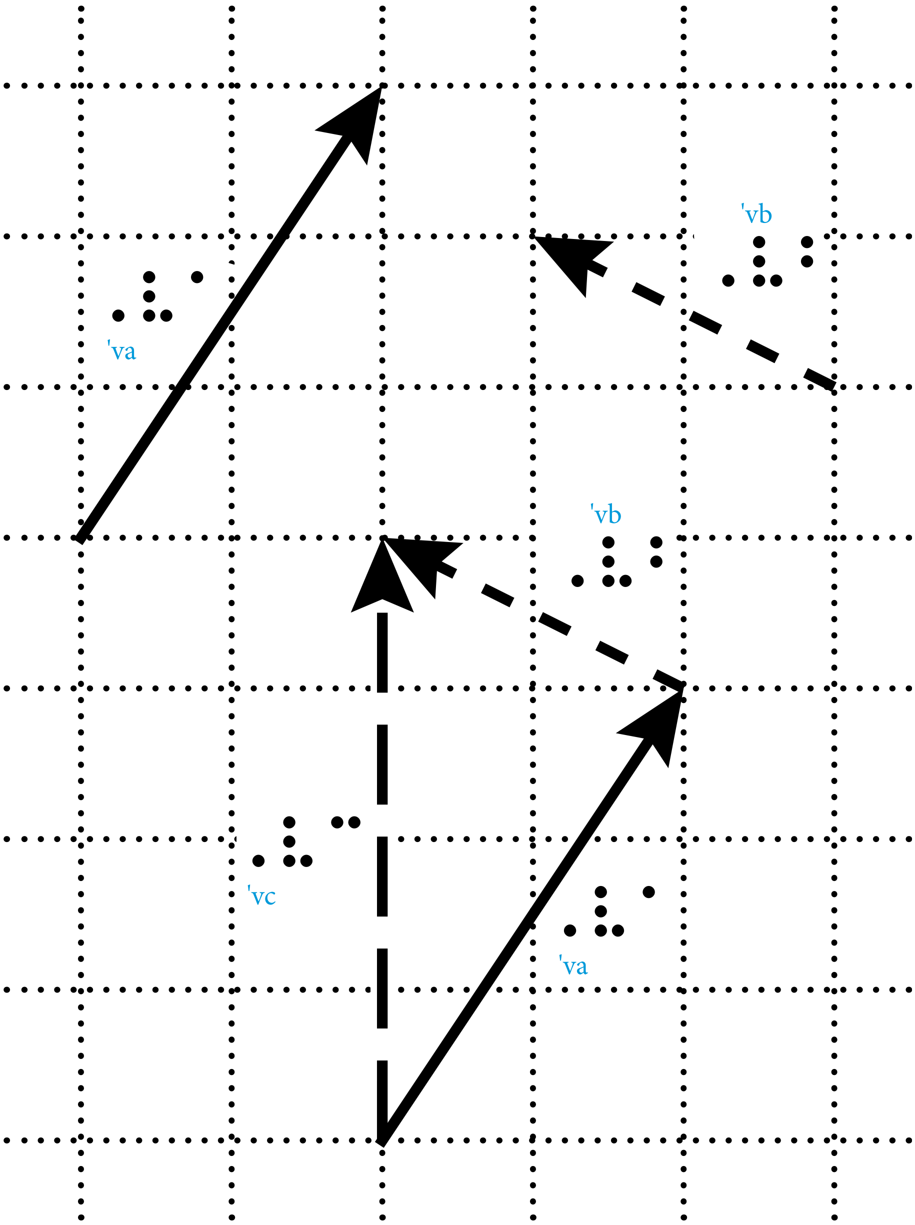


Vektoraddition

'va:

'vb:

'va +'vb ='vc:



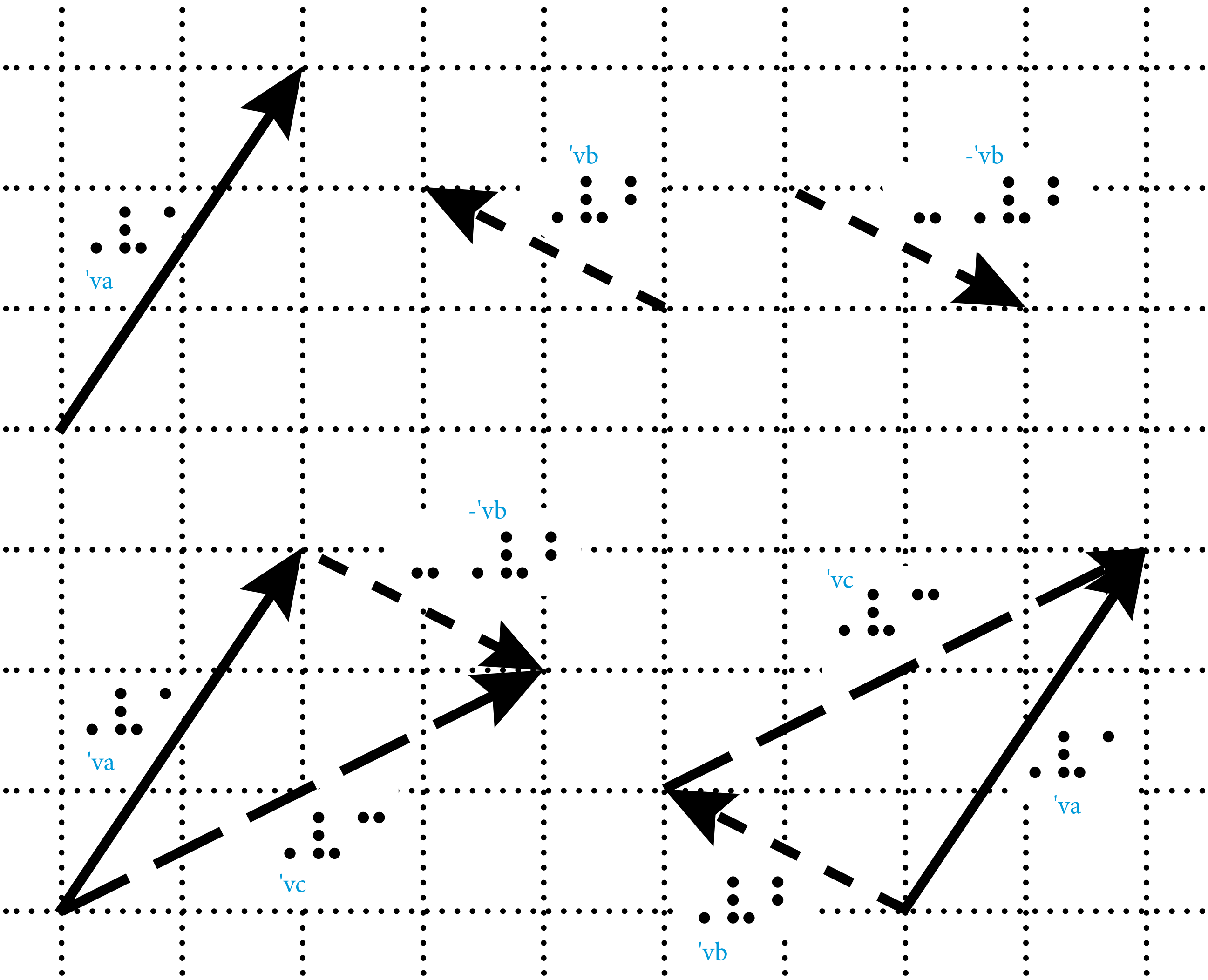
Vektorsubtraktion

'va:

'vb:

'vc:

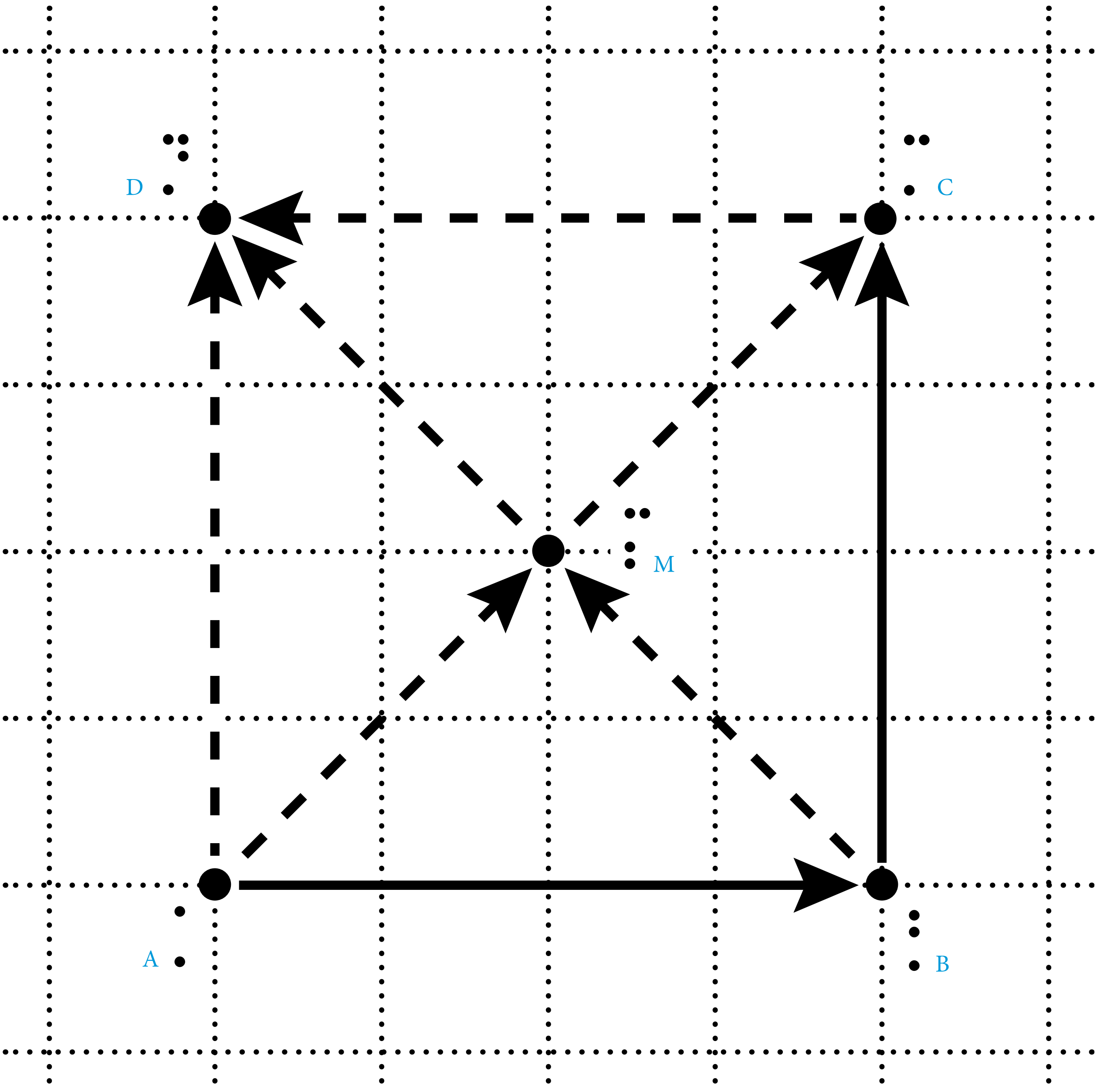
'vc ='va +(-'vb) ='va -'vb



Quadrat

Geg. A, B, C

Ges. D, M

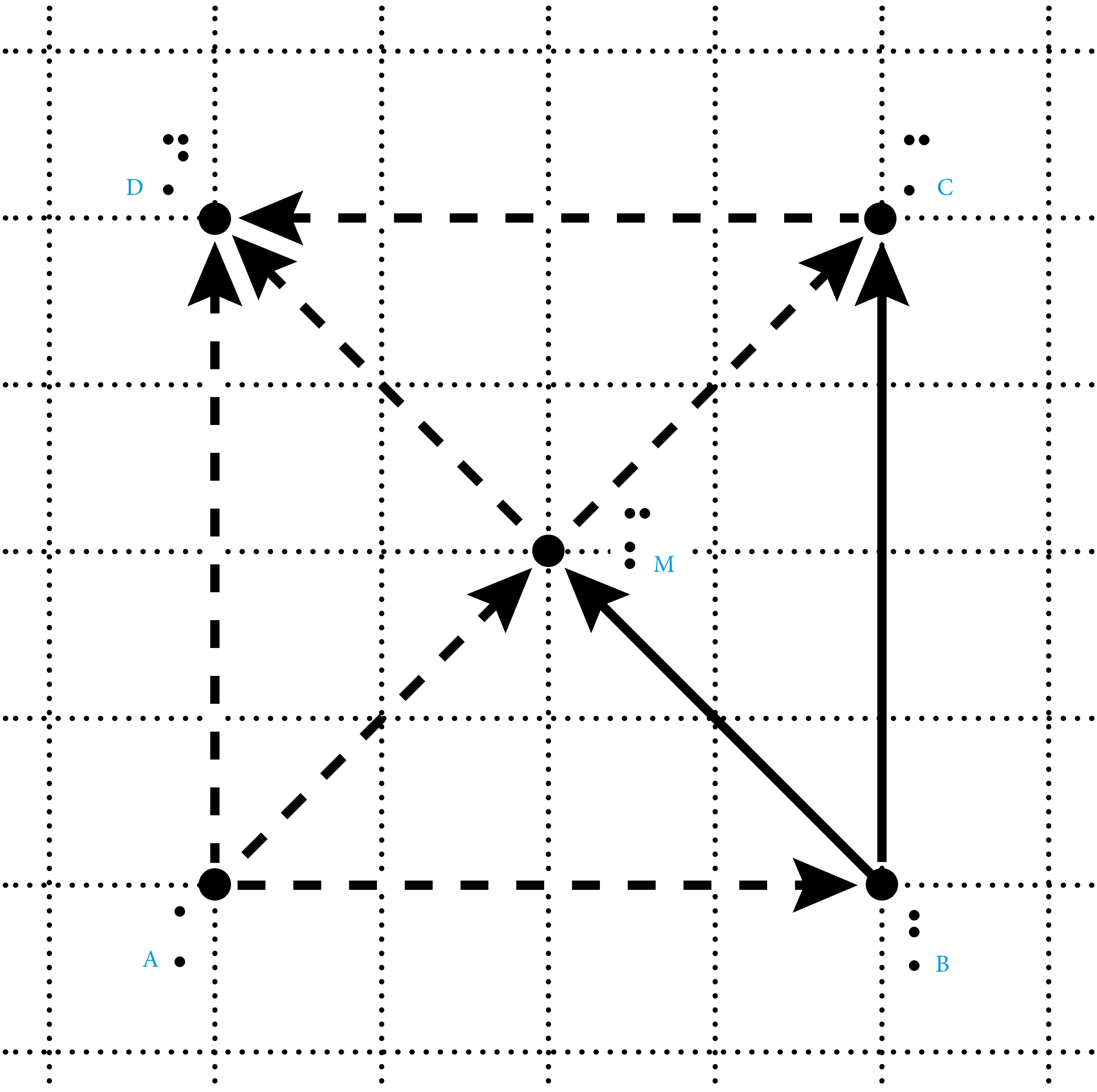


St 09 Vektoren in R^2, 7/15

Quadrat

Geg. B, M, 'vBC

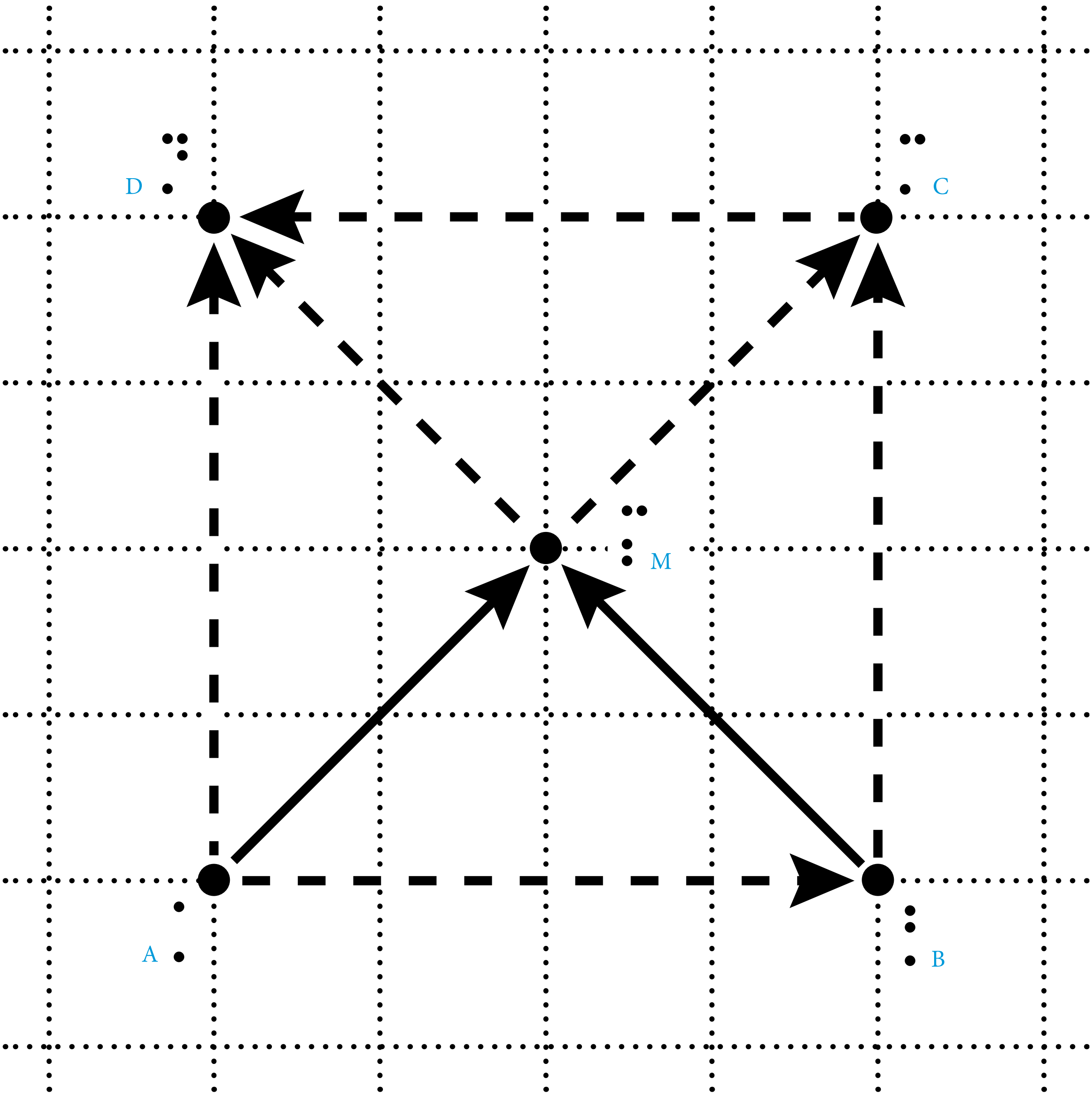
Ges. A, D



Quadrat

Geg. A, 'vAM, 'vBM

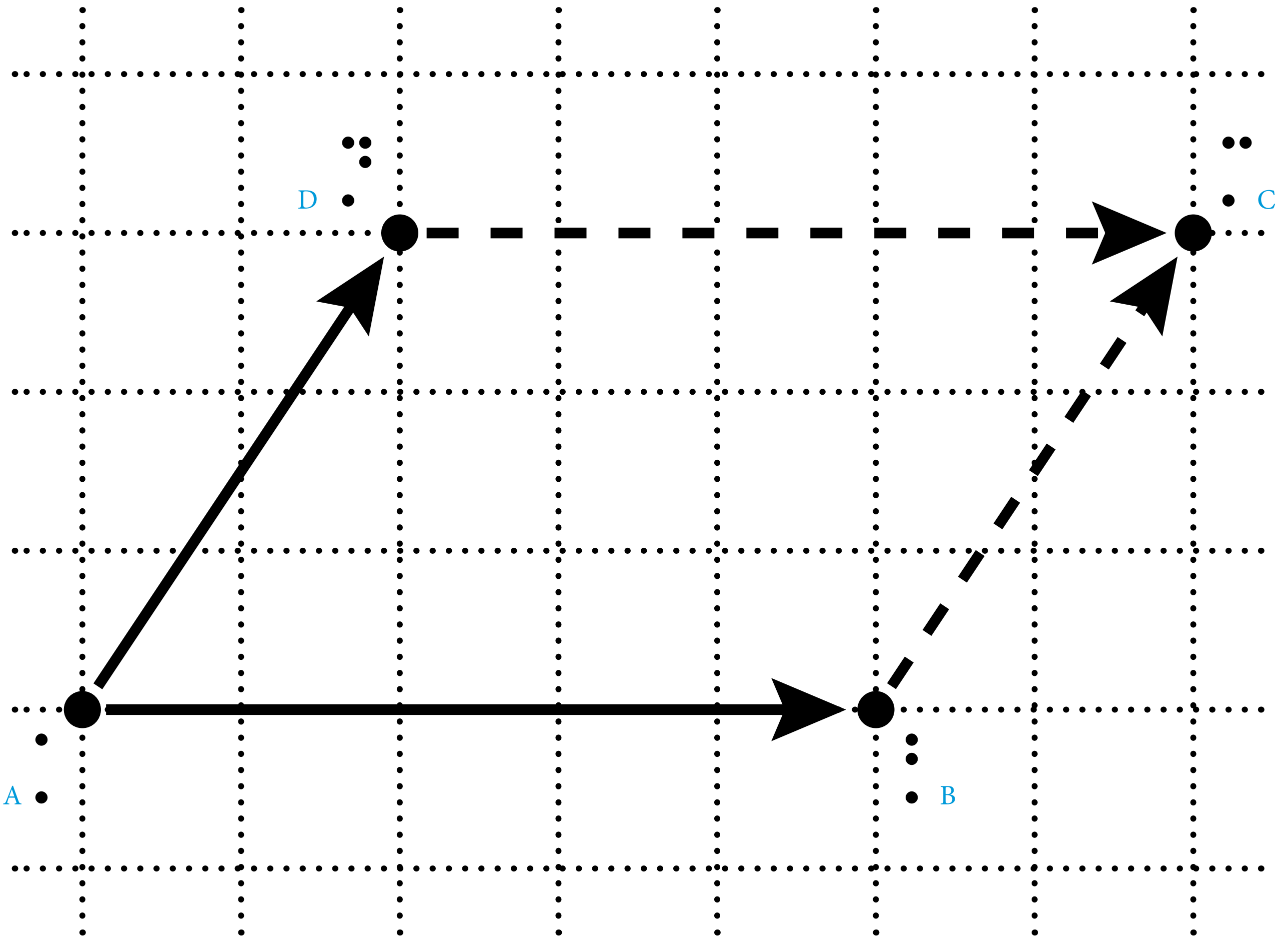
Ges. C, D



Parallelogramm

Geg. A, 'vAB, 'vAD

Ges. B, C, D

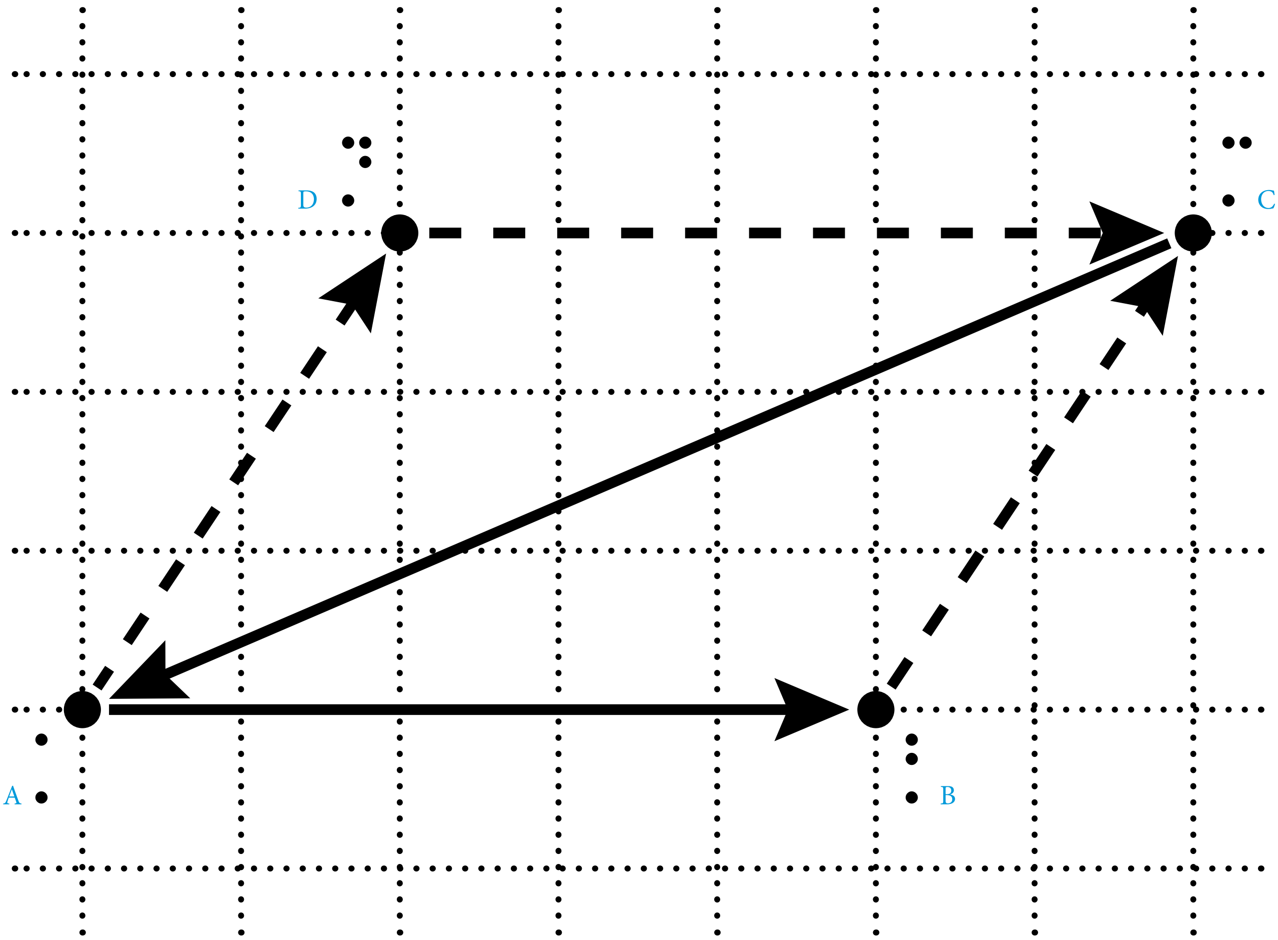


St 09 Vektoren in R^2, 10/15

Parallelogramm

Geg. A, 'vAB, 'vCA

Ges. B, C, D

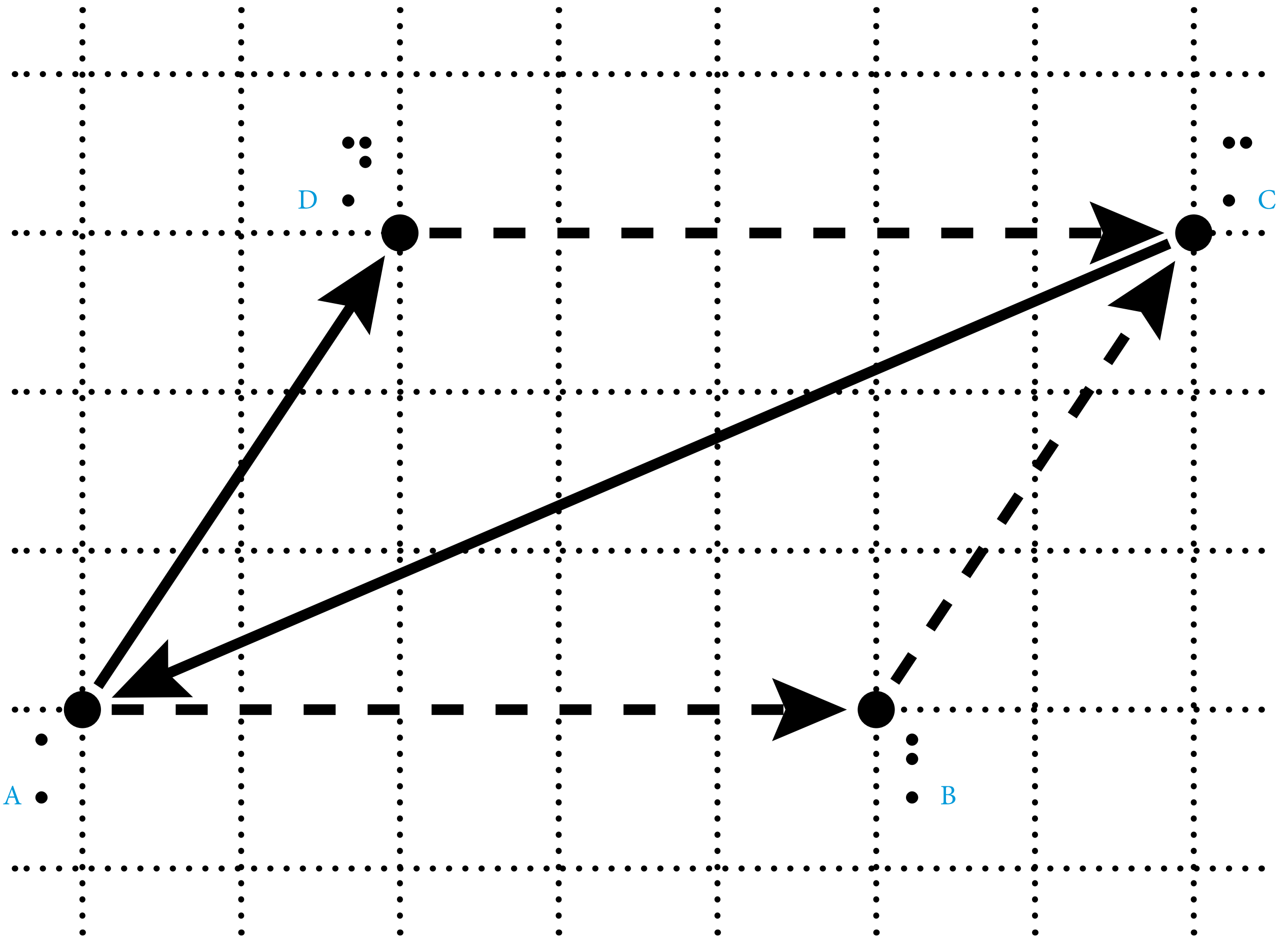


St 09 Vektoren in R^2, 11/15

Parallelogramm

Geg. A, 'vAD, 'vCA

Ges. B, C, D

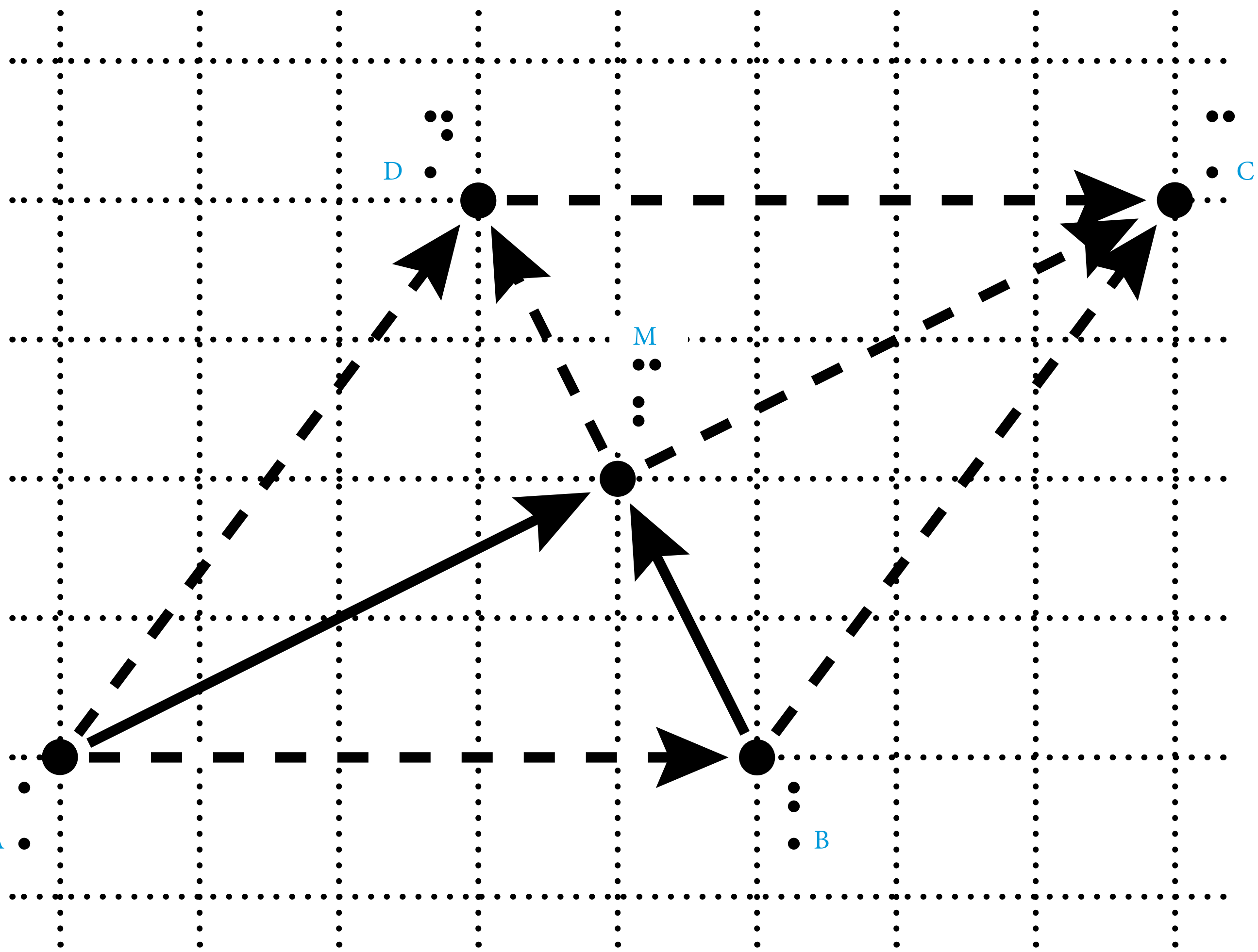


St 09 Vektoren in R^2, 12/15

Rhombus (Raute)

Geg. A, 'vAM, 'vBM

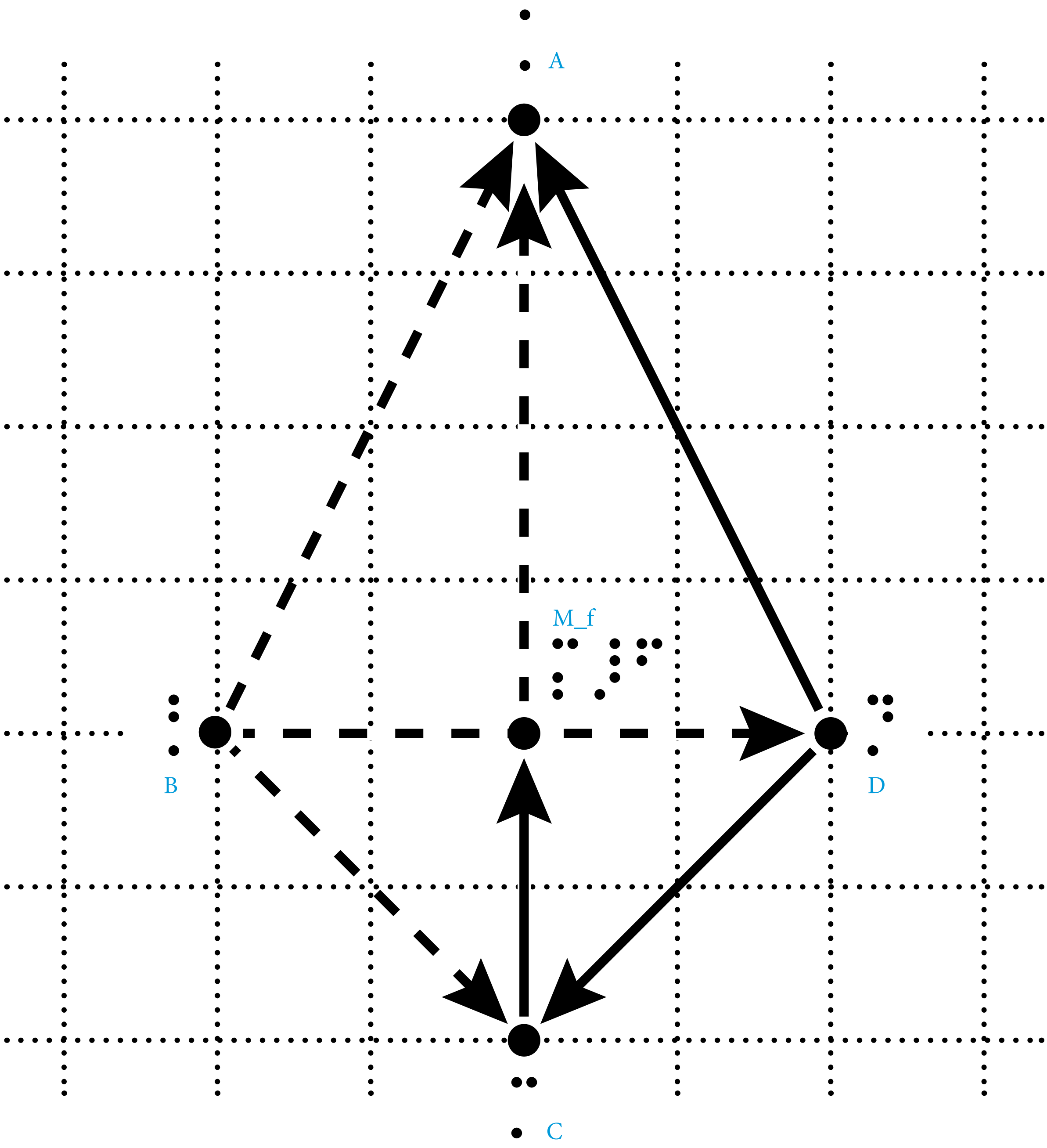
Ges. B, C, D



Deltoid

Geg. A, C, D, M_f

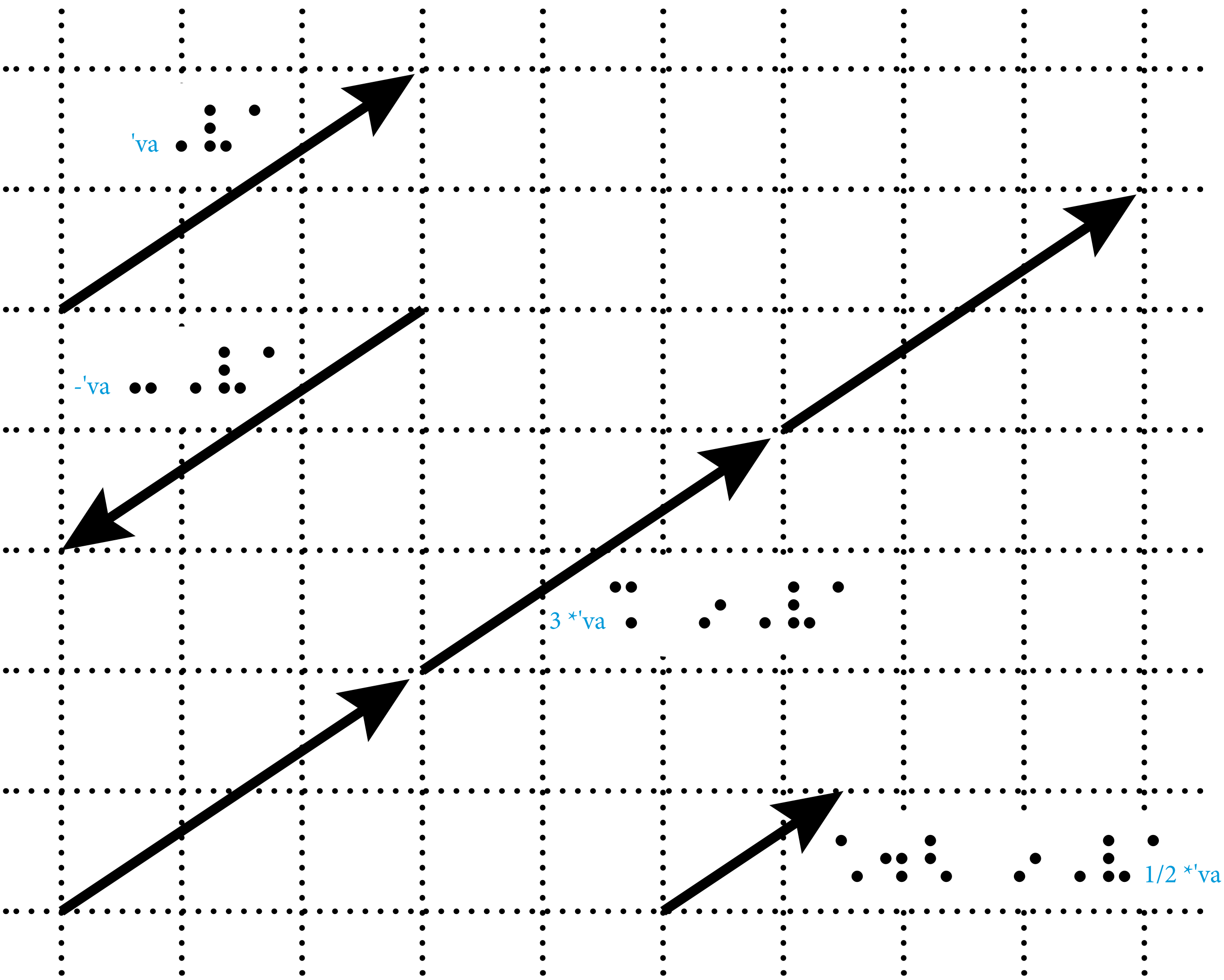
Ges. B



St 09 Vektoren in R^2, 14/15

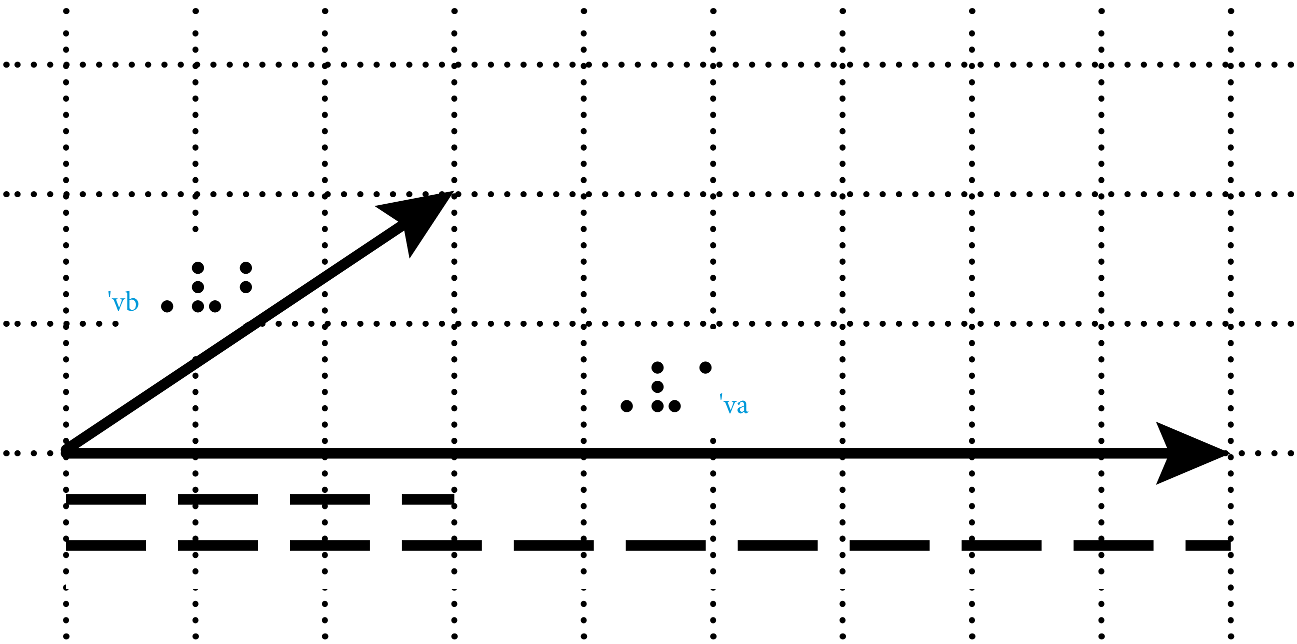
Mult. mit einem Skalar

'va; -'va; 3 *'va; 1/2 *'va



Skalarprodukt

'va *'vb =Länge des Vektors 'va mal Länge der Normalprojektion des Vektors 'vb auf 'va



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