



Bundes-
Blindeninstitut
Wien

LeMa
Lehr- und Lernmaterialien

Vergrößerte und aufbereitete Versionen
ausgewählter Grafiken aus dem Schulbuch

Angewandte Mathematik HAK 2



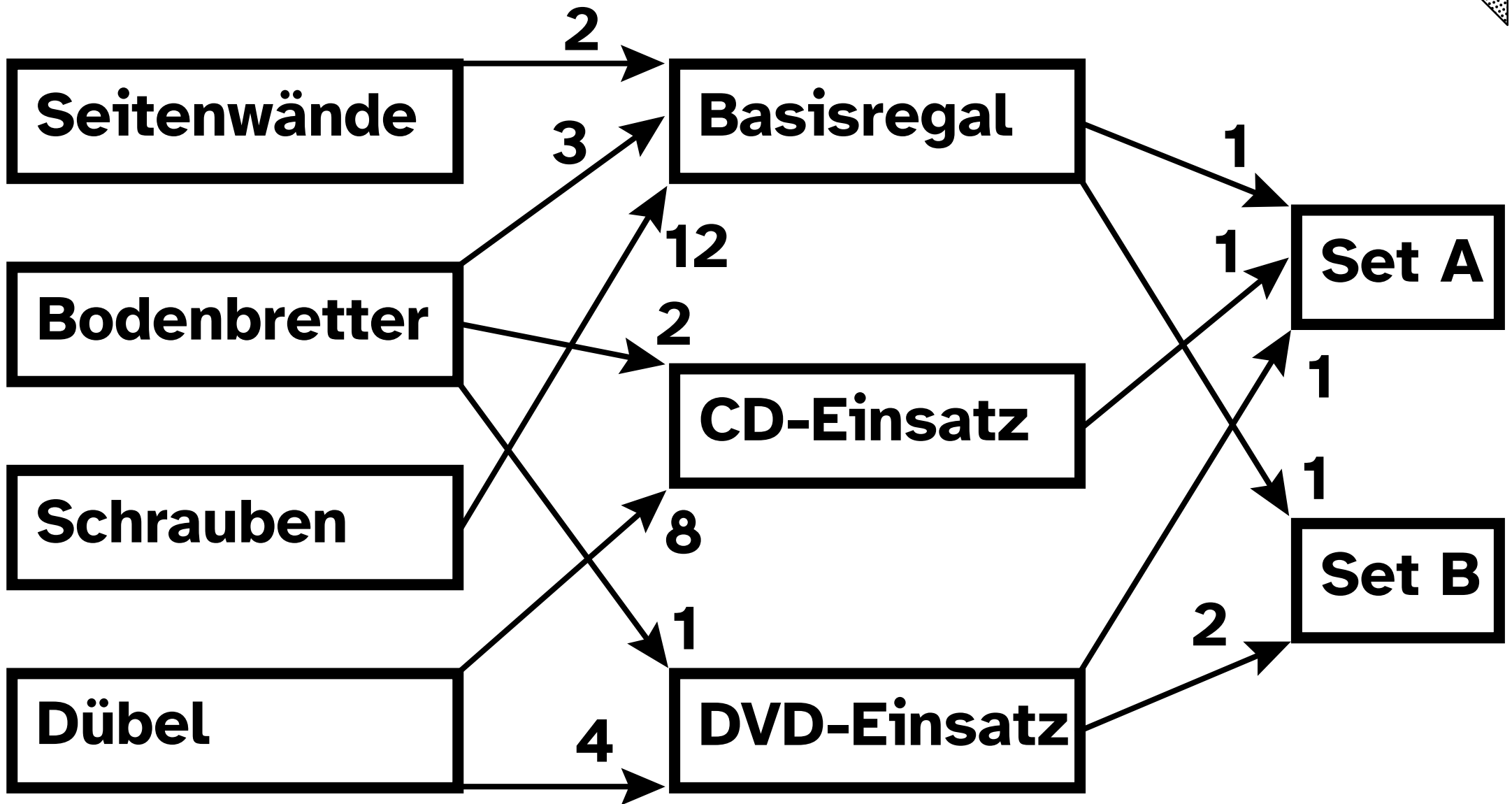
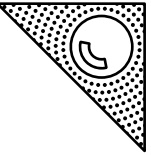
Grafiken: Tomáš Batha

LEMA - Lehr- und Lernmaterialien
Hergestellt von der Abteilung für Inklusion und Lehrmittel am Bundes-Blindeninstitut Wien,
Wittelsbachstraße 5, 1020 Wien, Tel.: 01/728 08 66-405, 406, lmz@bbi.at, www.bbi.at

Angewandte Mathematik
HAK Band 2

2.

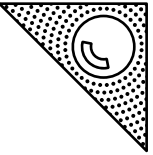
Matrizen



Bestandteile

Zwischenprodukte

Endprodukte



Schrank A

Schrank B

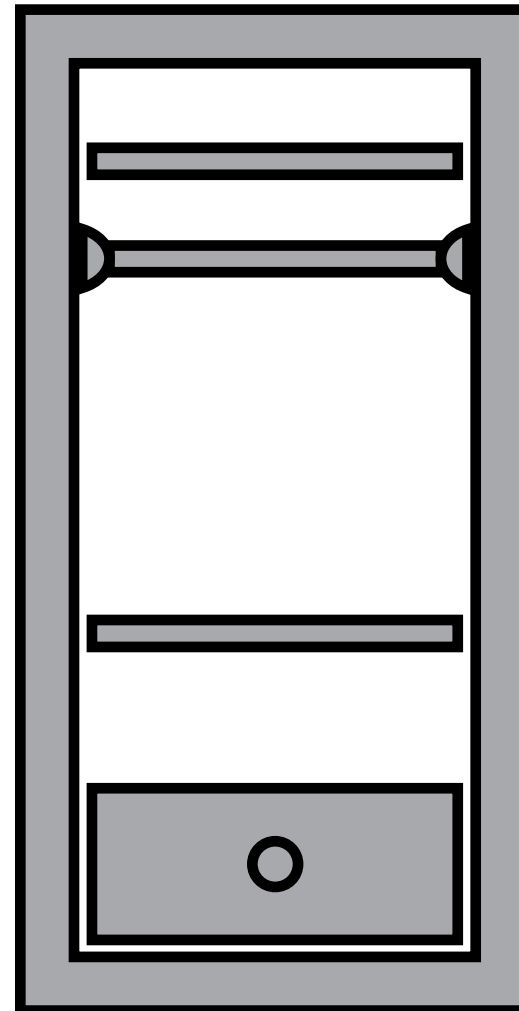
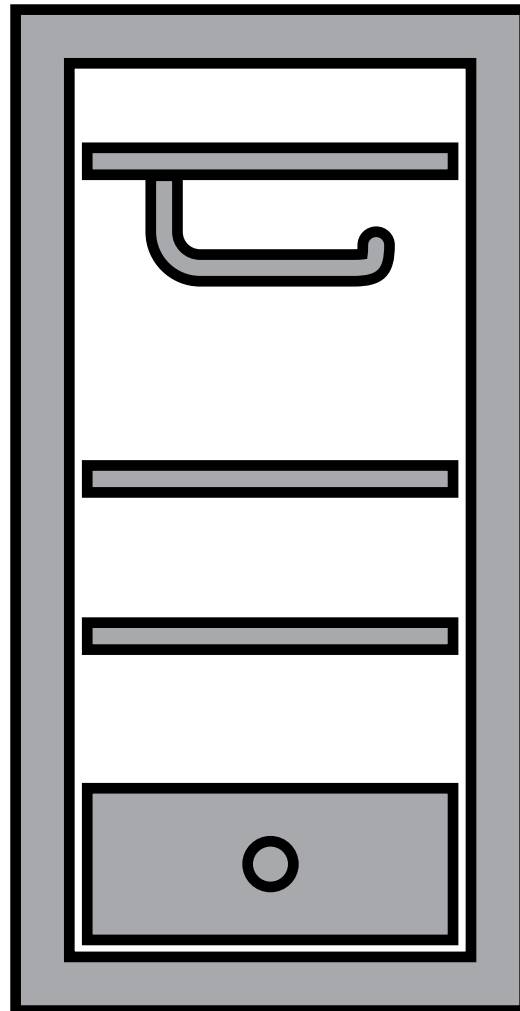
Regalboden

Hosenaufh.

Regalboden

Regalboden

Schublade

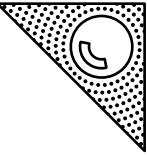


Regalboden

Kleiderst.

Regalboden

Schublade

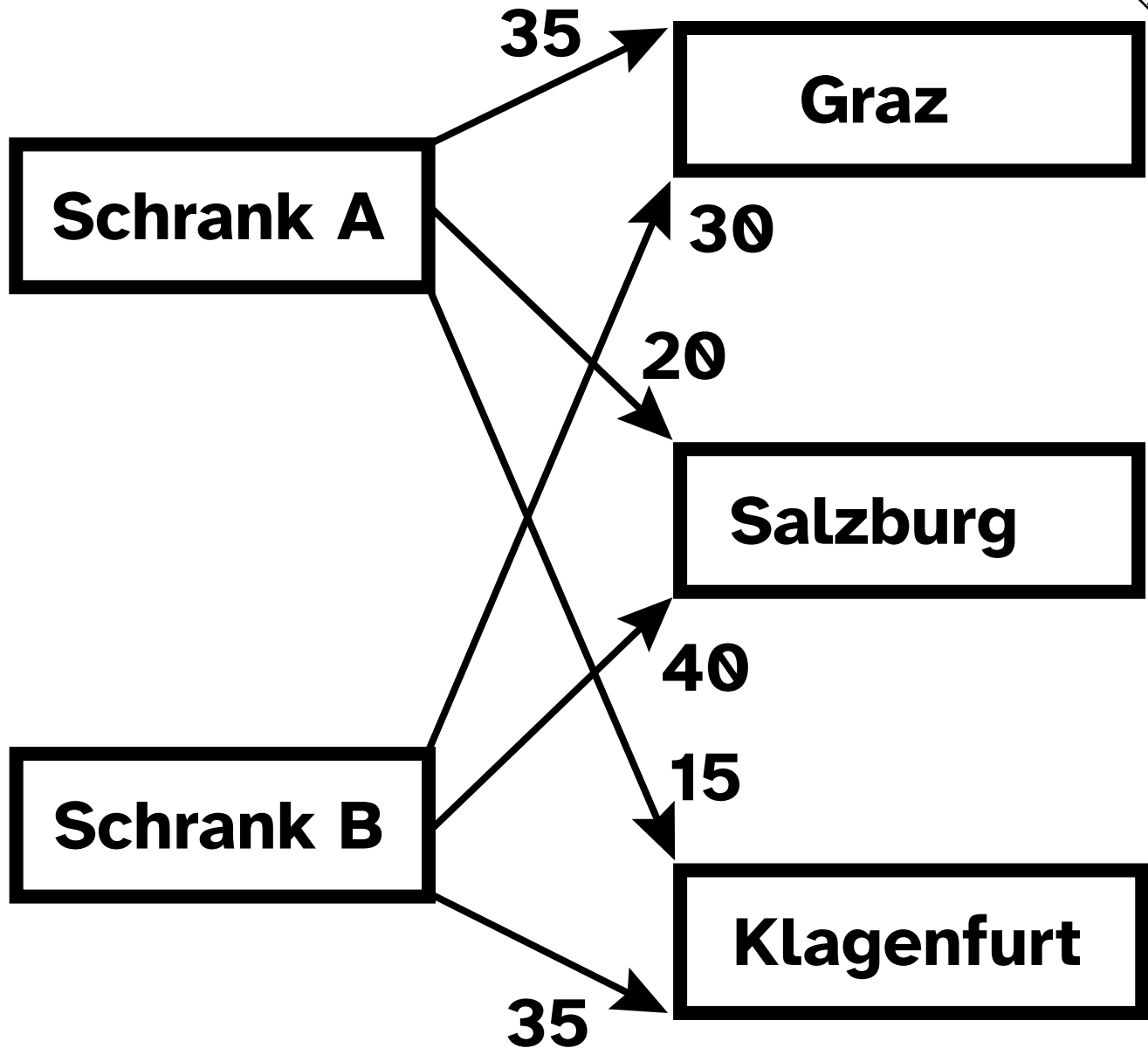


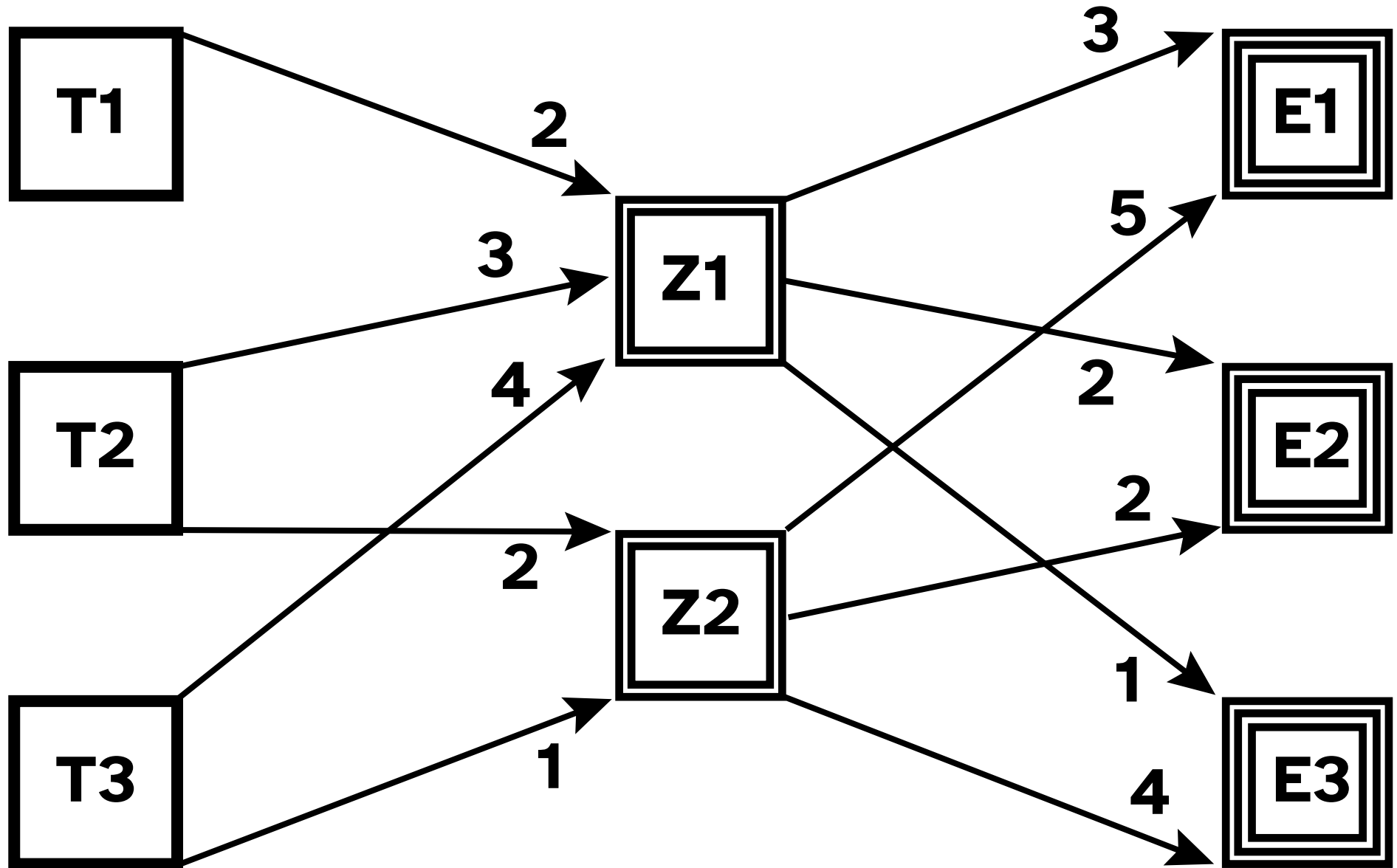
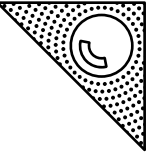
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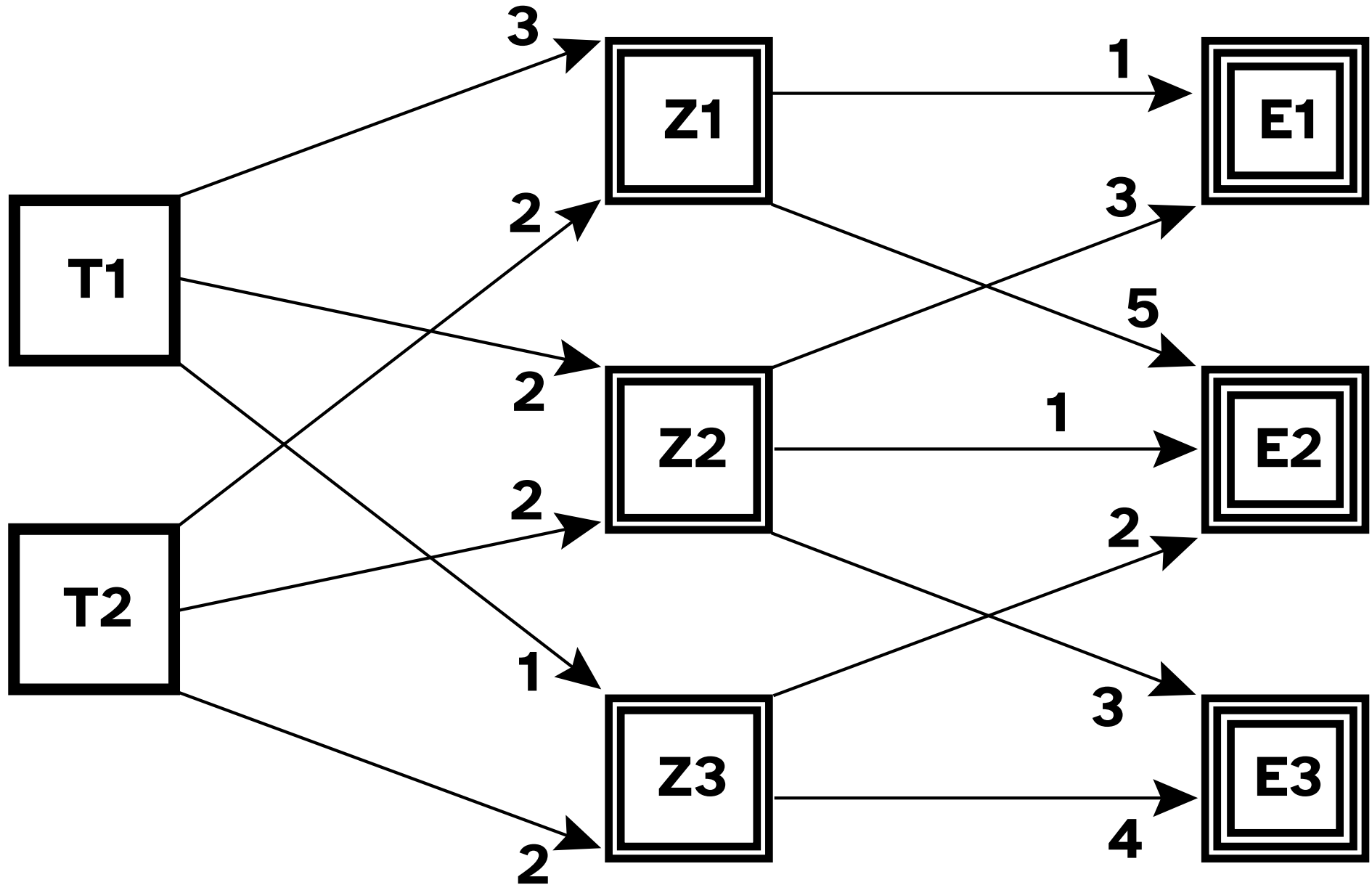
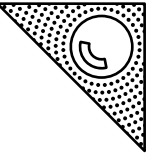
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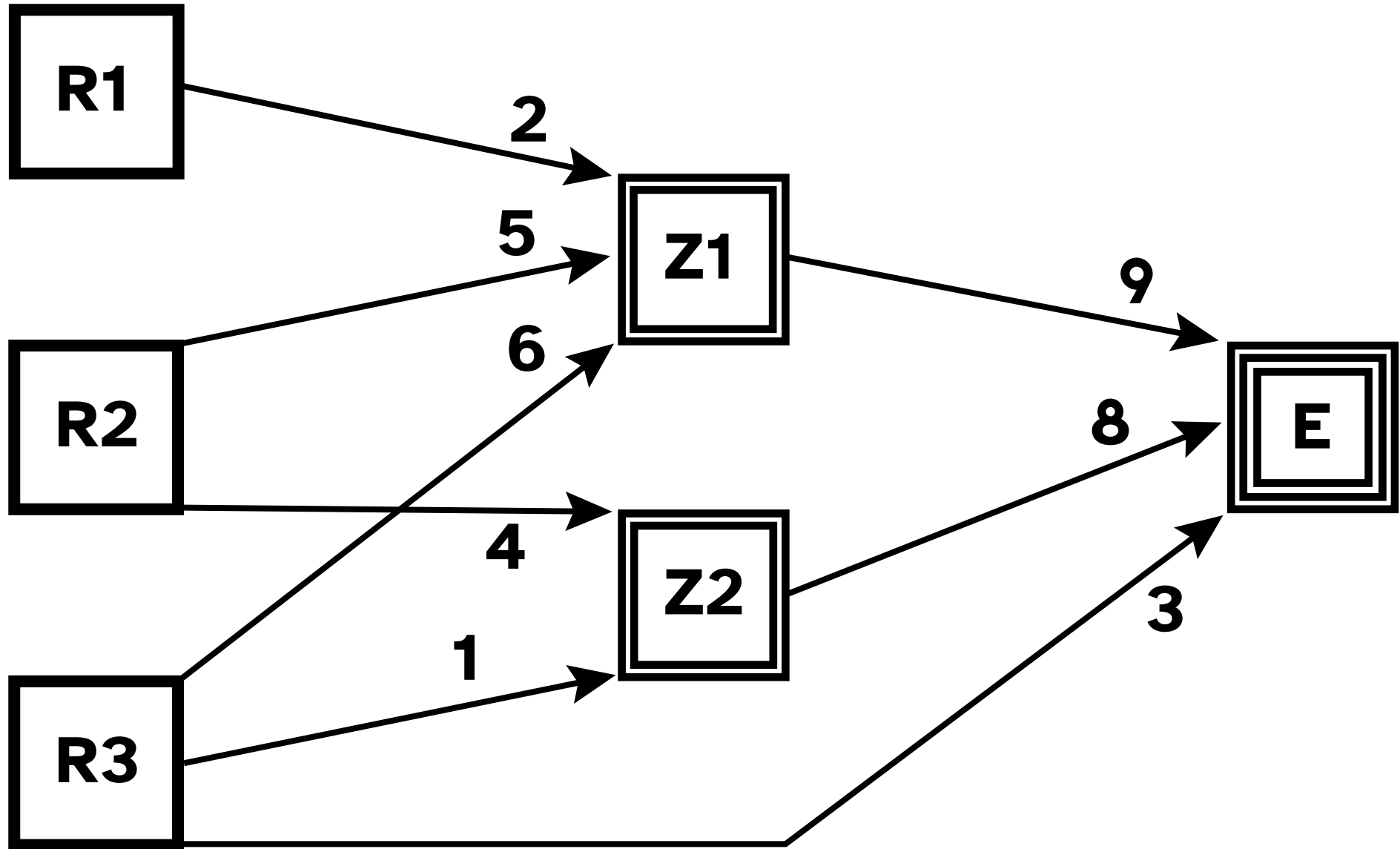
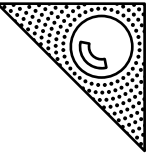
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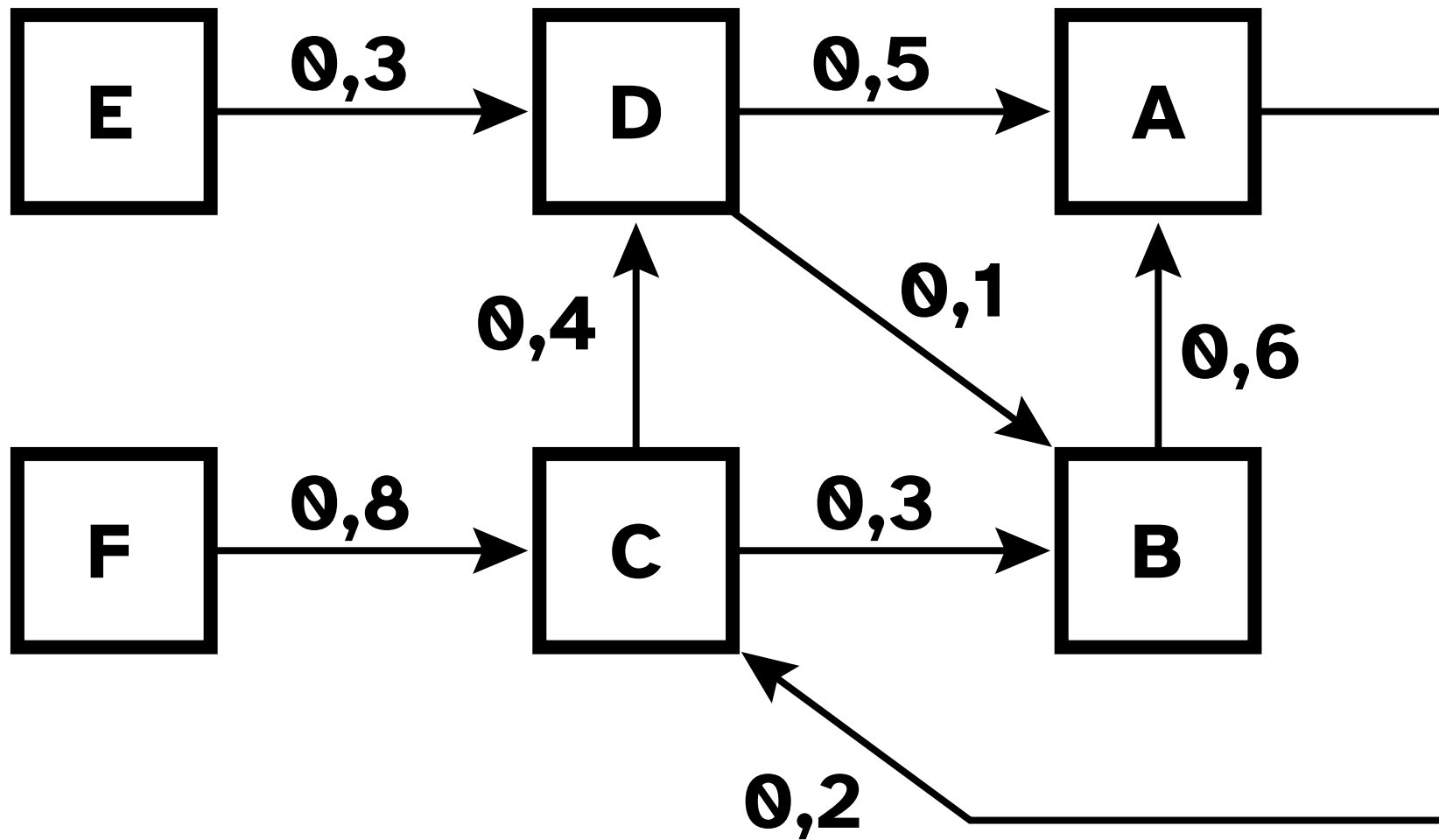
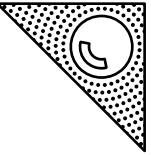
**Kleider-
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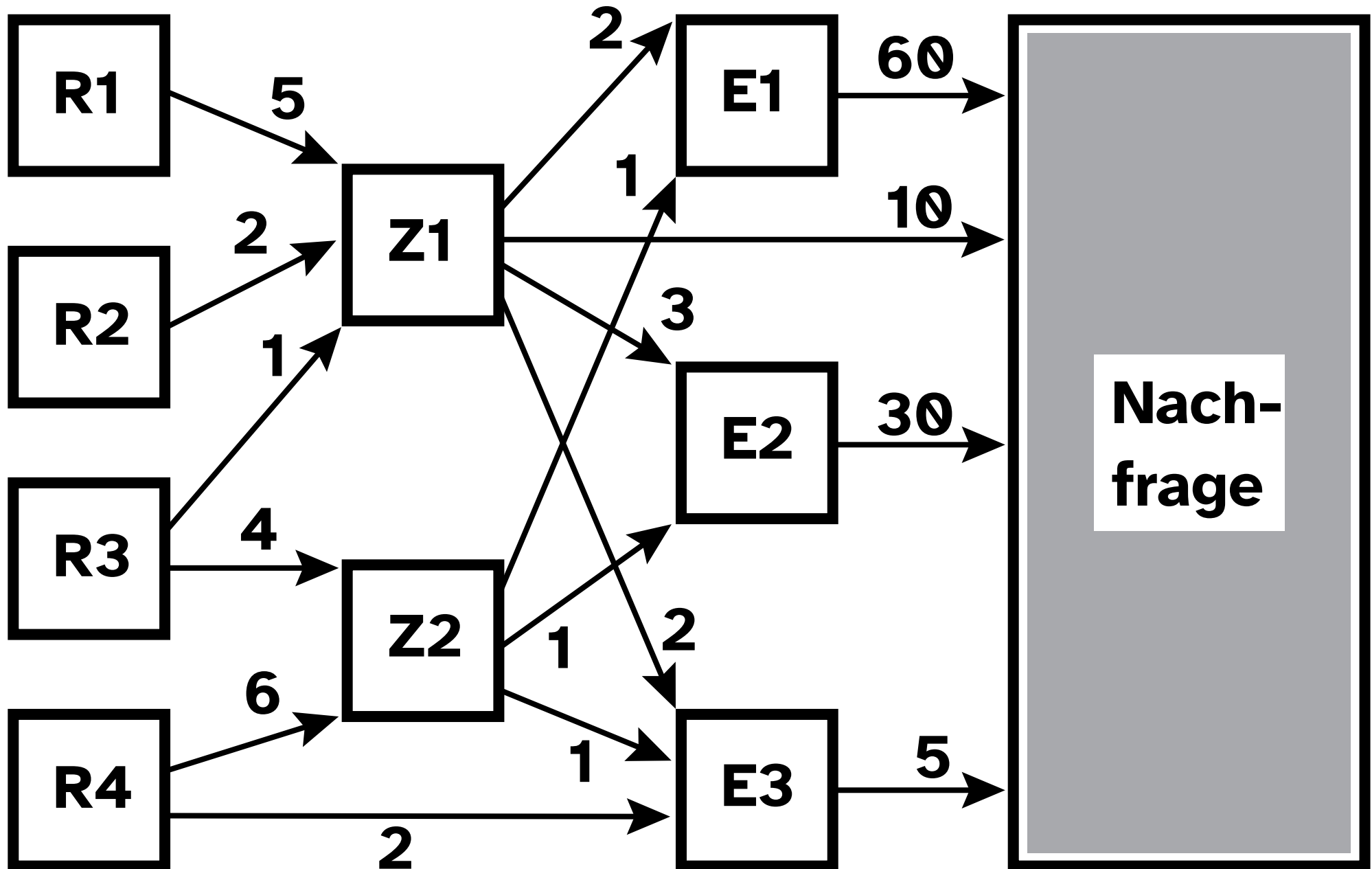
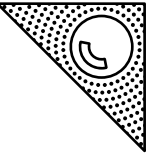


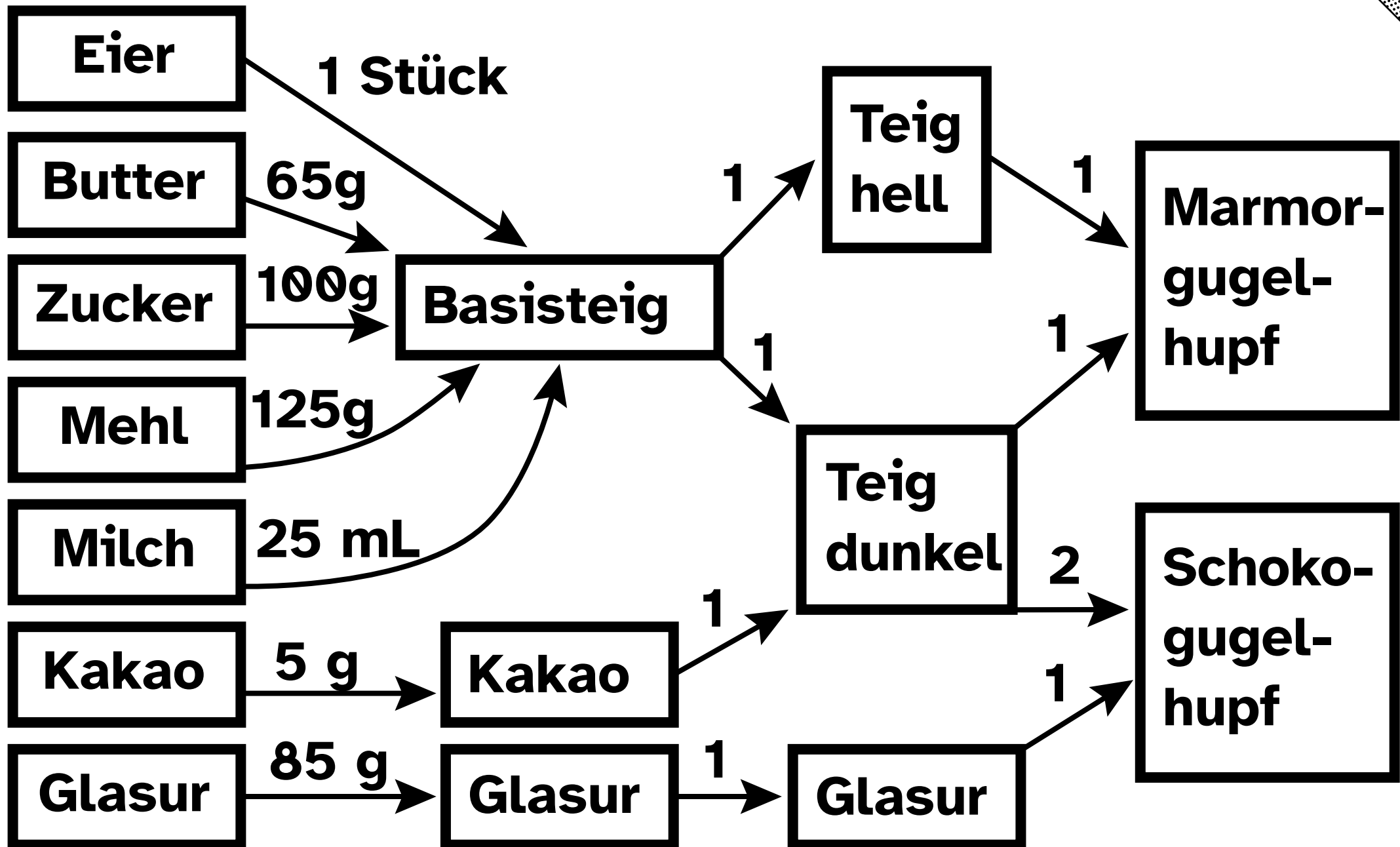
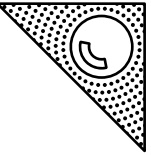


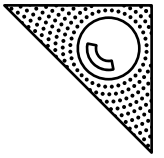










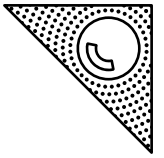


Angewandte Mathematik

HAK Band 2

5.

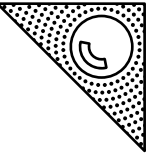
Trigonometrie



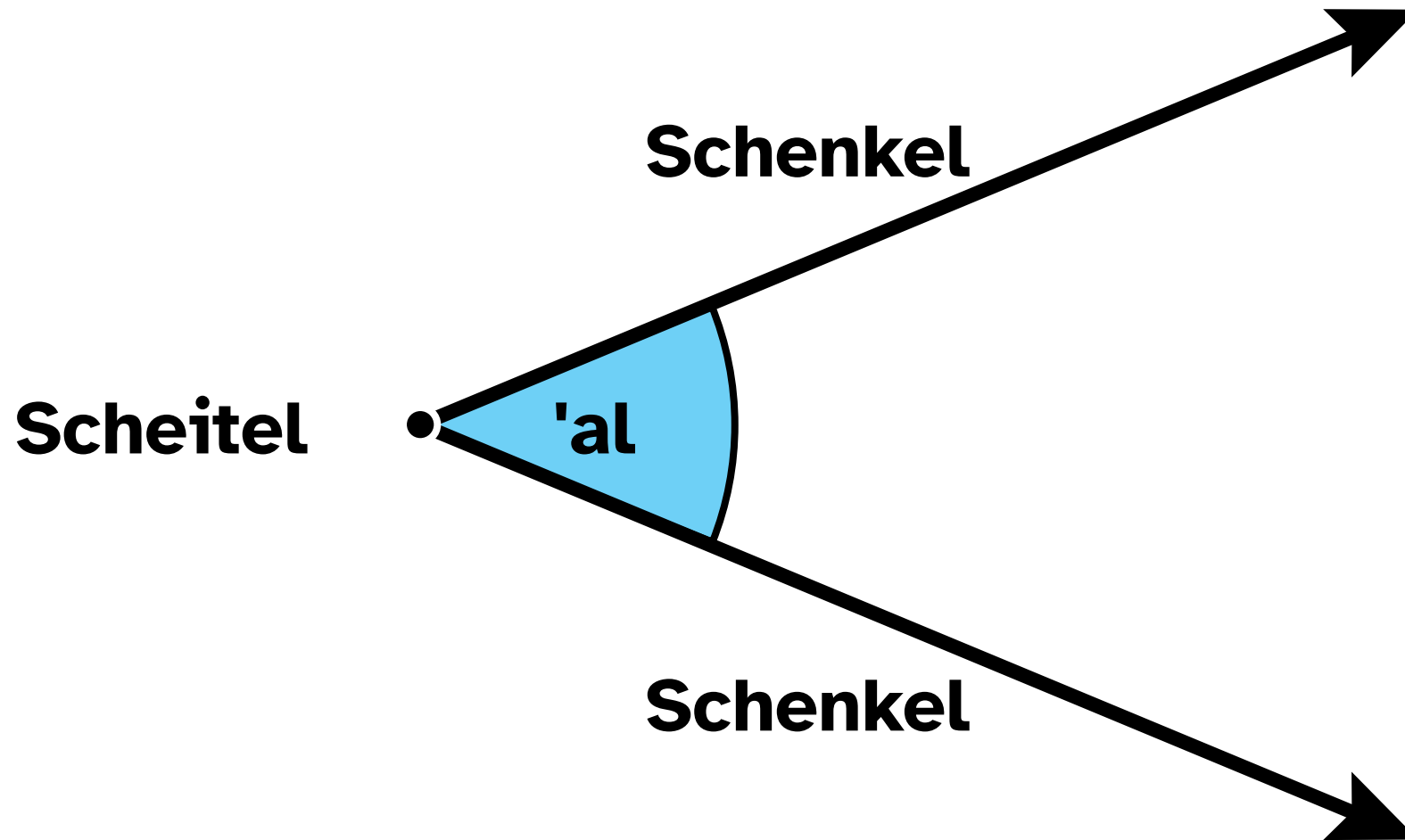
Angewandte Mathematik HAK Band 2

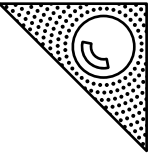
5. Trigonometrie

Teil 1, Seiten 106 - 119



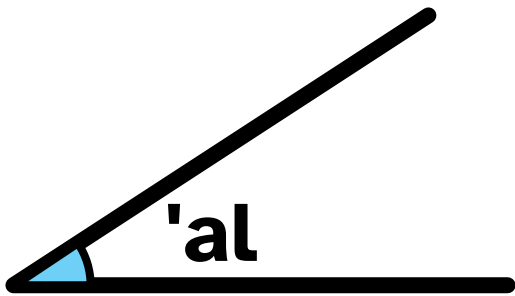
Winkel - Definition





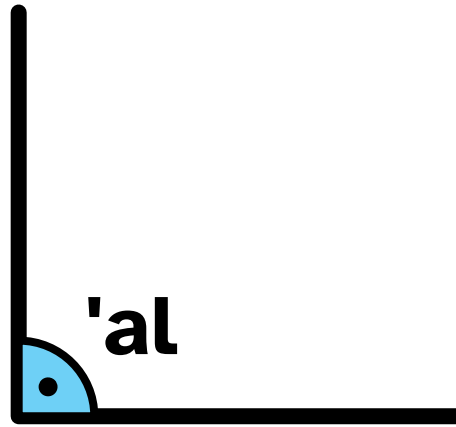
Einteilung der Winkel nach ihrer Größe 1/2

**spitzer
Winkel**



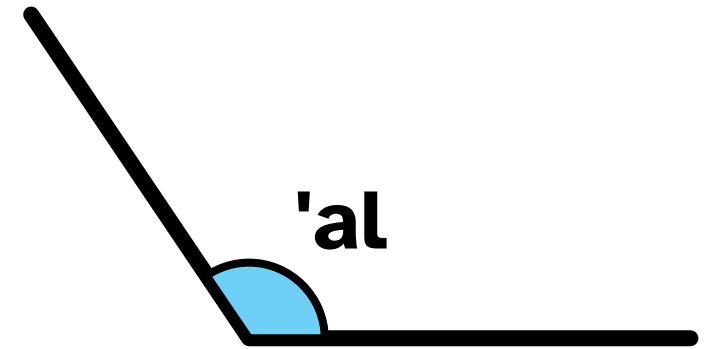
$$0^\circ < 'a < 90^\circ$$

**rechter
Winkel**

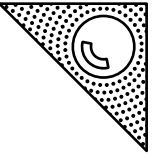


$$'a = 90^\circ$$

**stumpfer
Winkel**

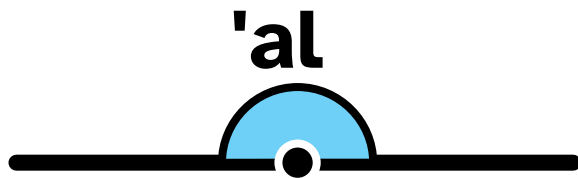


$$90^\circ < 'a < 180^\circ$$



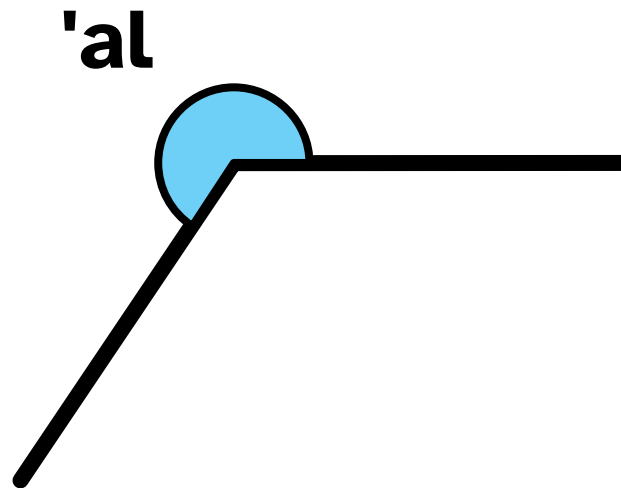
Einteilung der Winkel nach ihrer Größe 2/2

**gestreckter
Winkel**



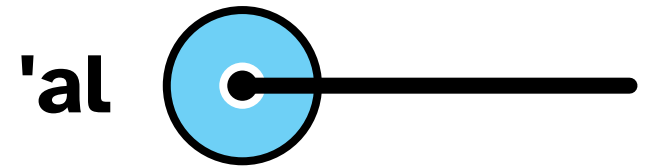
$$'al = 180^\circ$$

**erhabener
Winkel**

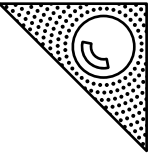


$$180^\circ < 'al < 360^\circ$$

**voller
Winkel**

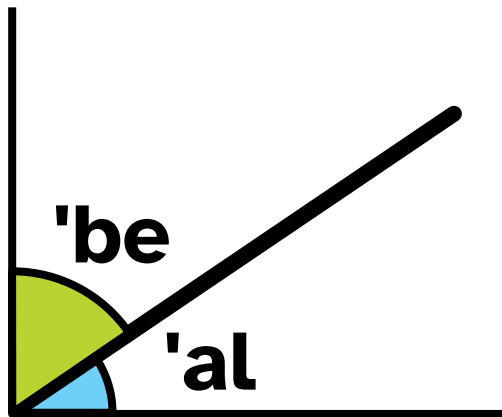


$$'al = 360^\circ$$



Winkelpaare in besonderer Lage

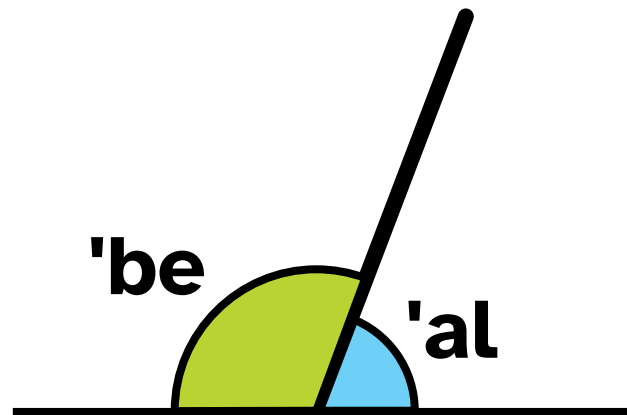
Komplementärwinkel



$$'al + 'be = 90^\circ$$

ergänzen einander auf 90°

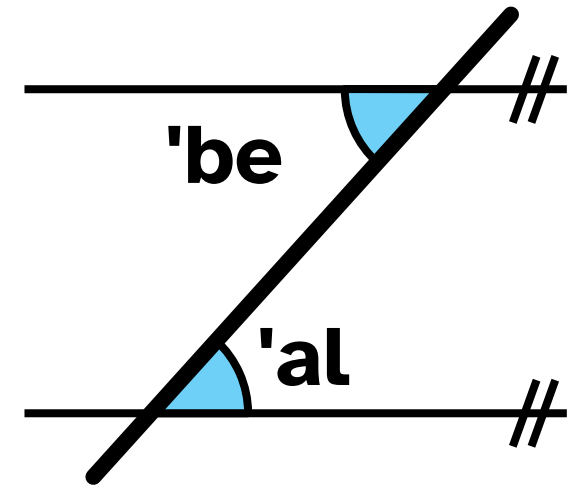
Supplementärwinkel



$$'al + 'be = 180^\circ$$

ergänzen einander auf 180°

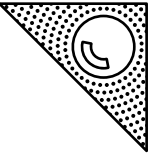
Wechselwinkel



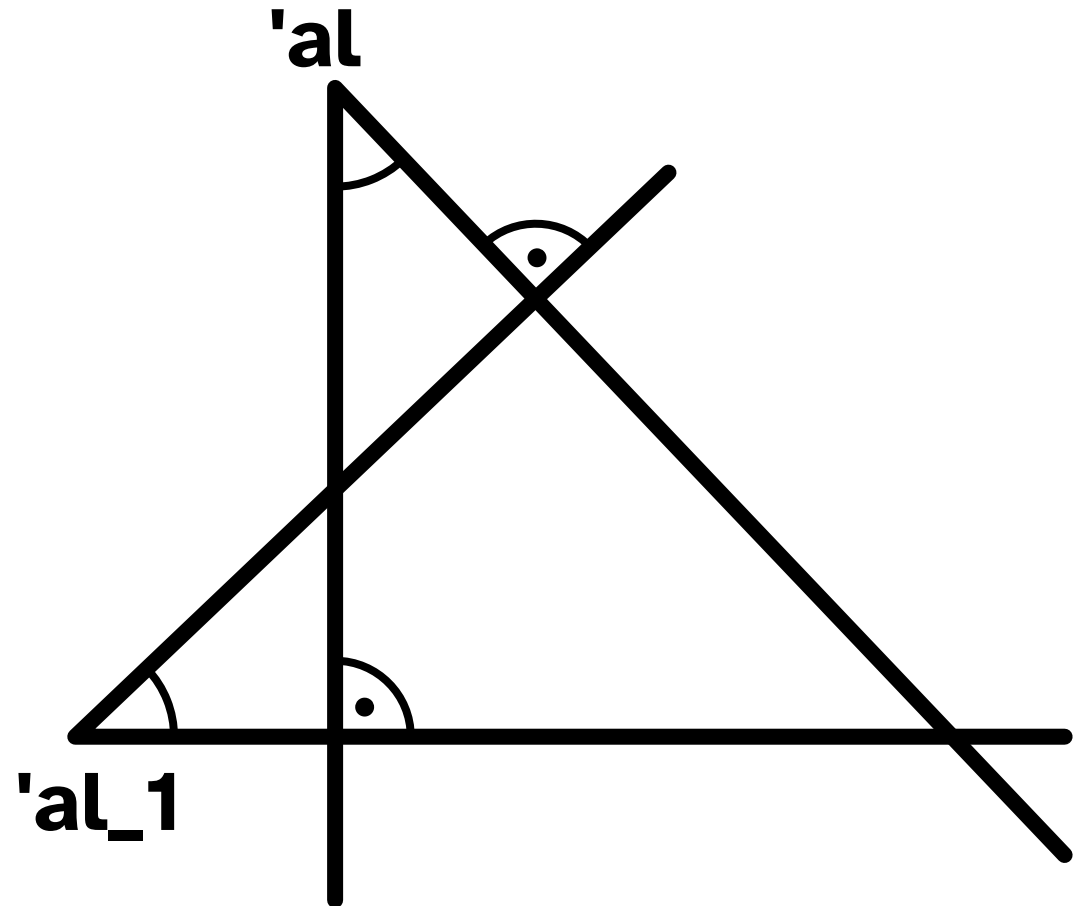
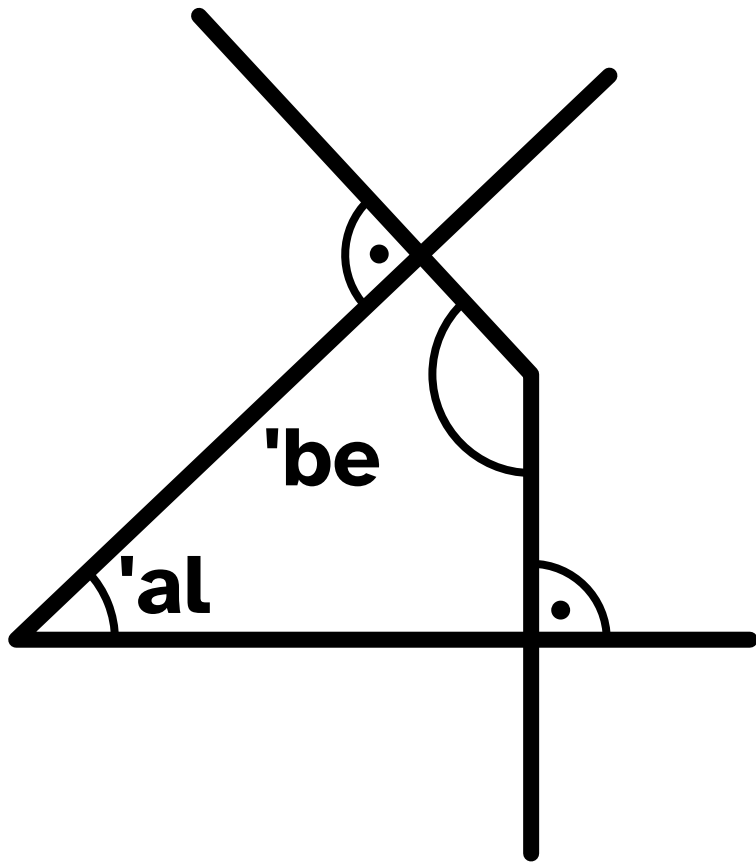
$$'al = 'be$$

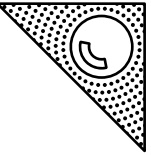
entspr.

Winkel sind gleich groß

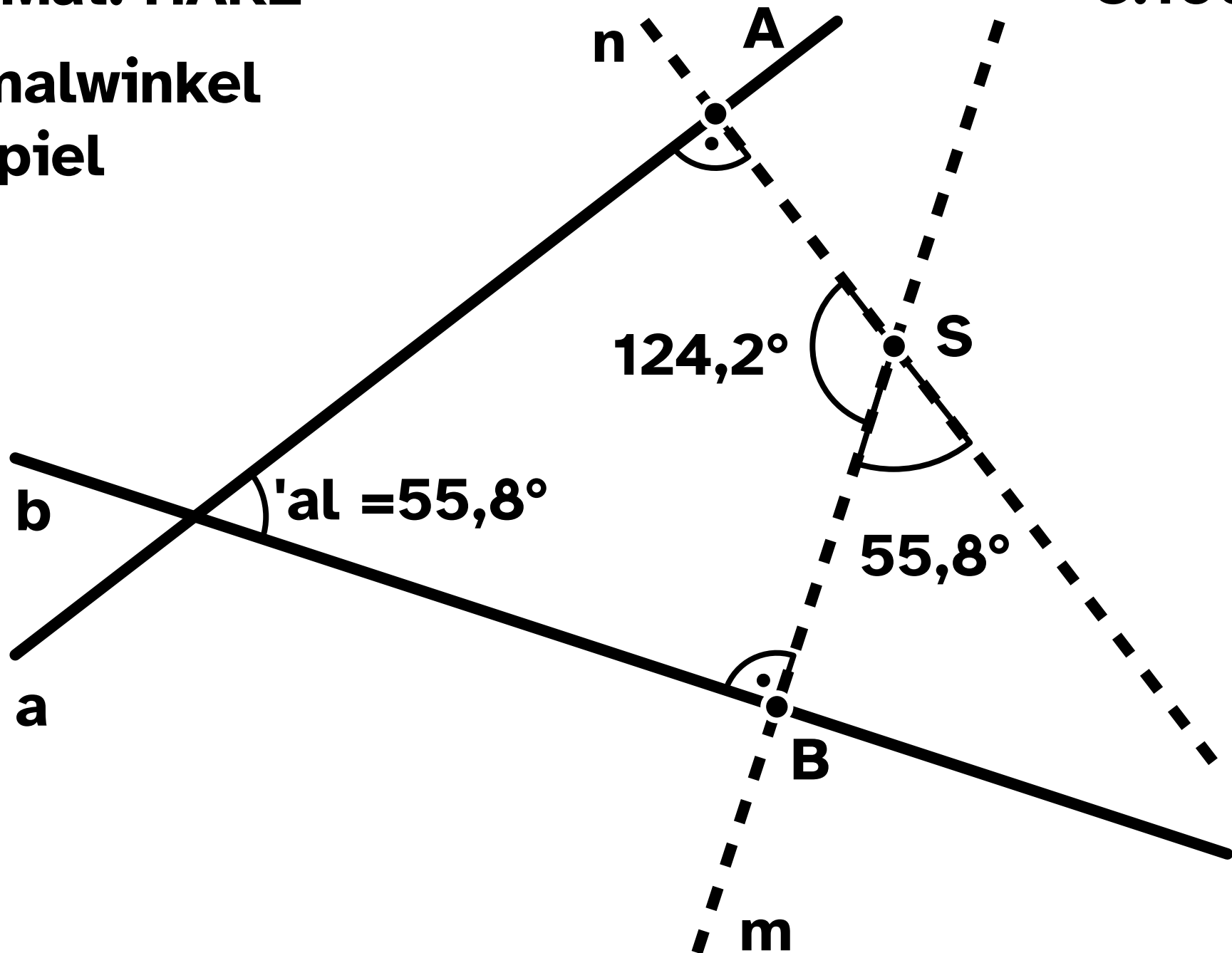


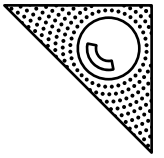
Normalwinkel



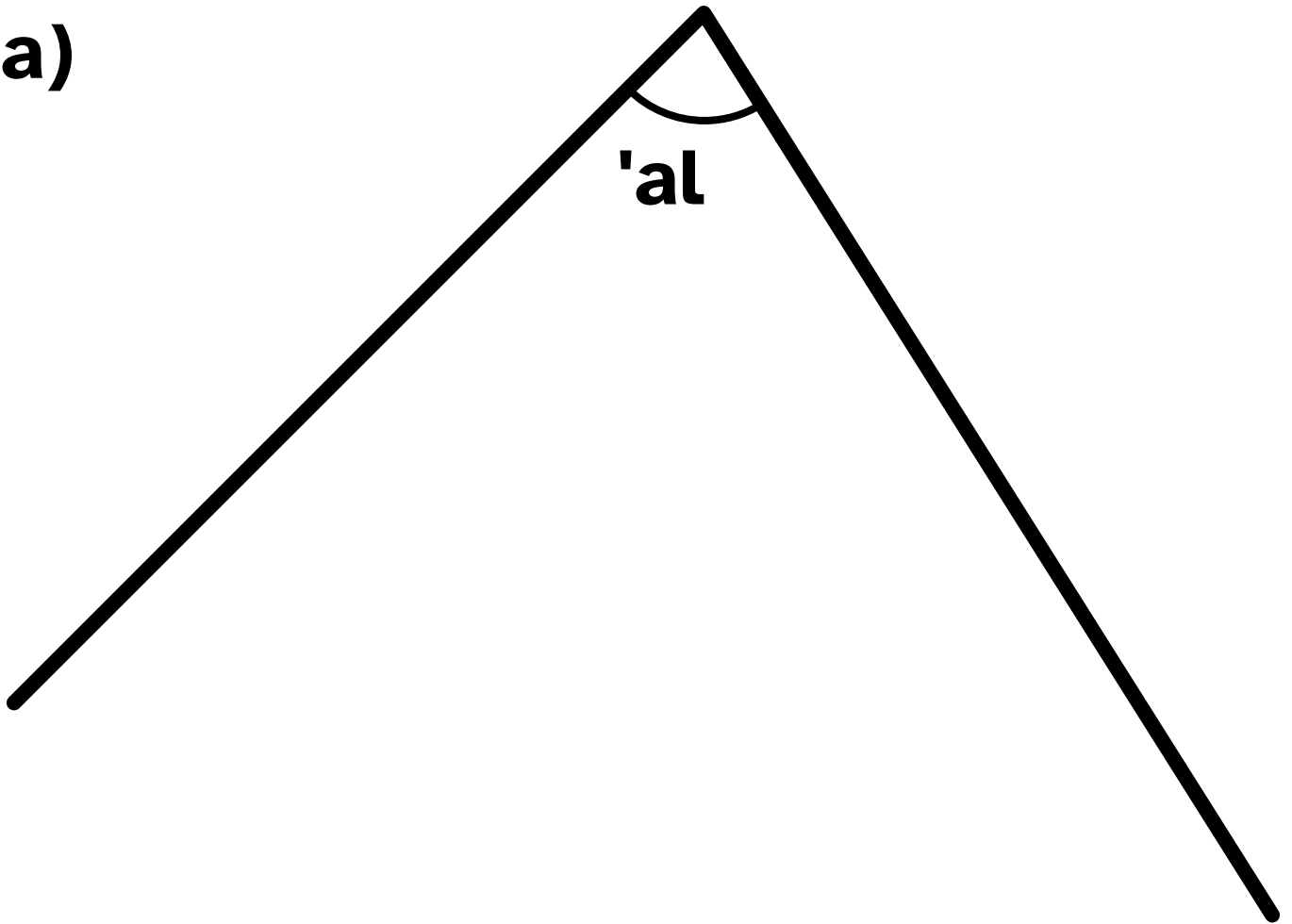


Normalwinkel
Beispiel

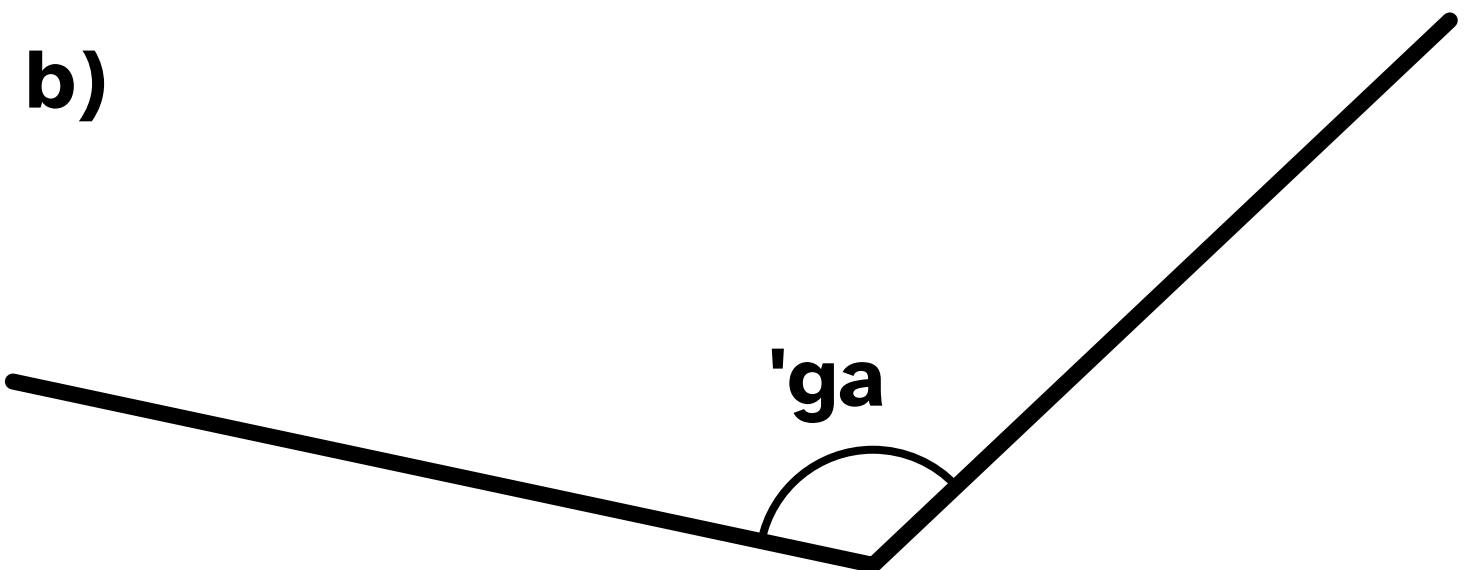


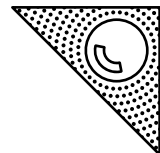


a)



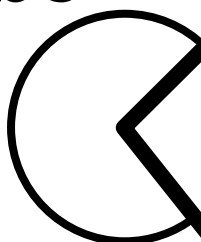
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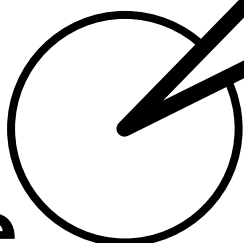
c)

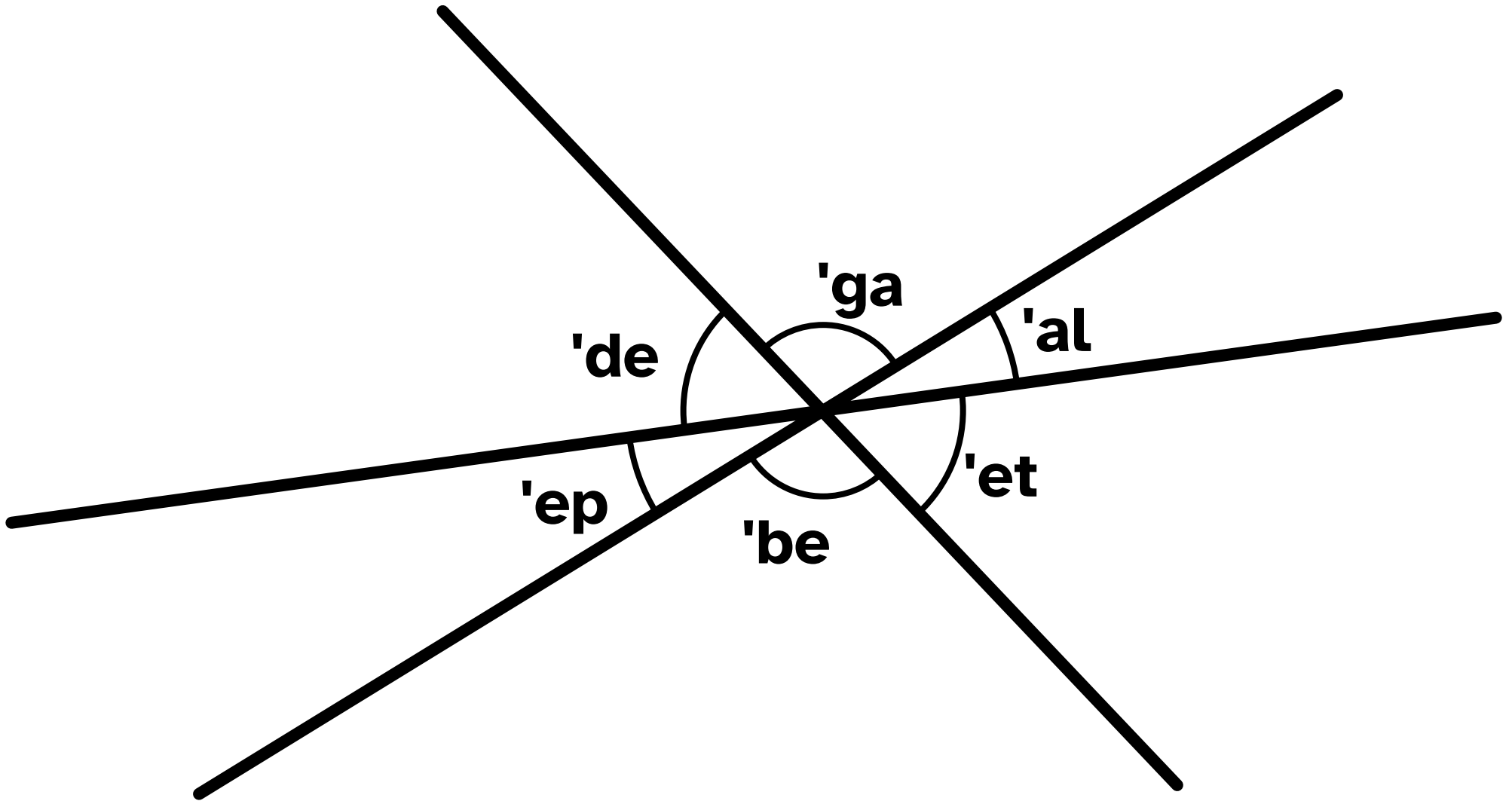
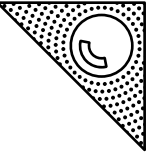
'be

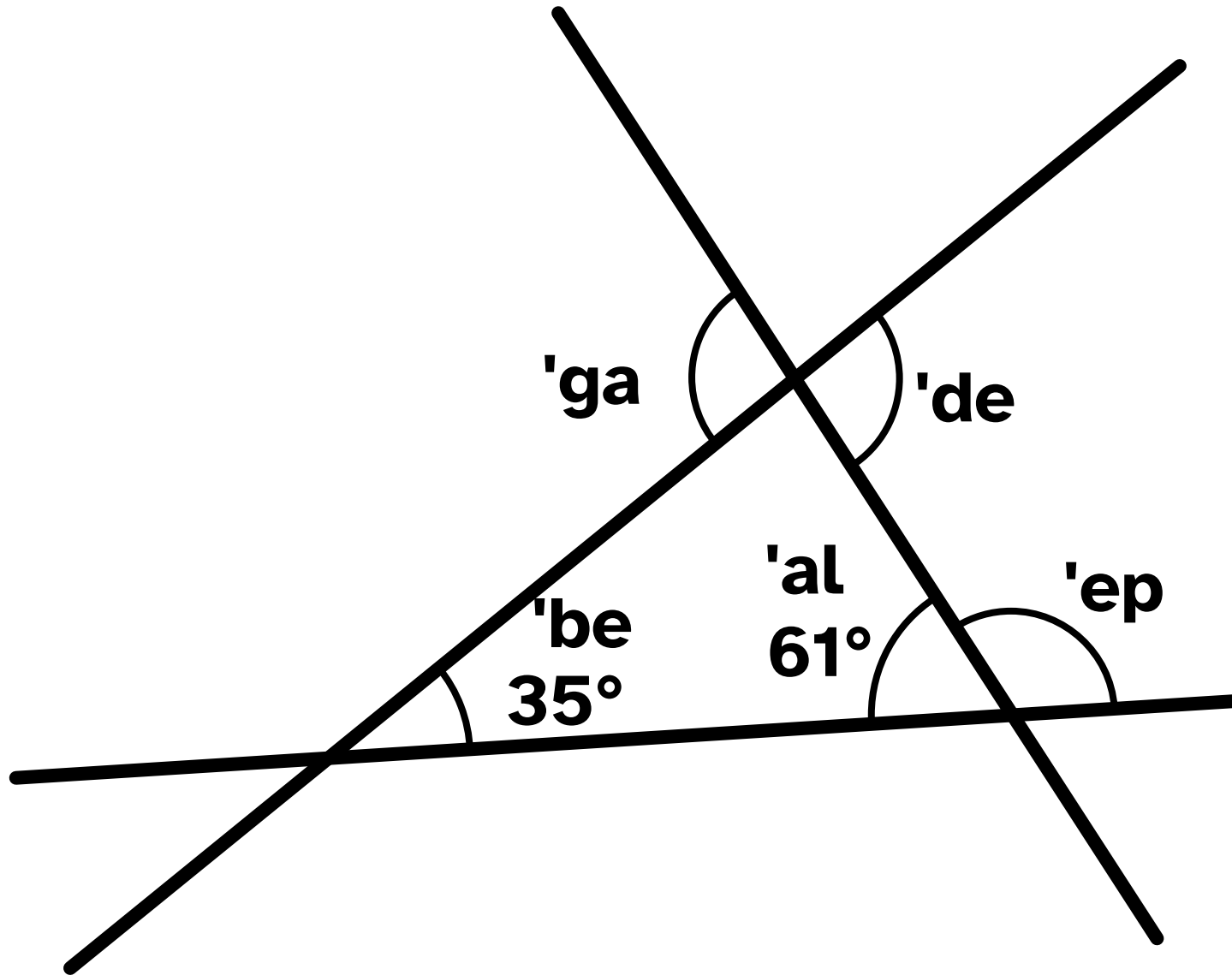
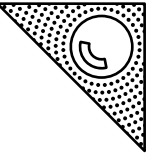


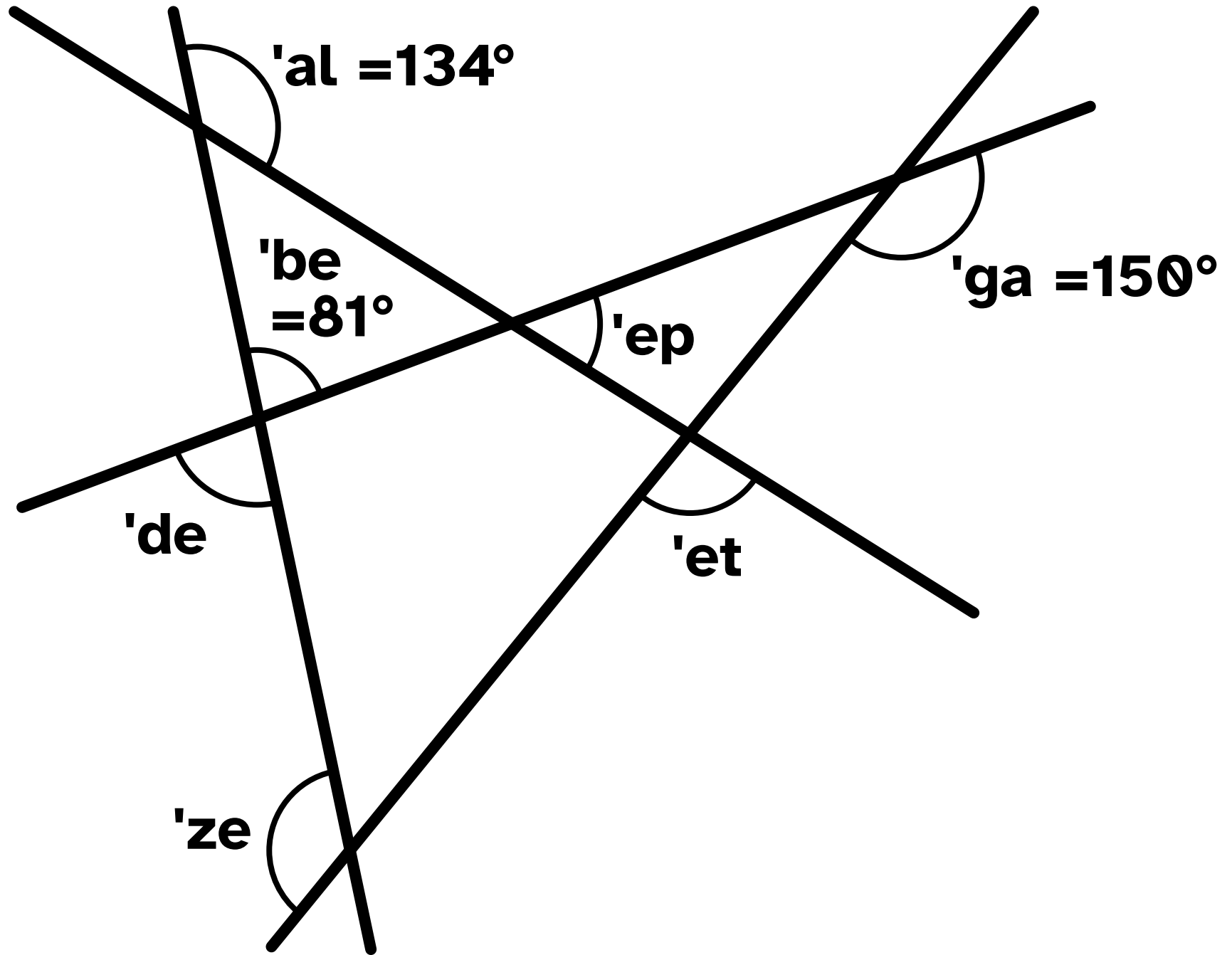
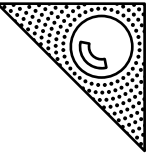
d)

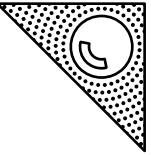
'de



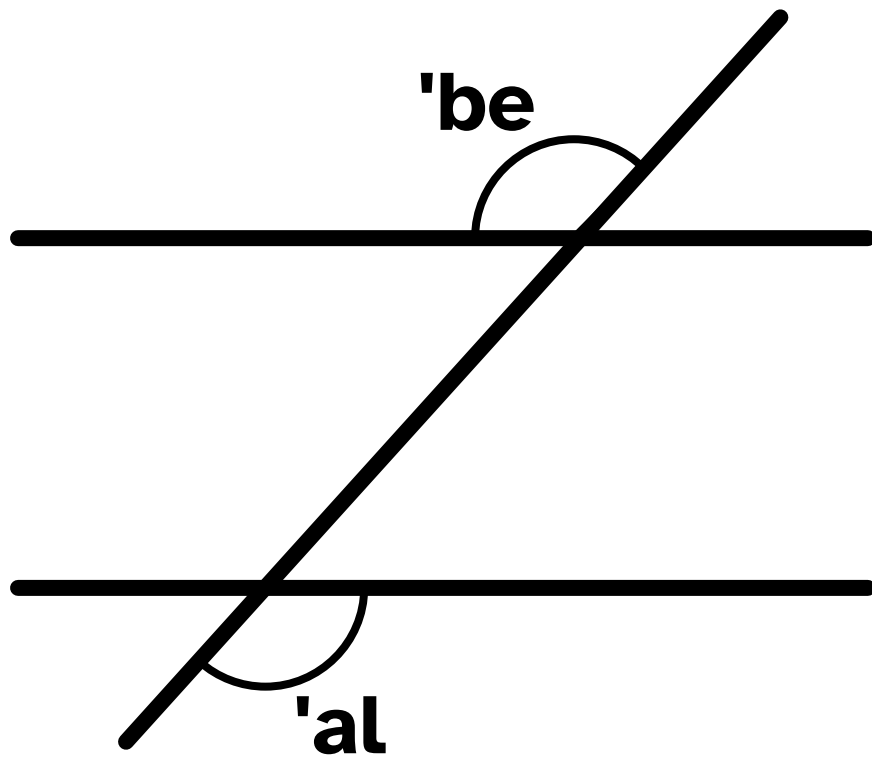




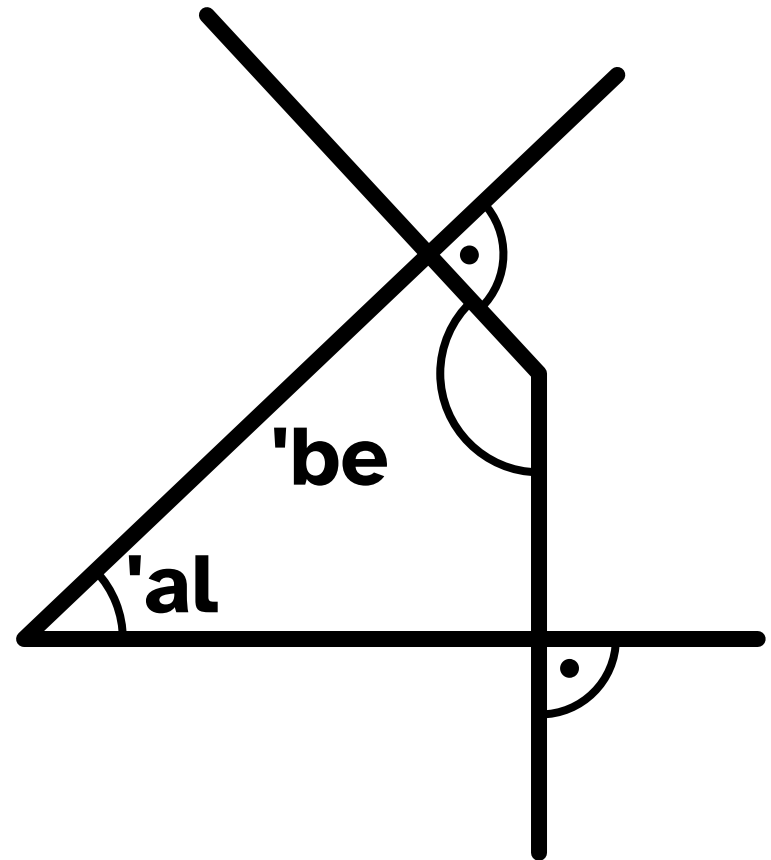


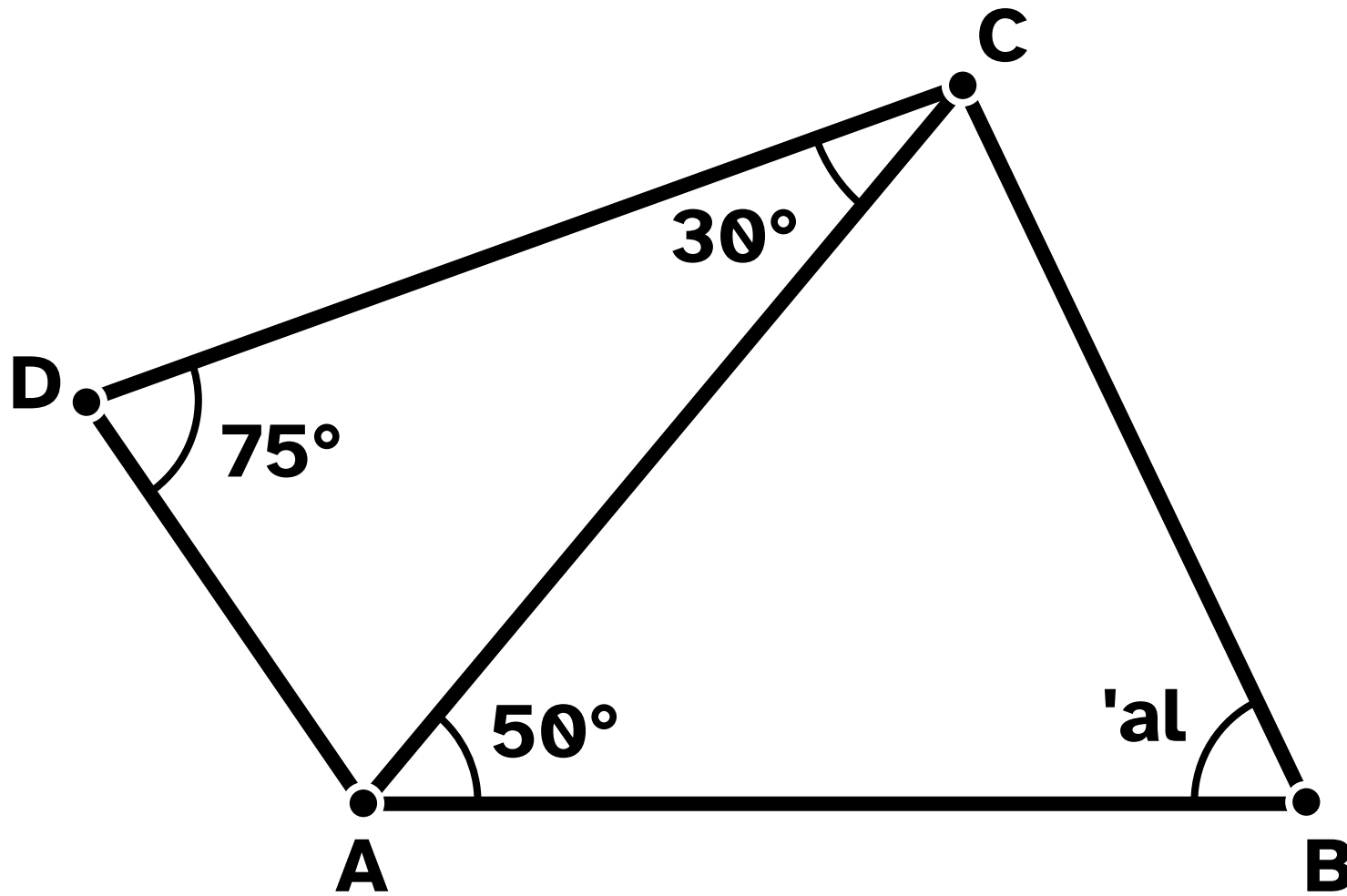
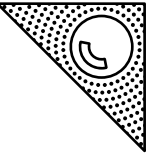


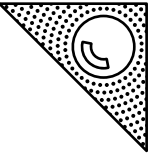
a)



b)

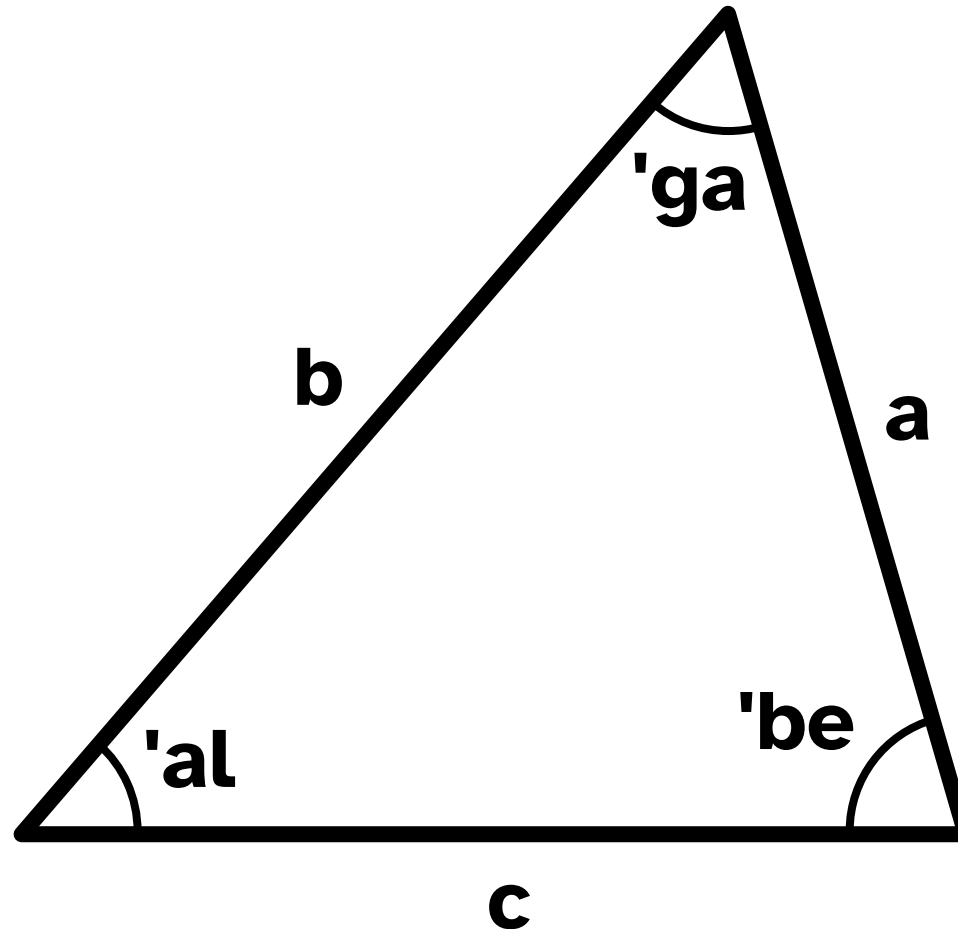


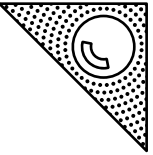




Einteilung der Dreiecke nach den Seiten

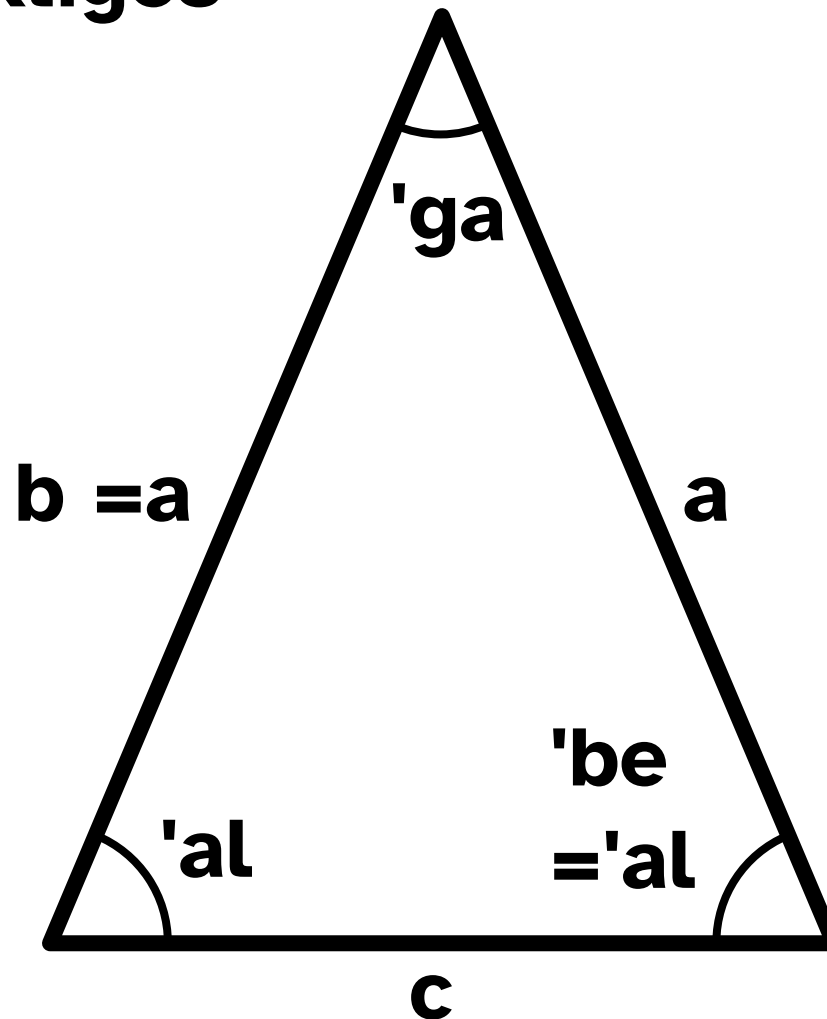
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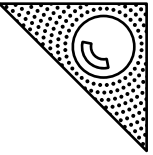




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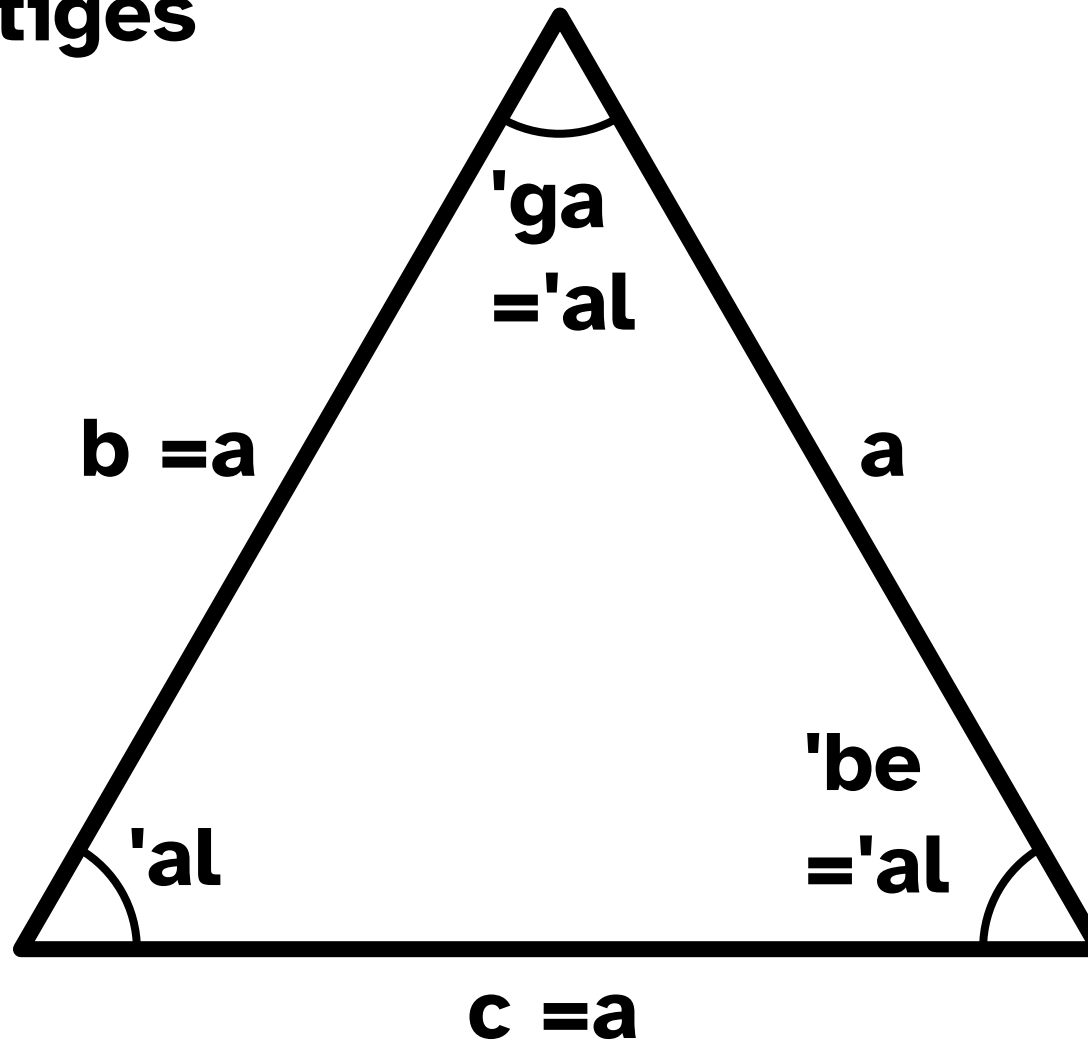
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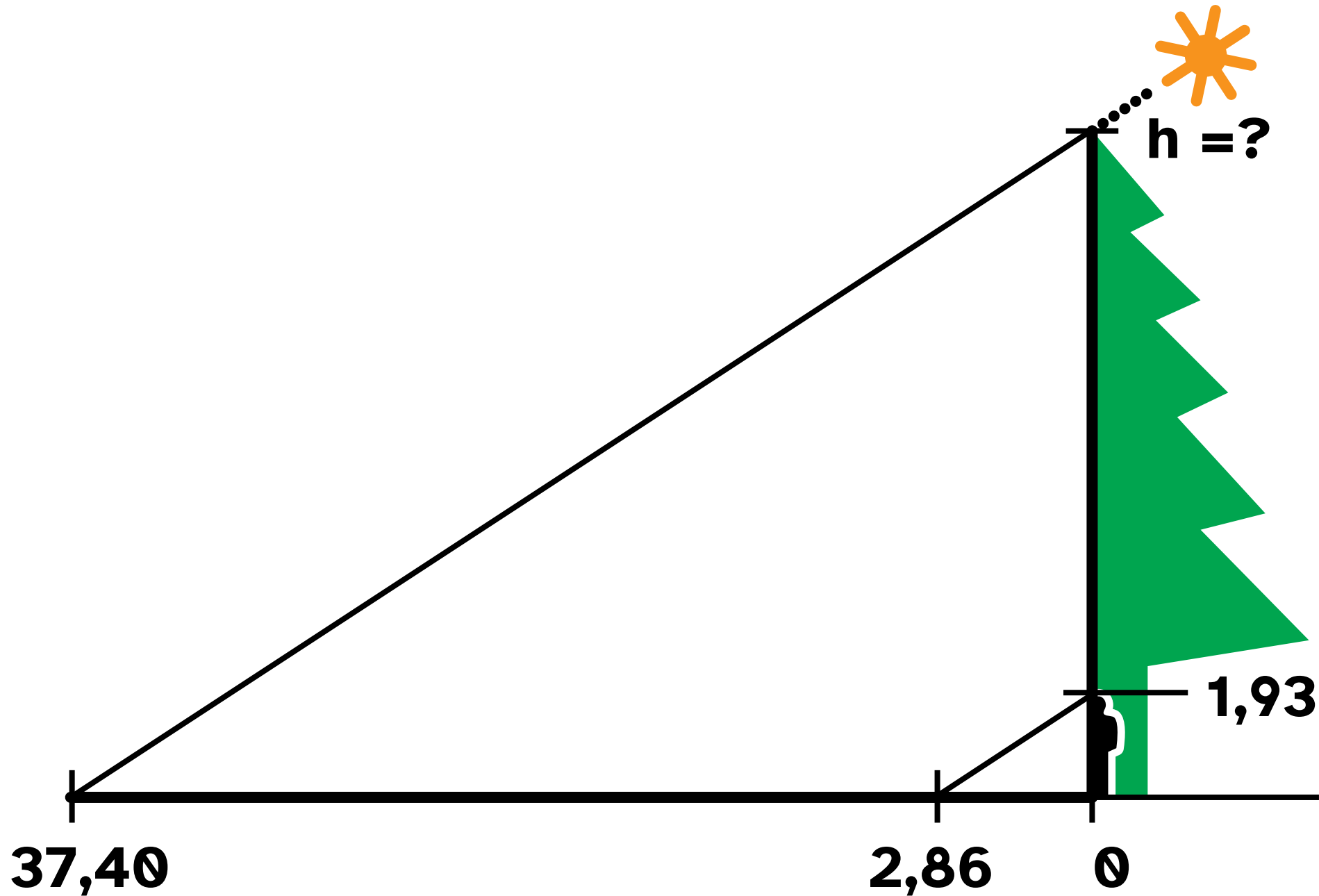
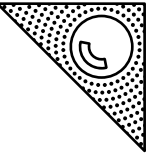


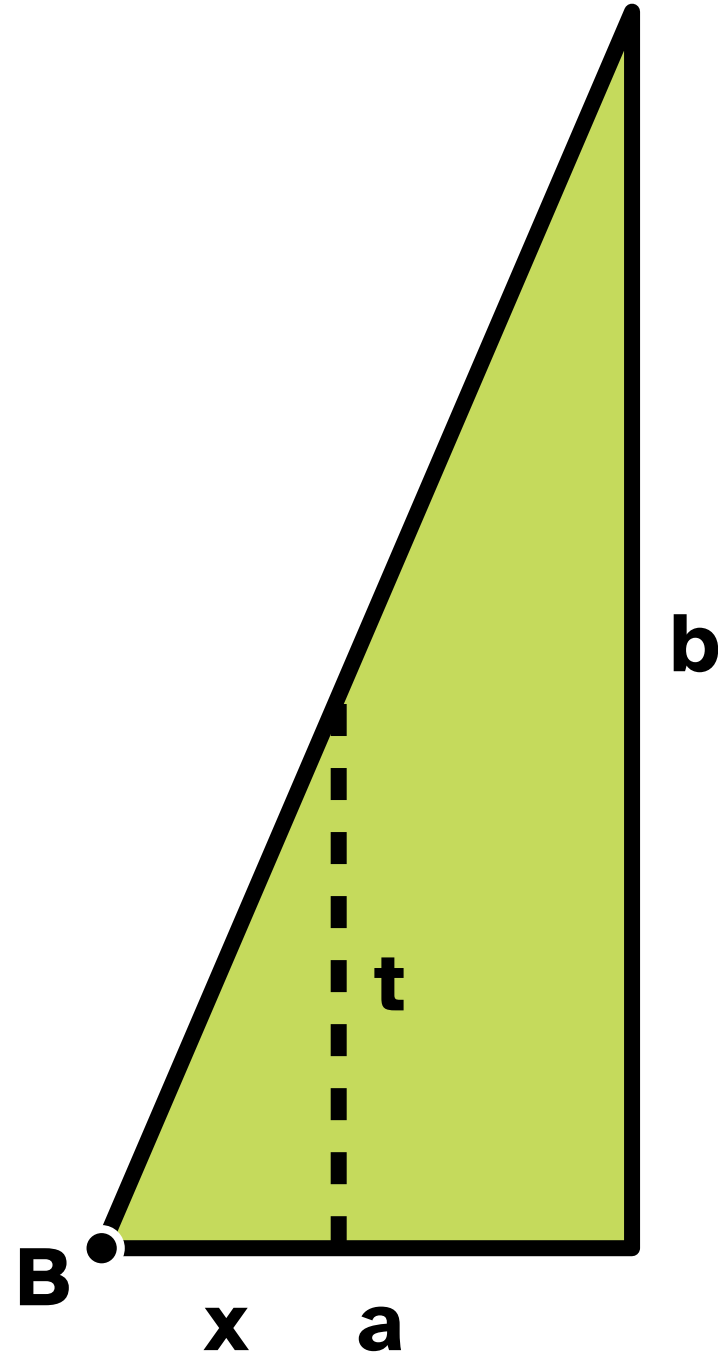
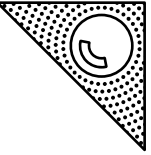


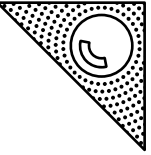
Einteilung der Dreiecke nach den Seiten

3) gleichseitiges Dreieck

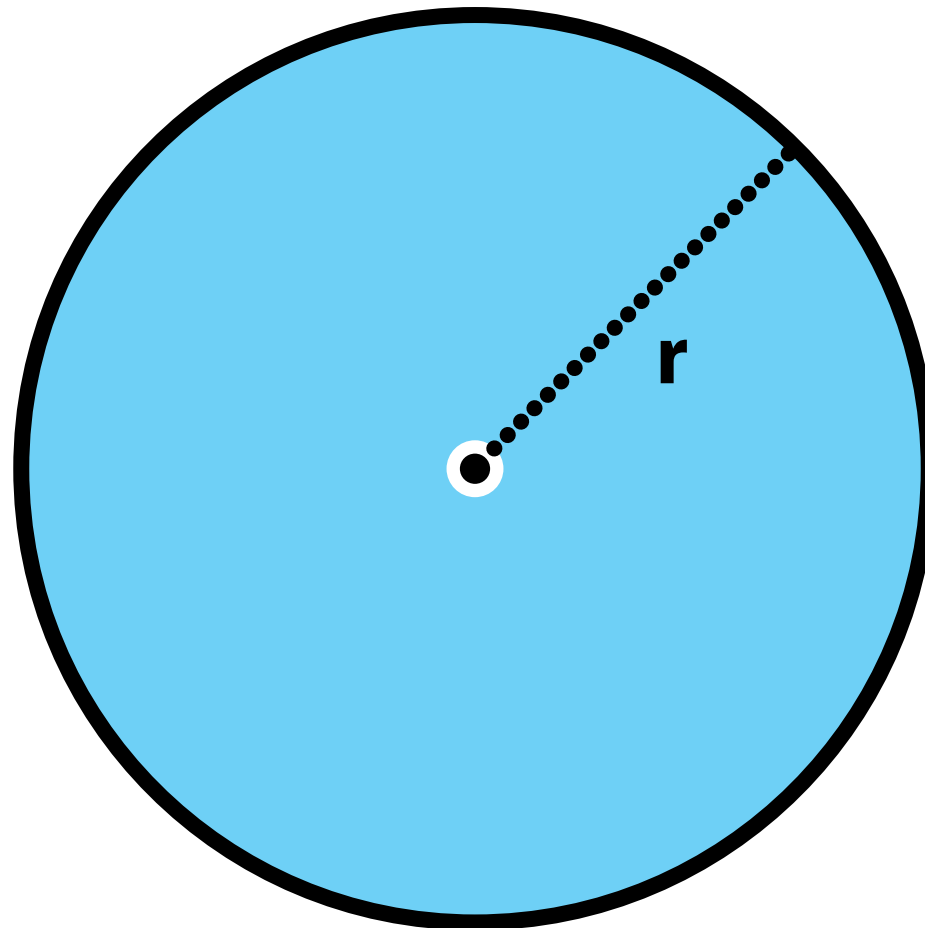


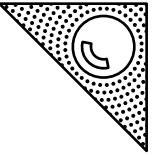




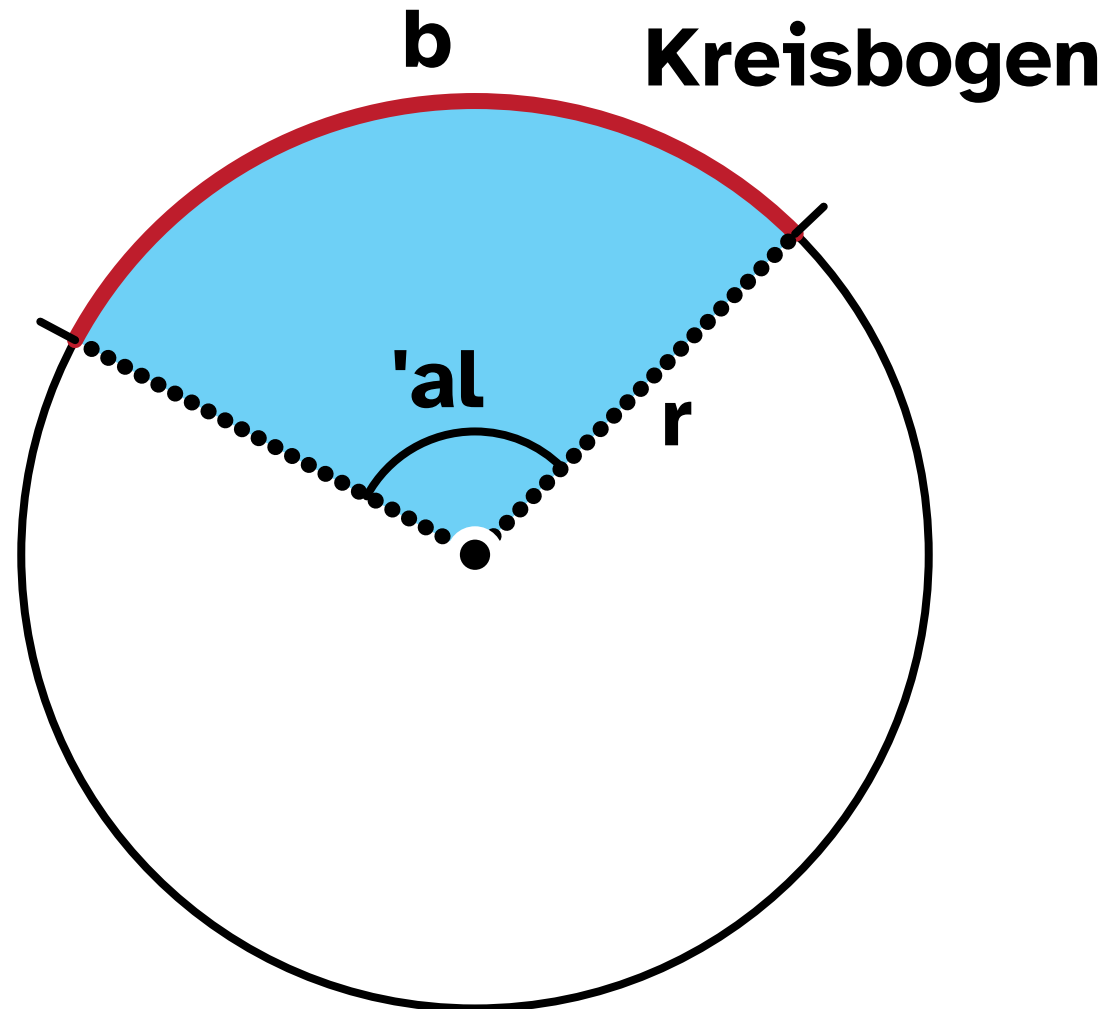


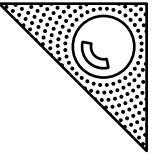
Kreis



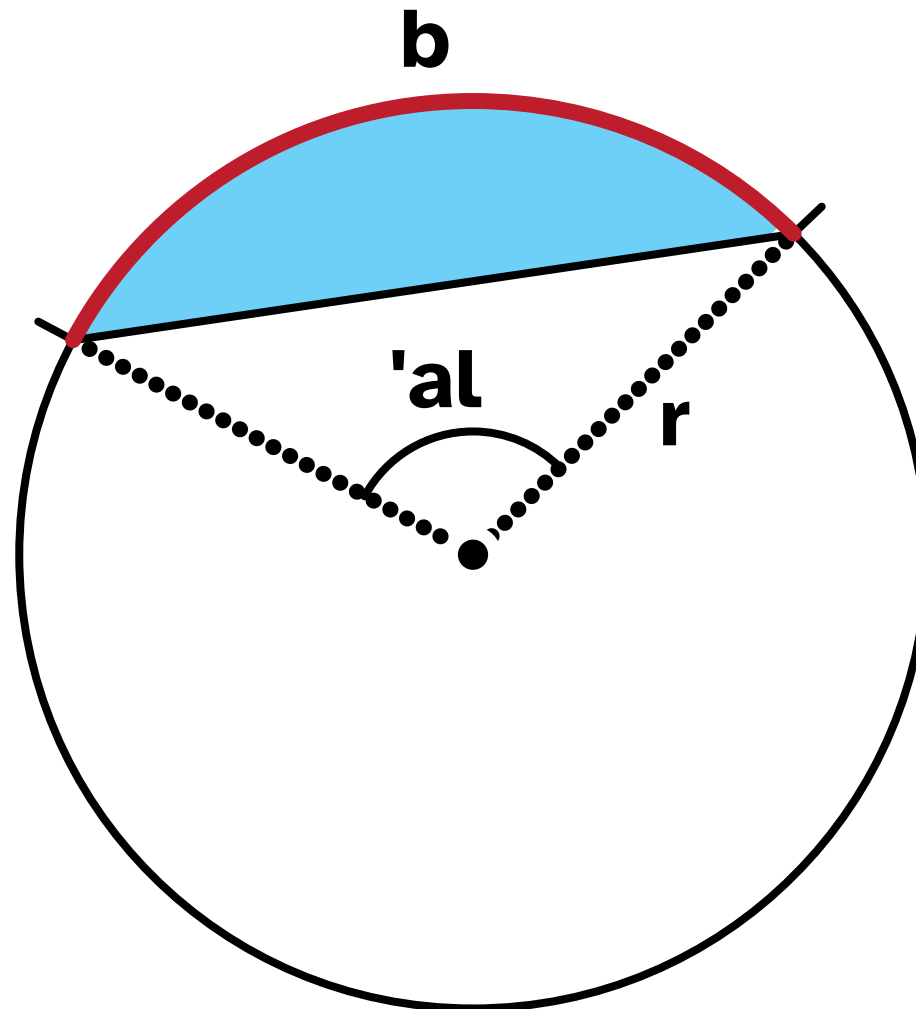


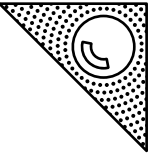
Kreissektor (Kreisausschnitt)



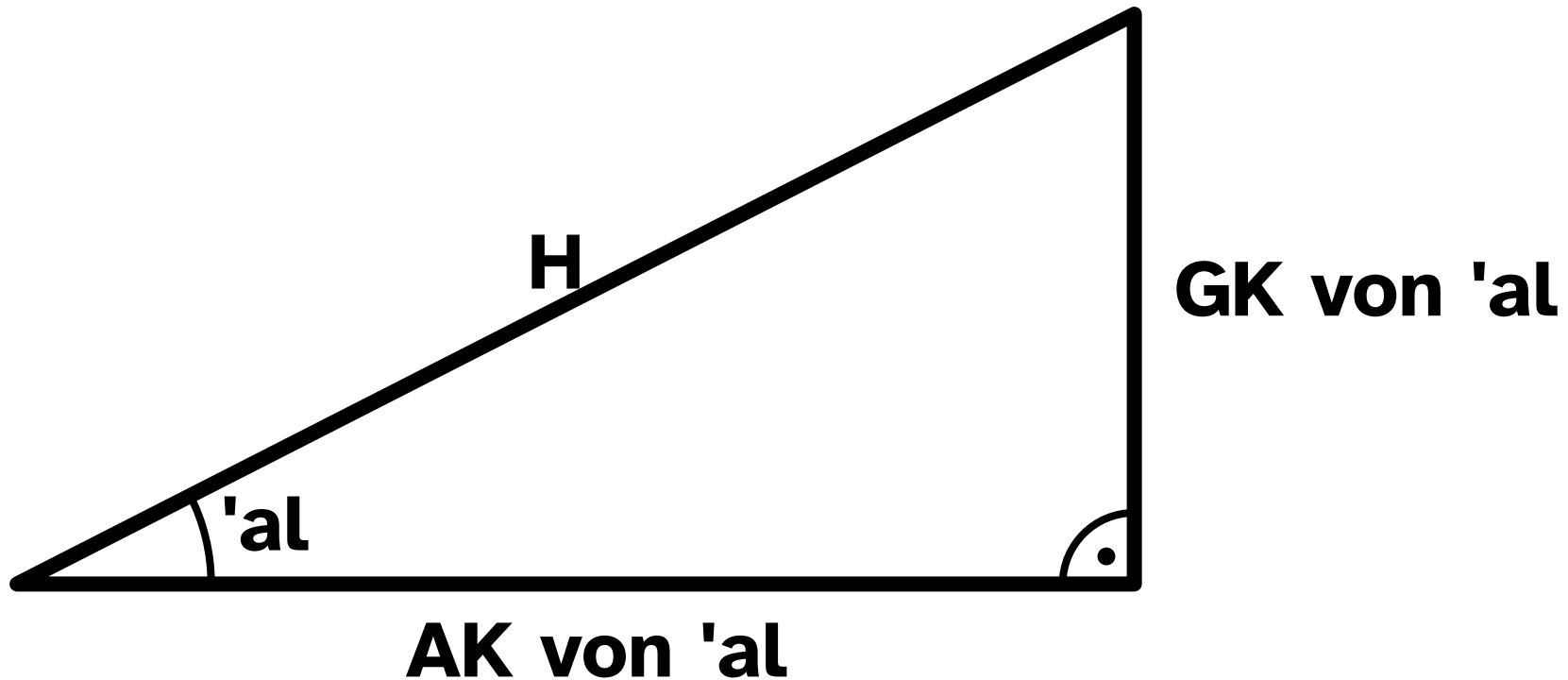


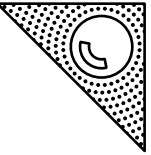
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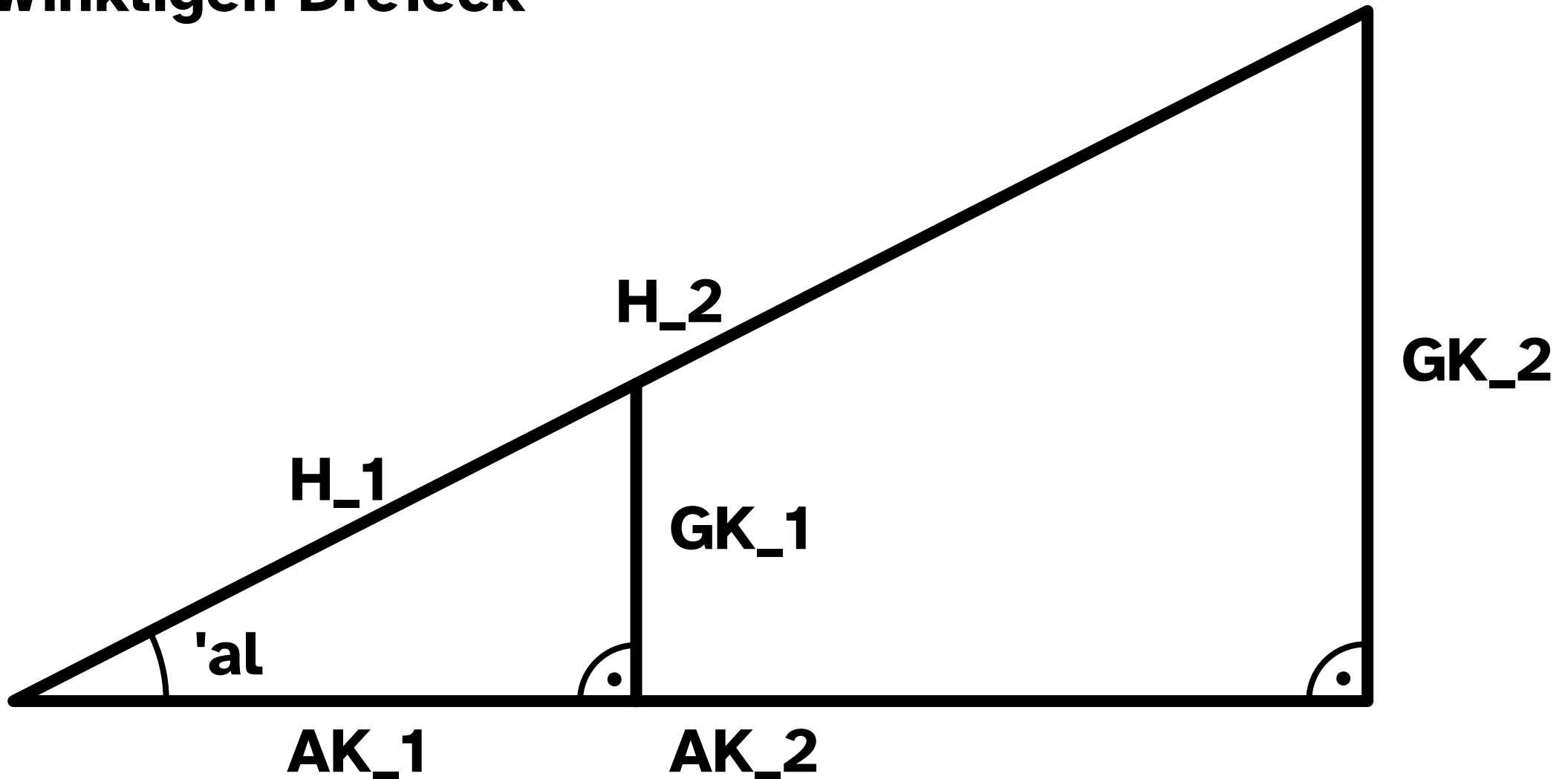


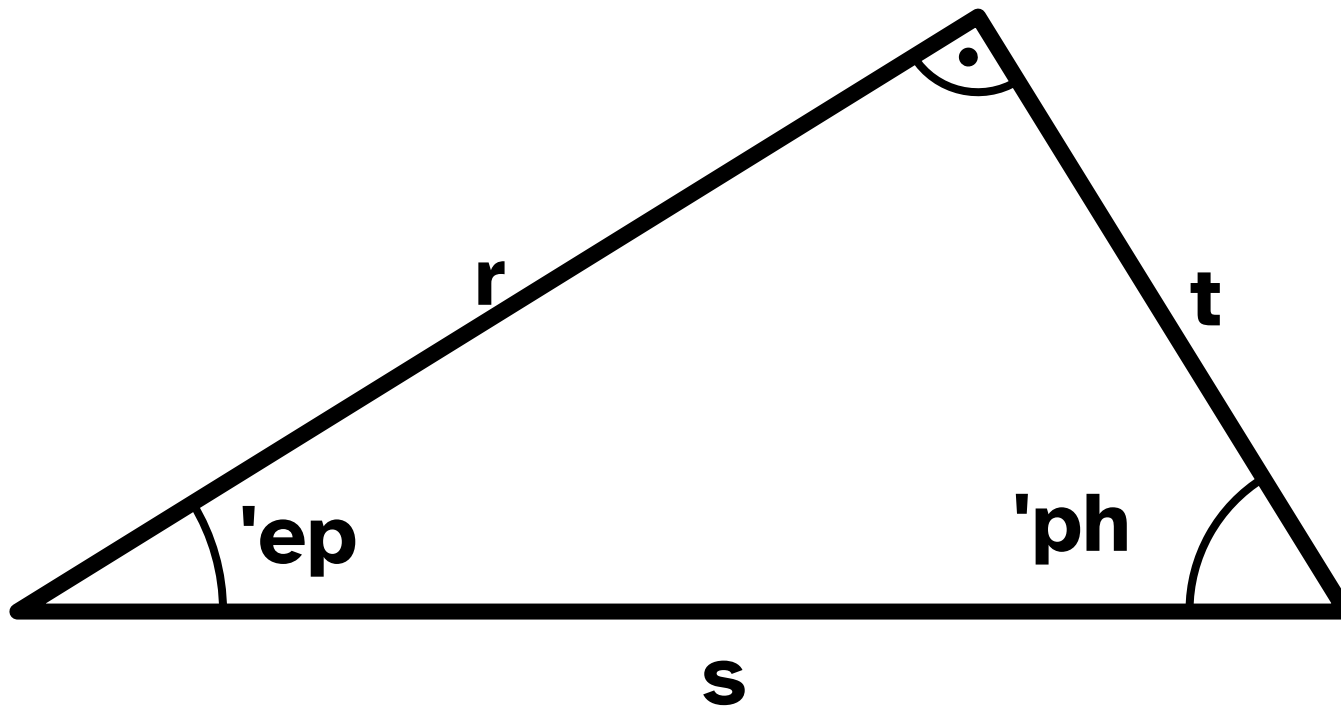
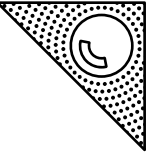
Bezeichnungen im rechtwinkligen Dreieck

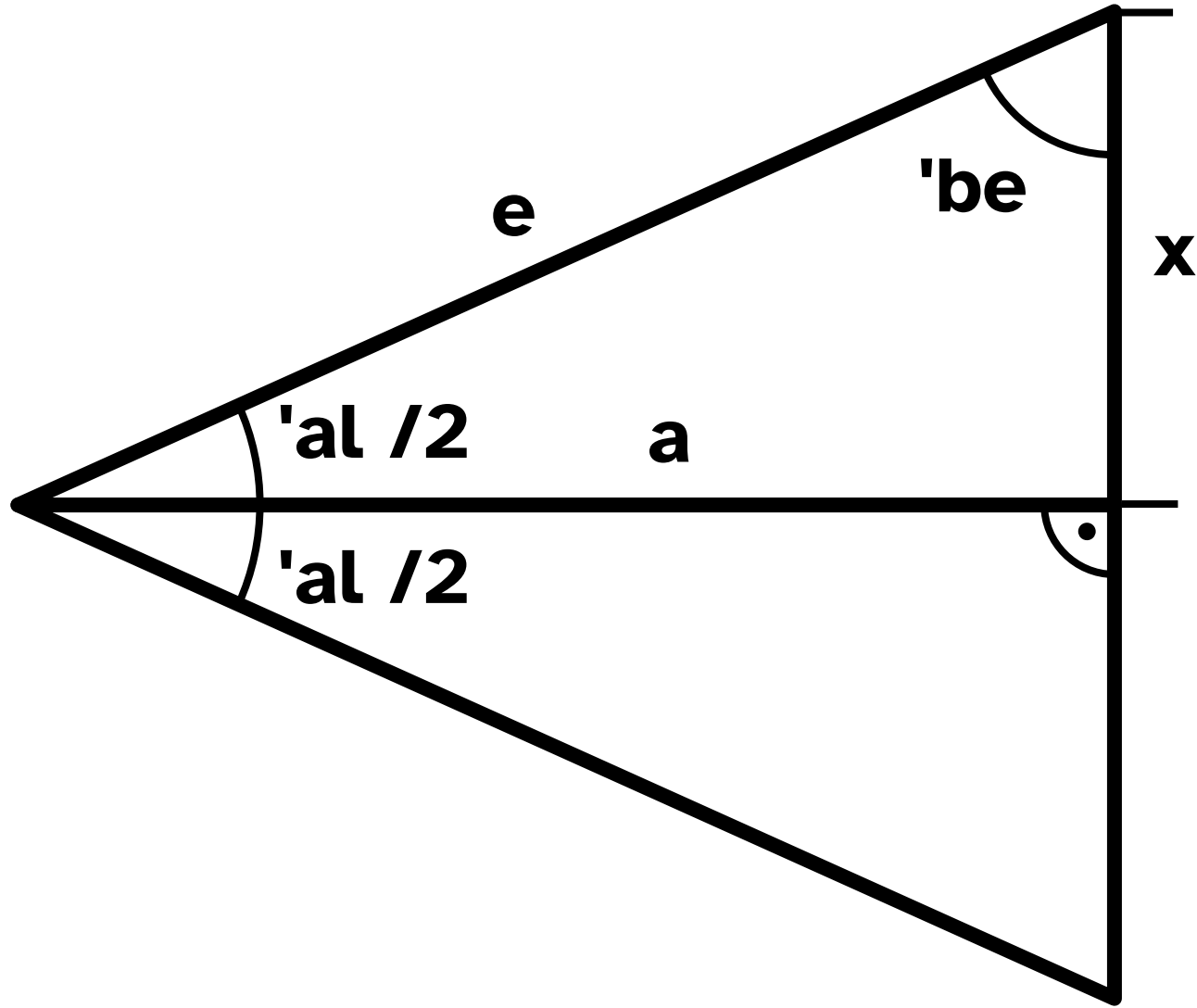
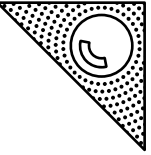


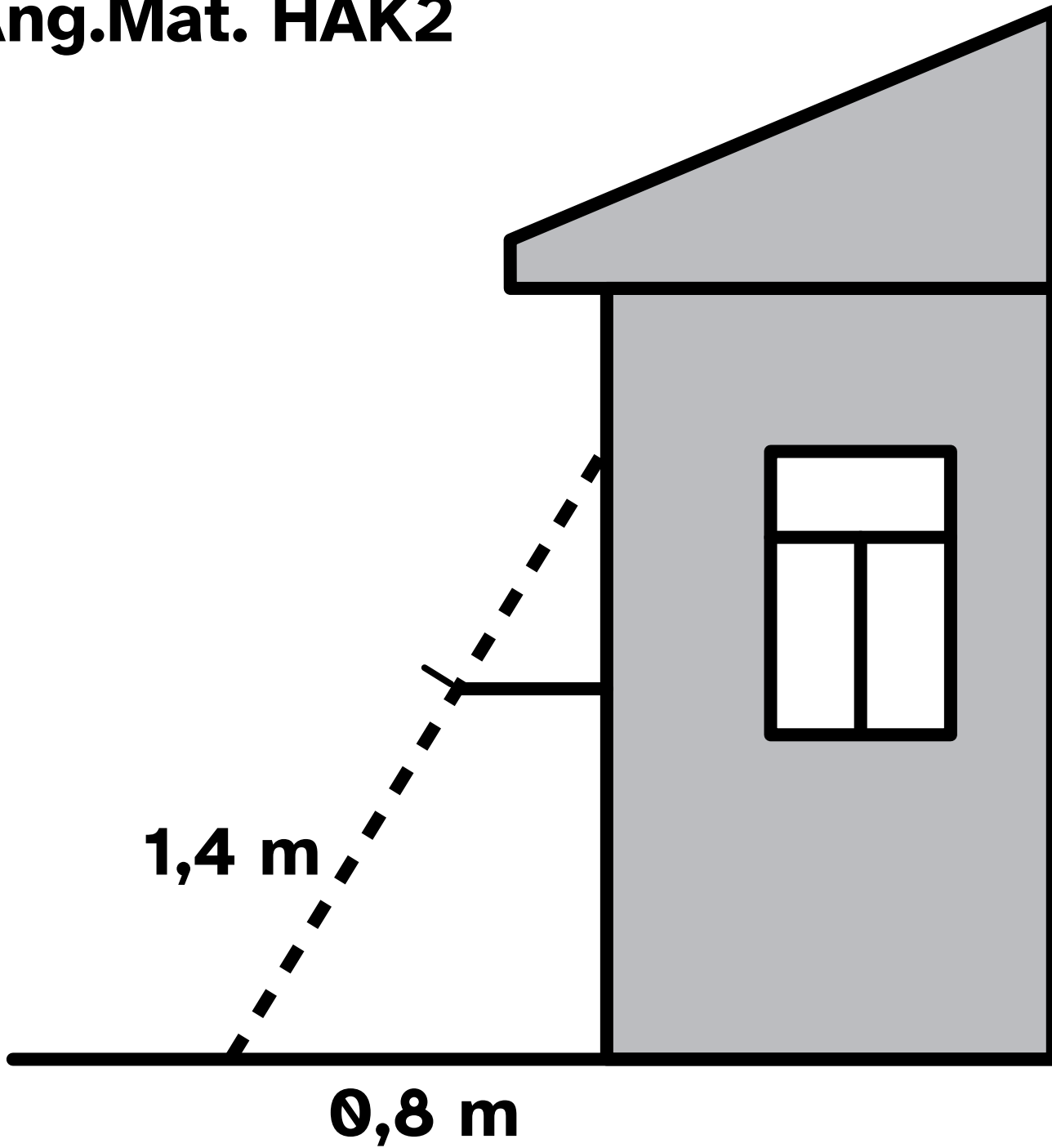
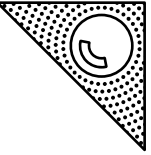


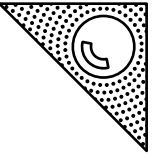
Seitenverhältnisse im rechtwinkligen Dreieck



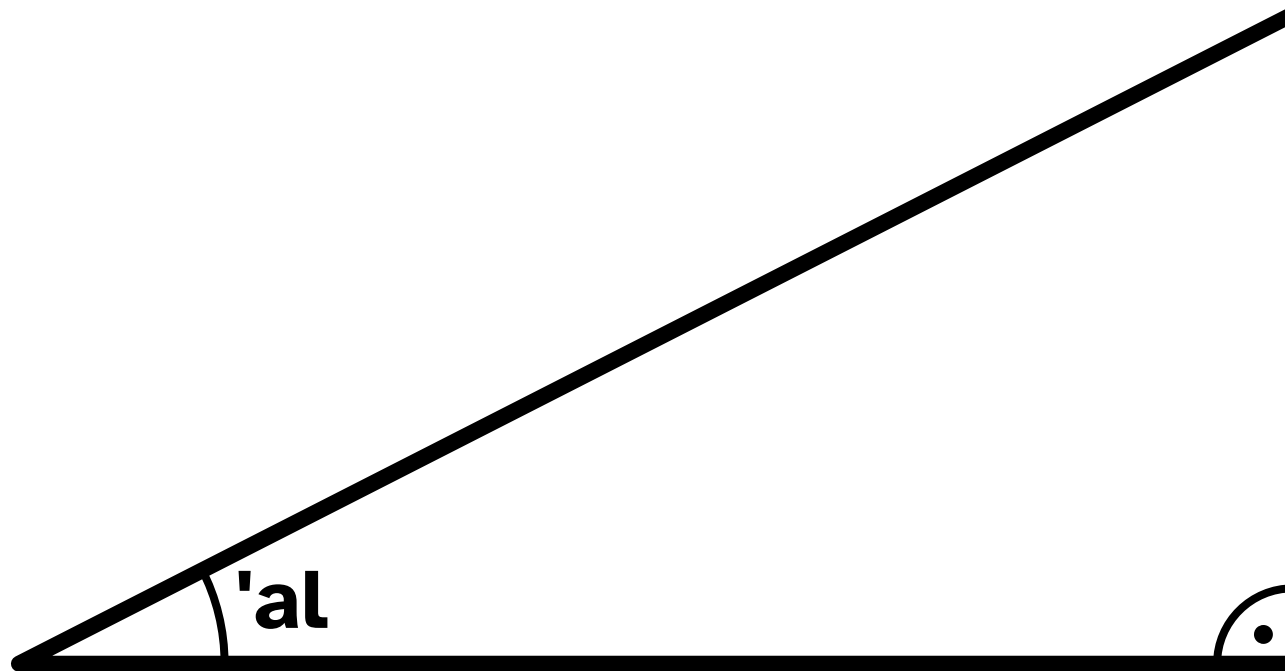








Lösung



100 cm

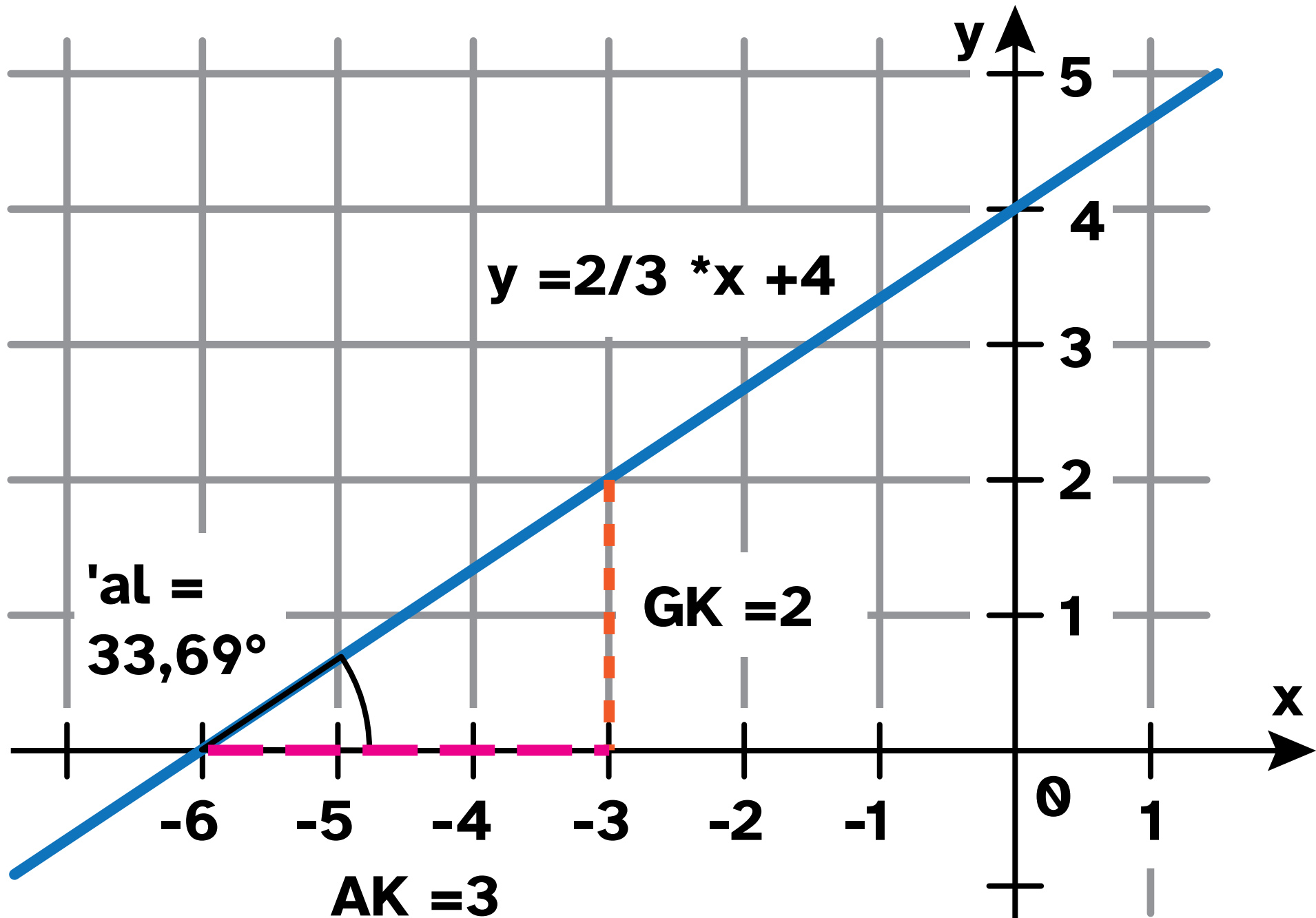
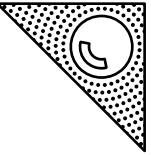
Horizontalfentfernung

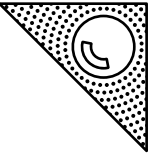
= AK von 'al

6 cm

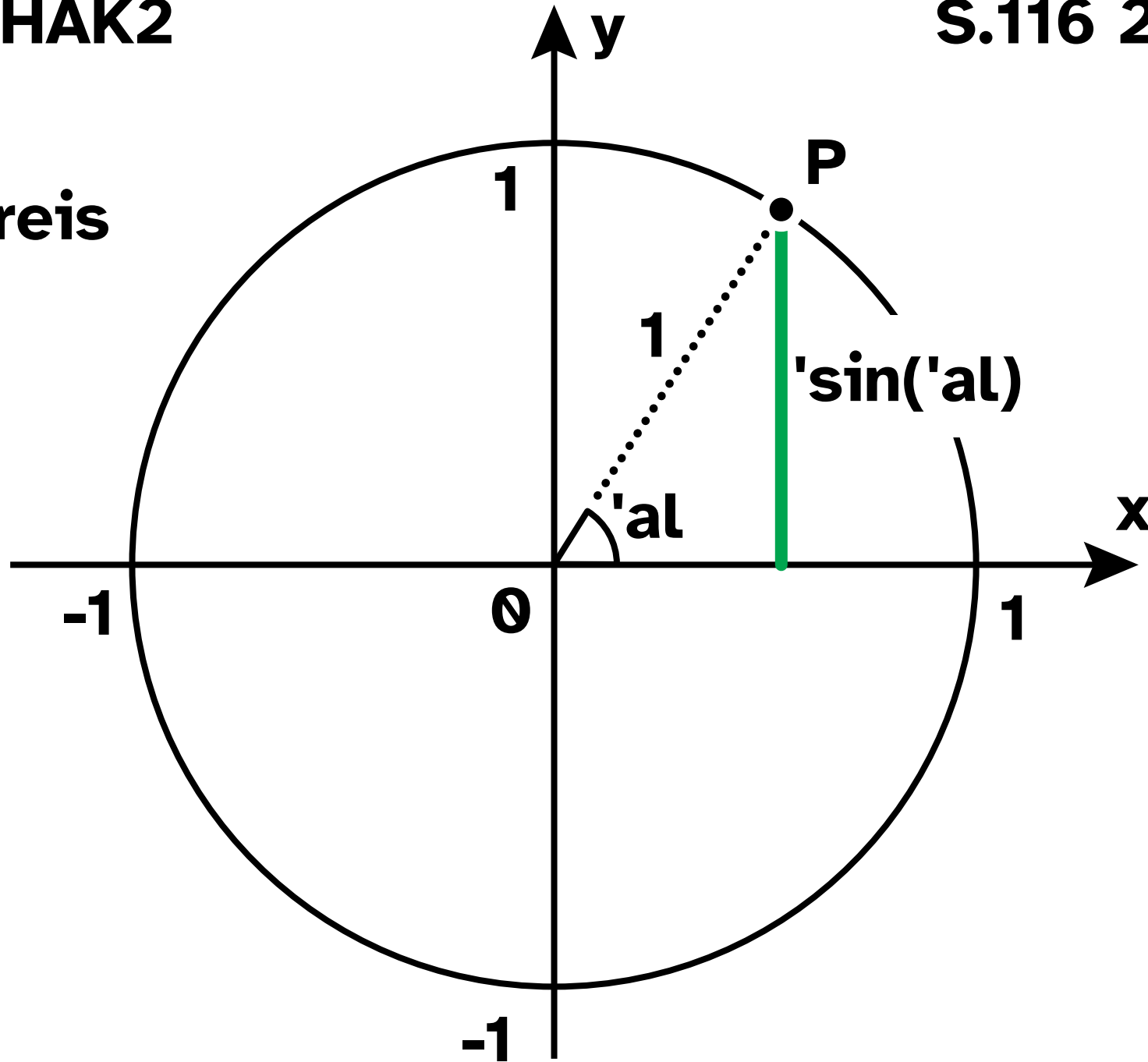
Höhenunterschied

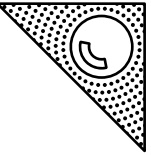
= GK von 'al



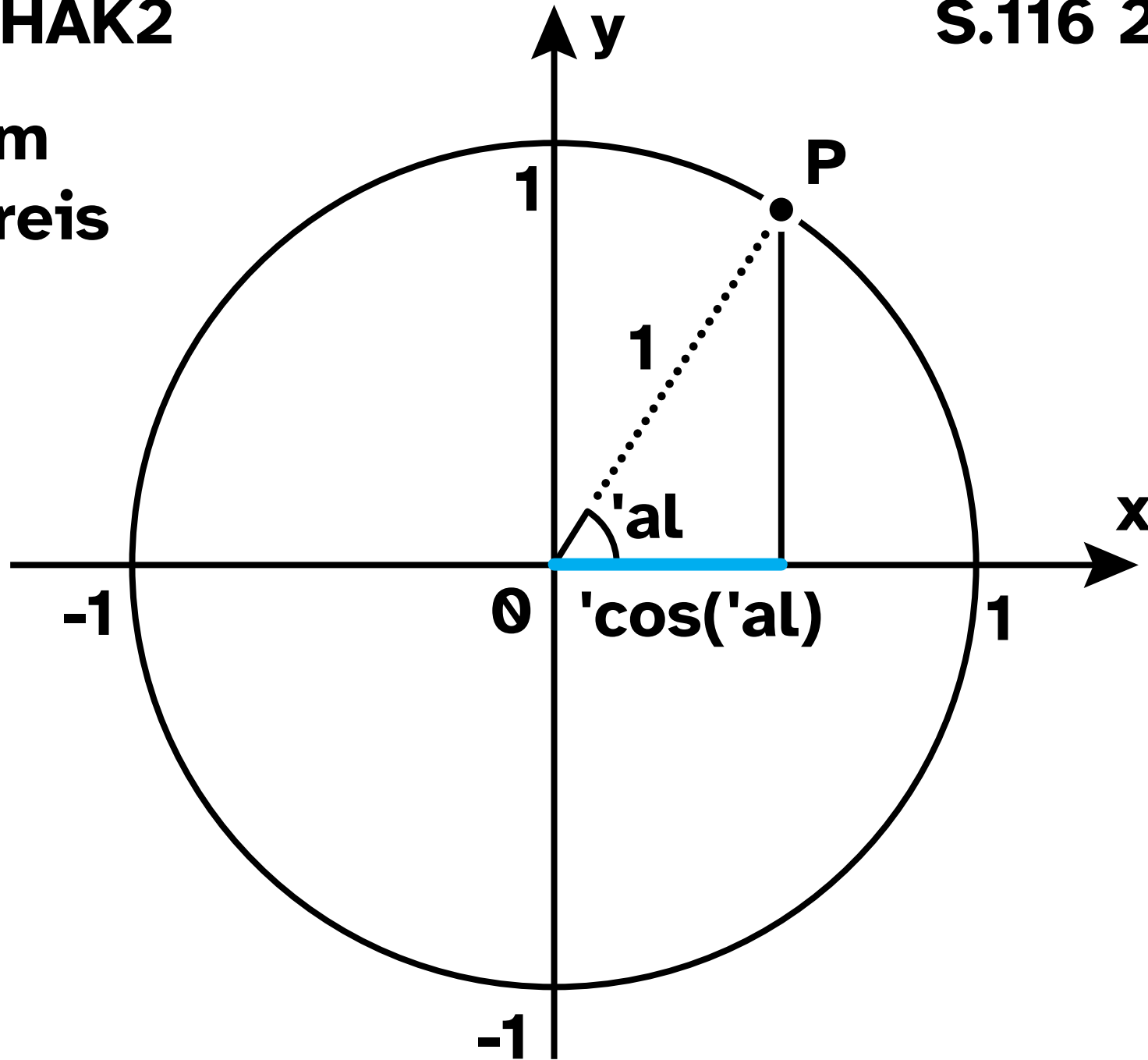


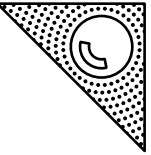
Sinus im Einheitskreis



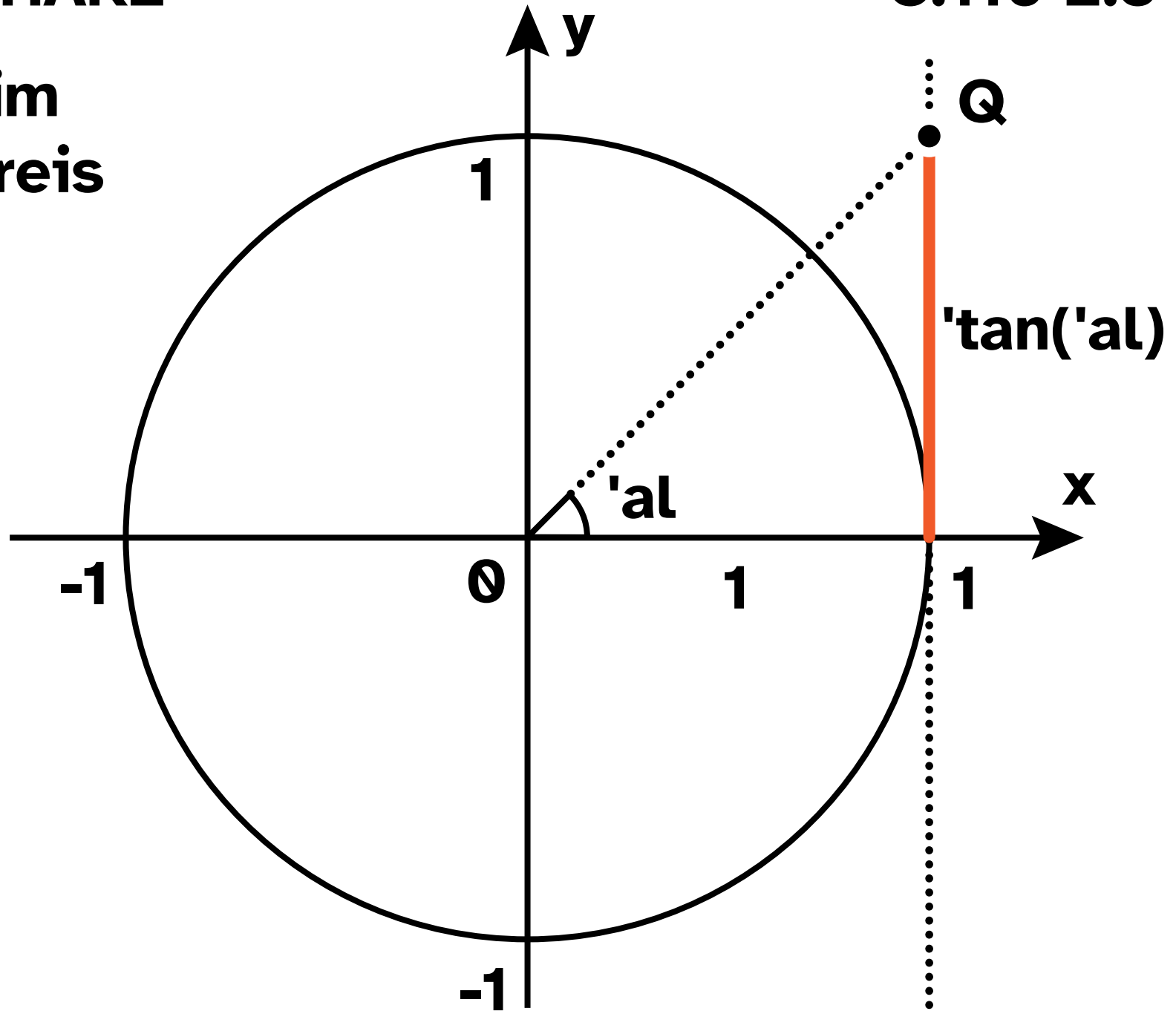


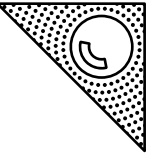
Cosinus im Einheitskreis






Tangens im
Einheitskreis




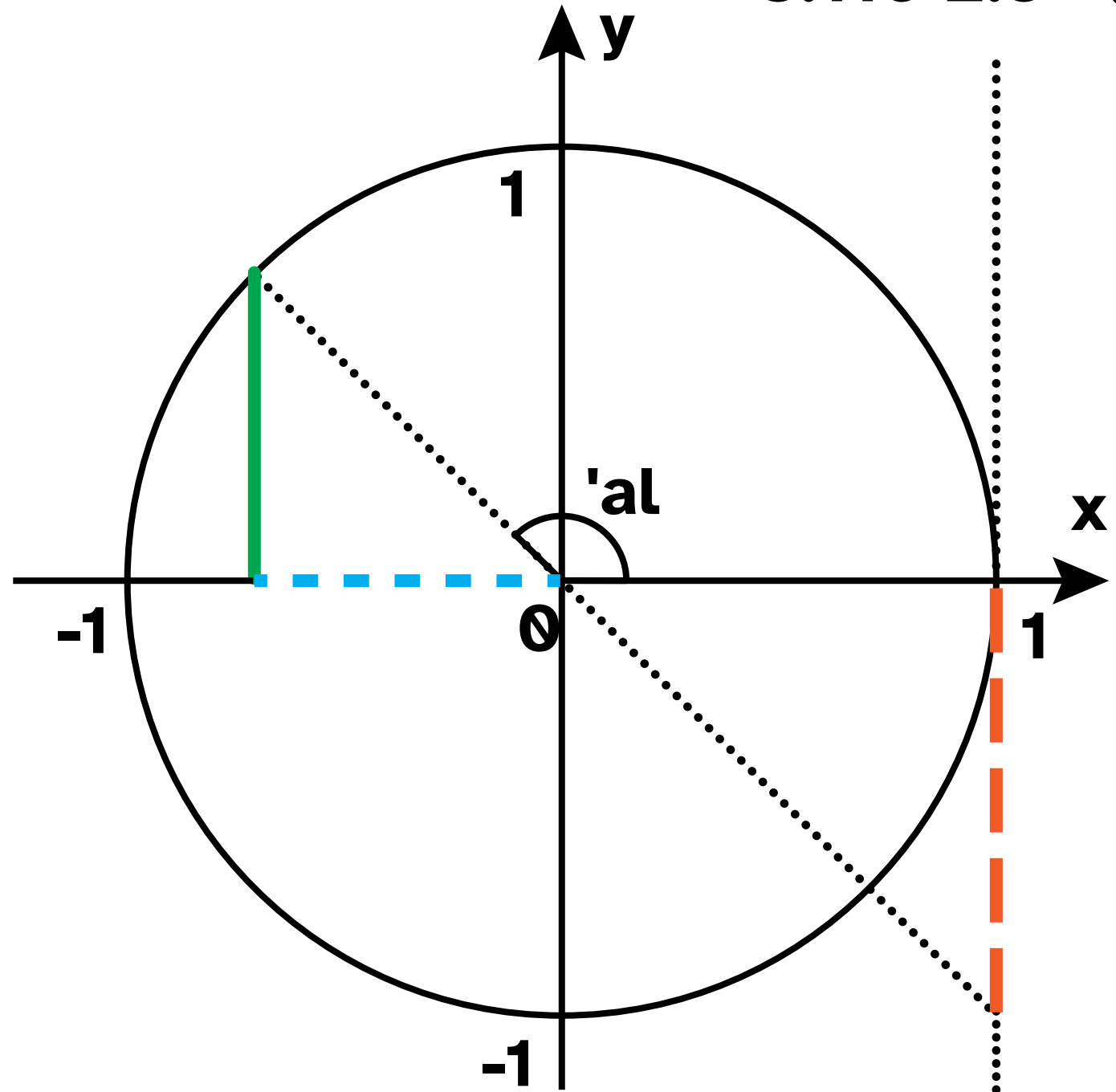


$90^\circ < \alpha < 180^\circ$

'sin('α): 

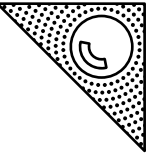
'cos('α): 

'tan('α): 





Ang.Mat. HAK2


S.116 2.3

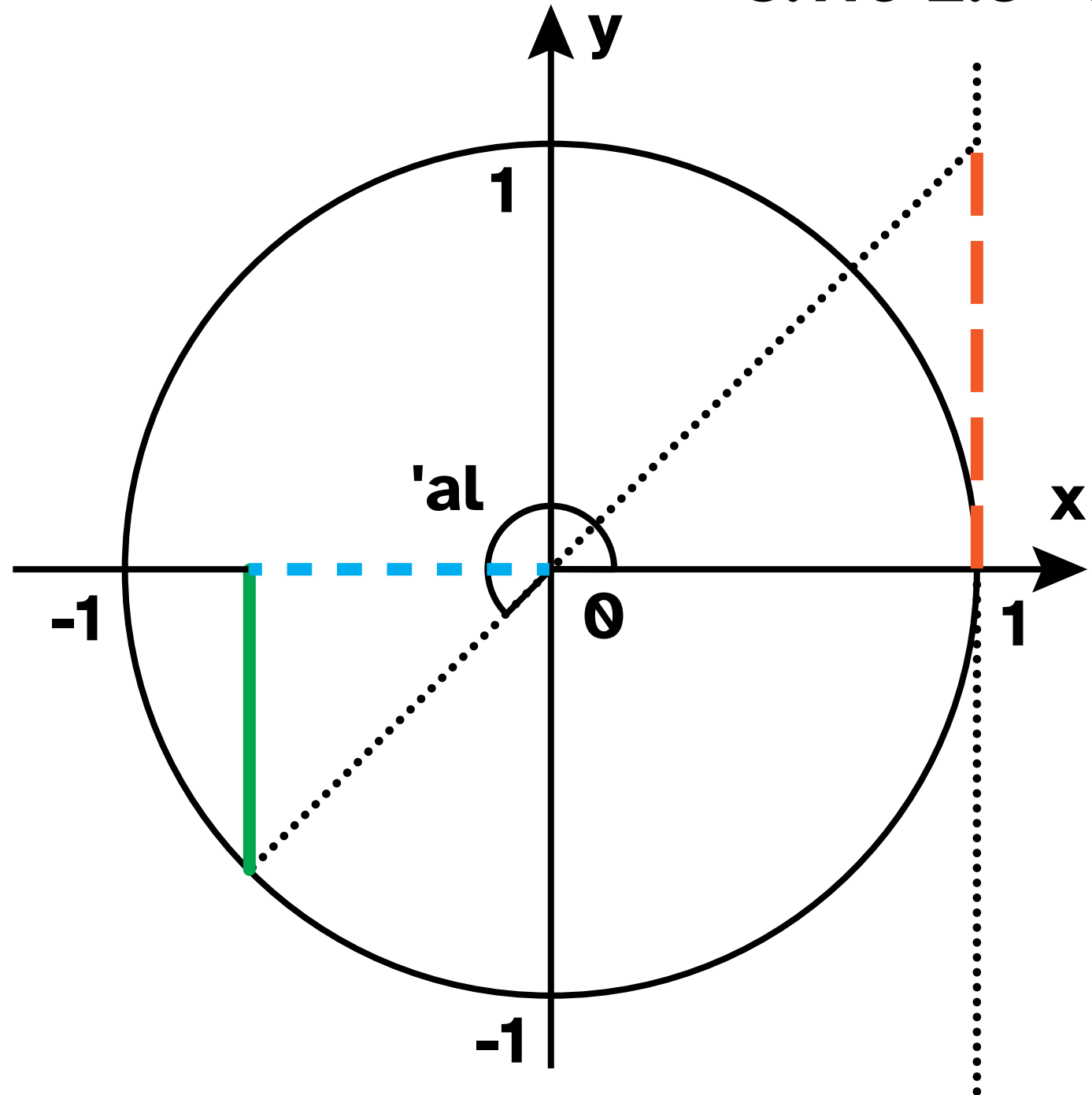


$90^\circ < \alpha < 180^\circ$

'sin('al): 

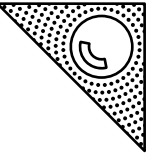
'cos('al): 

'tan('al): 





Ang.Mat. HAK2


S.116 2.3

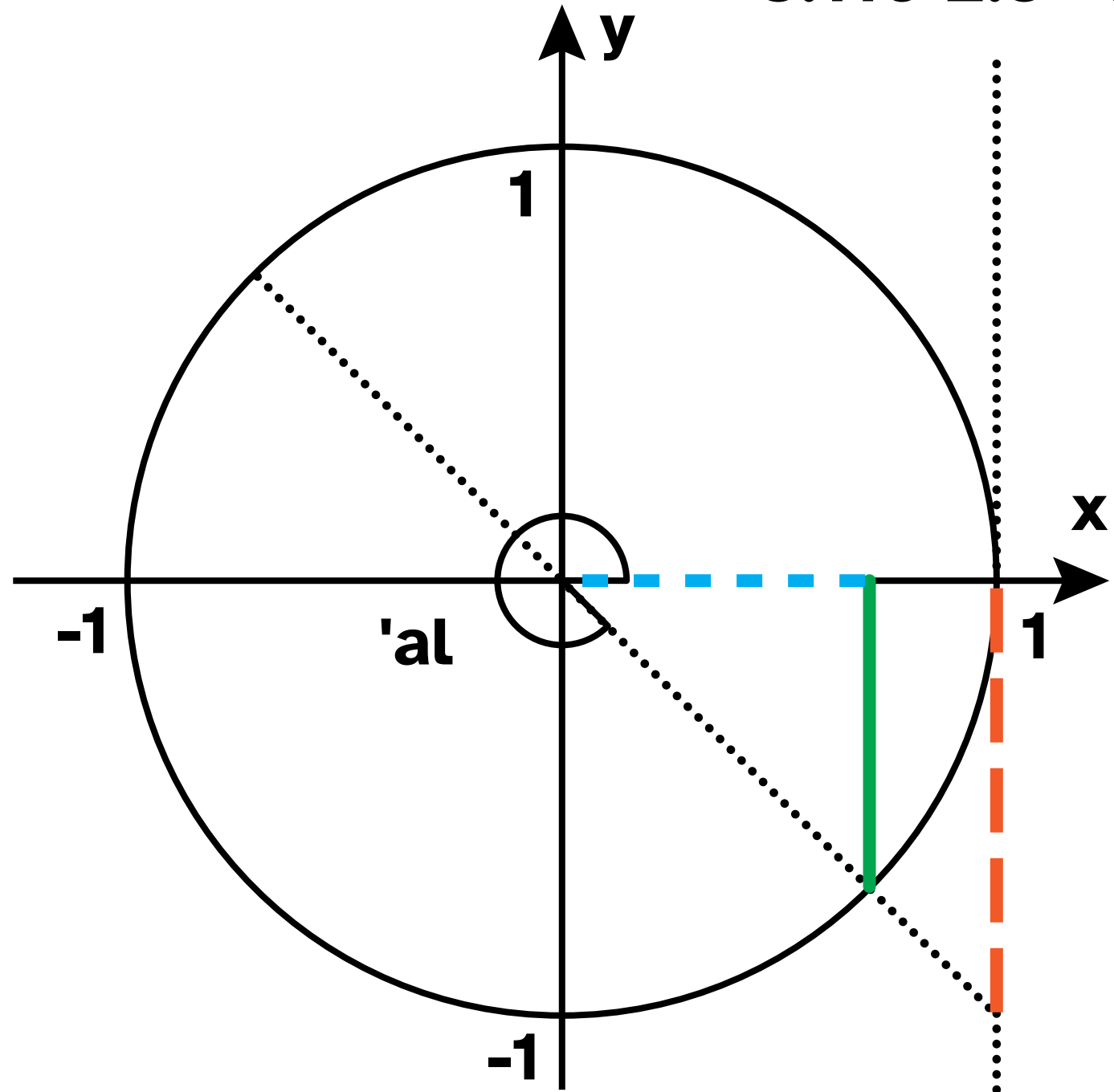


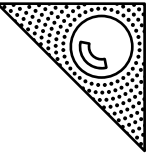
$90^\circ < \alpha < 180^\circ$


'sin('al): 


'cos('al): 


'tan('al): 

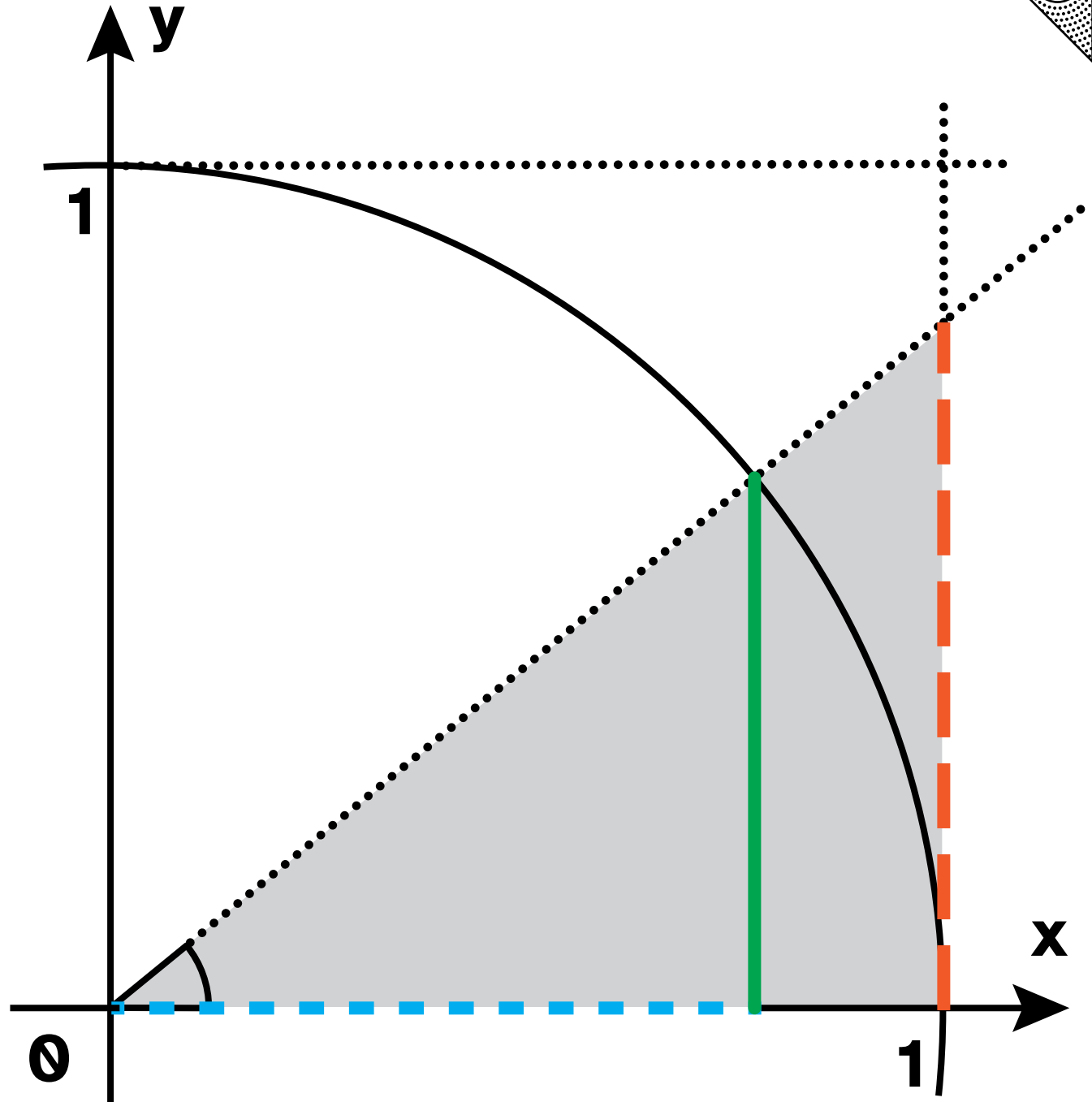


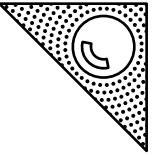


'sin('aL): 

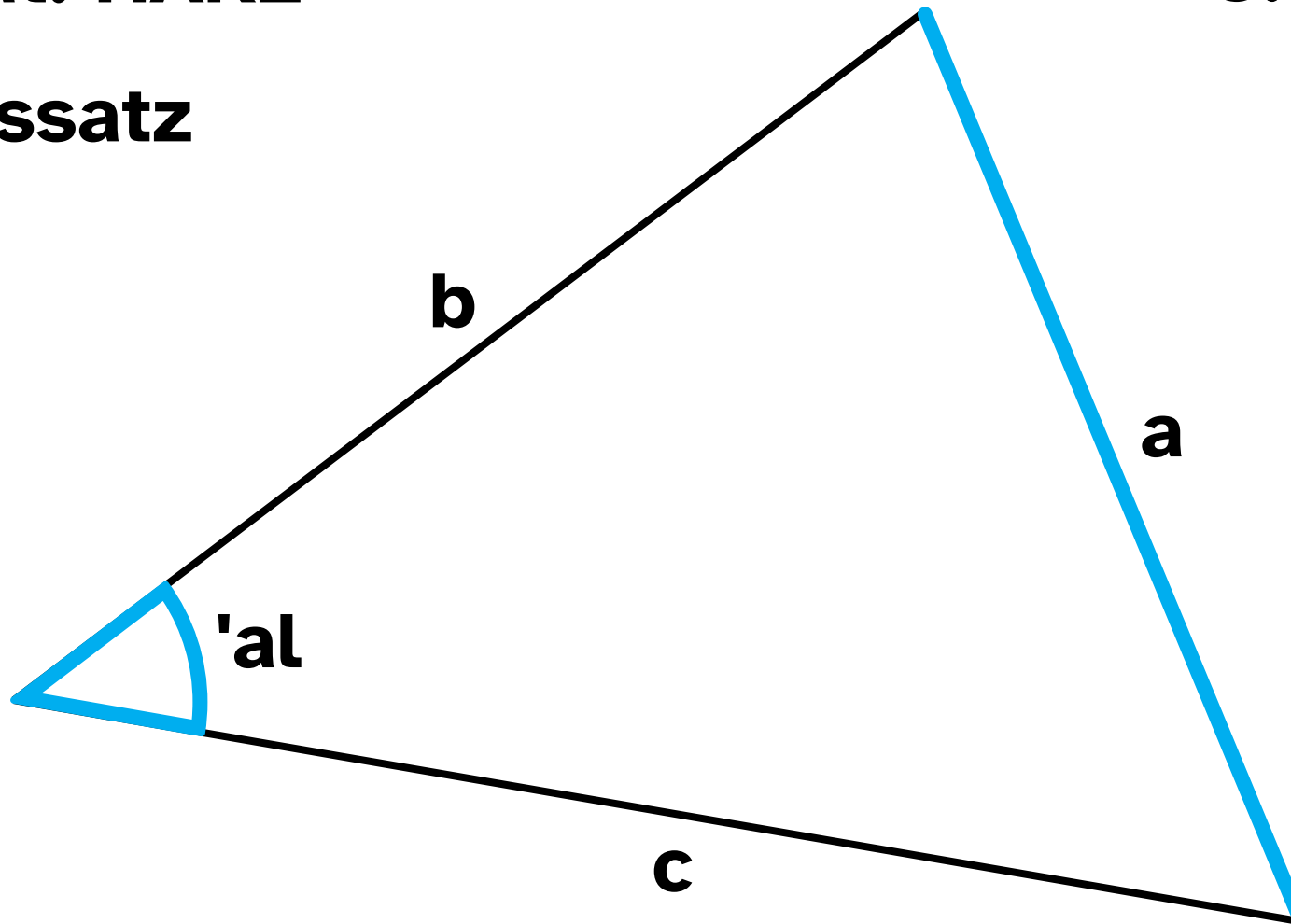
'cos('aL): 

'tan('aL): 



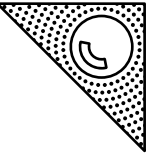


Cosinussatz

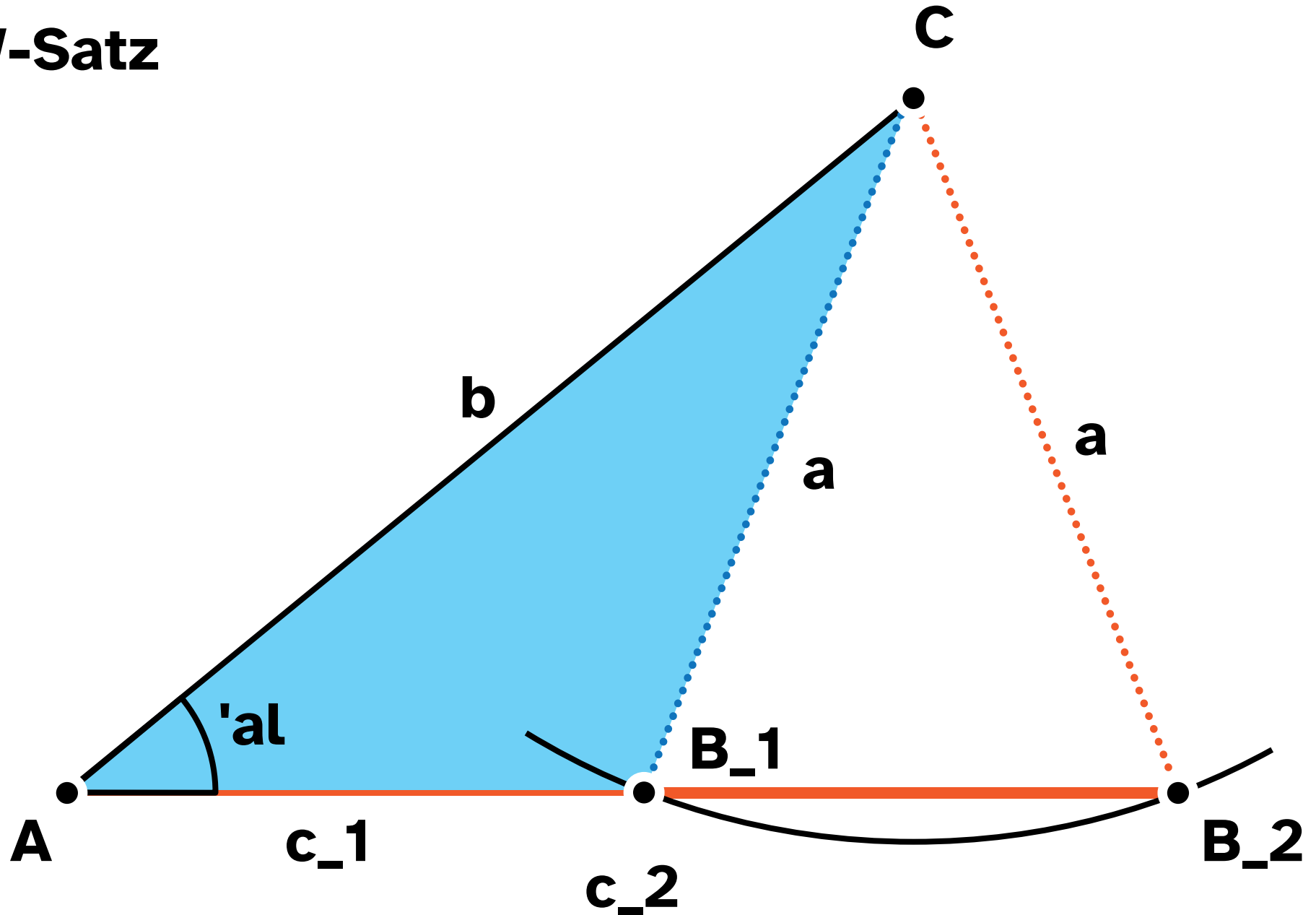


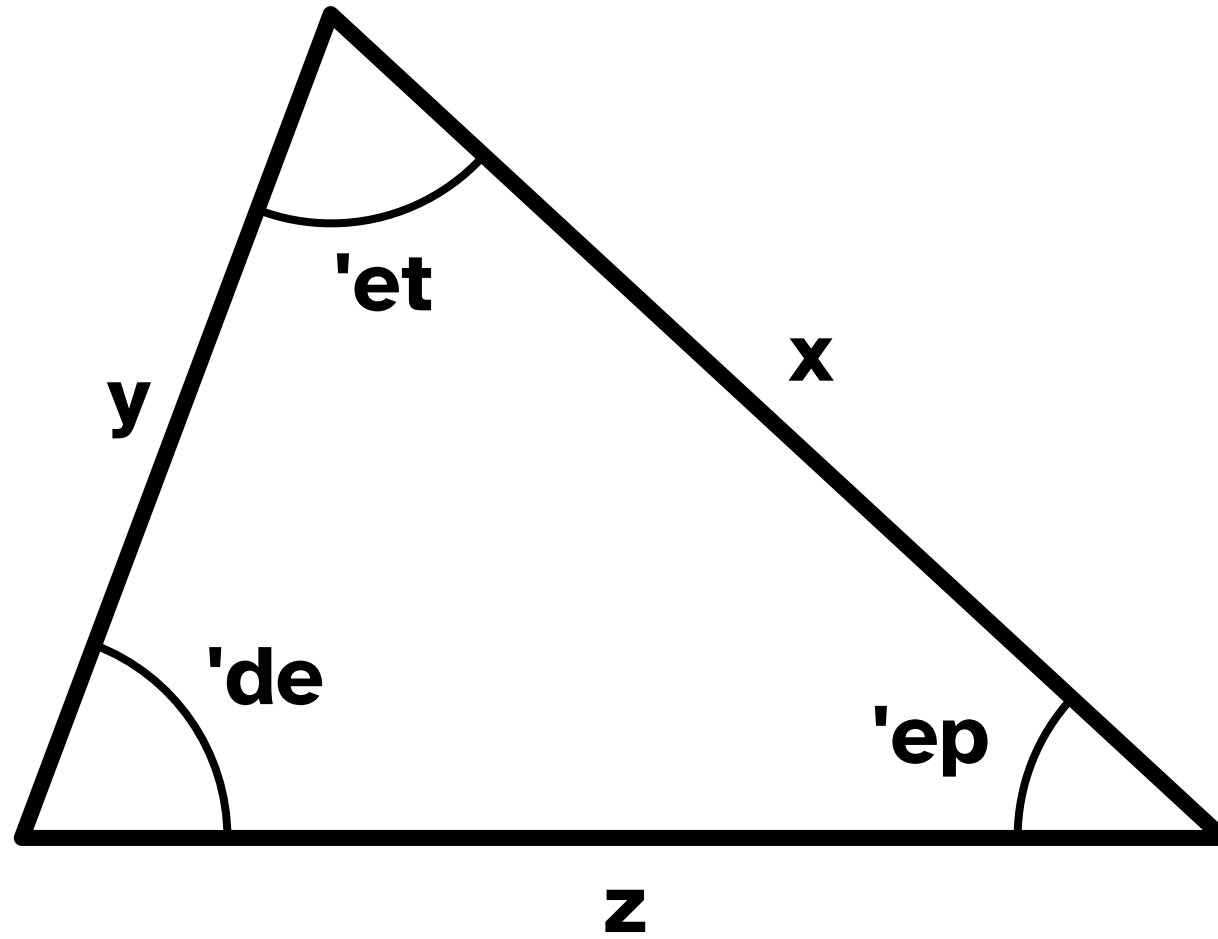
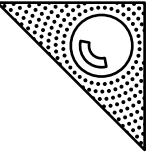
'al: von b und c eingeschlossener Winkel

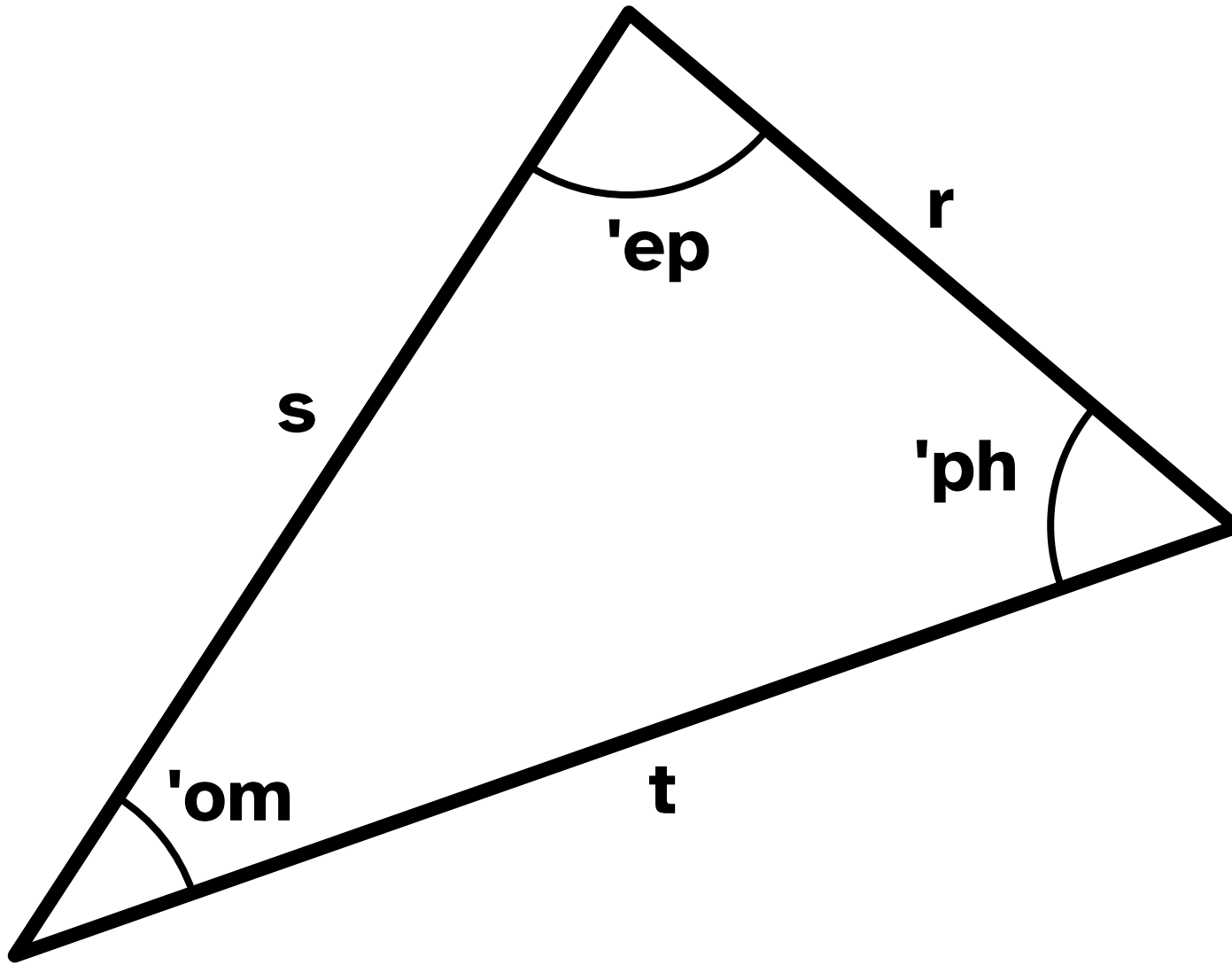
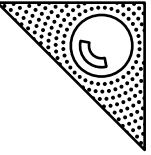
a: dem Winkel 'al gegenüberliegende Seite

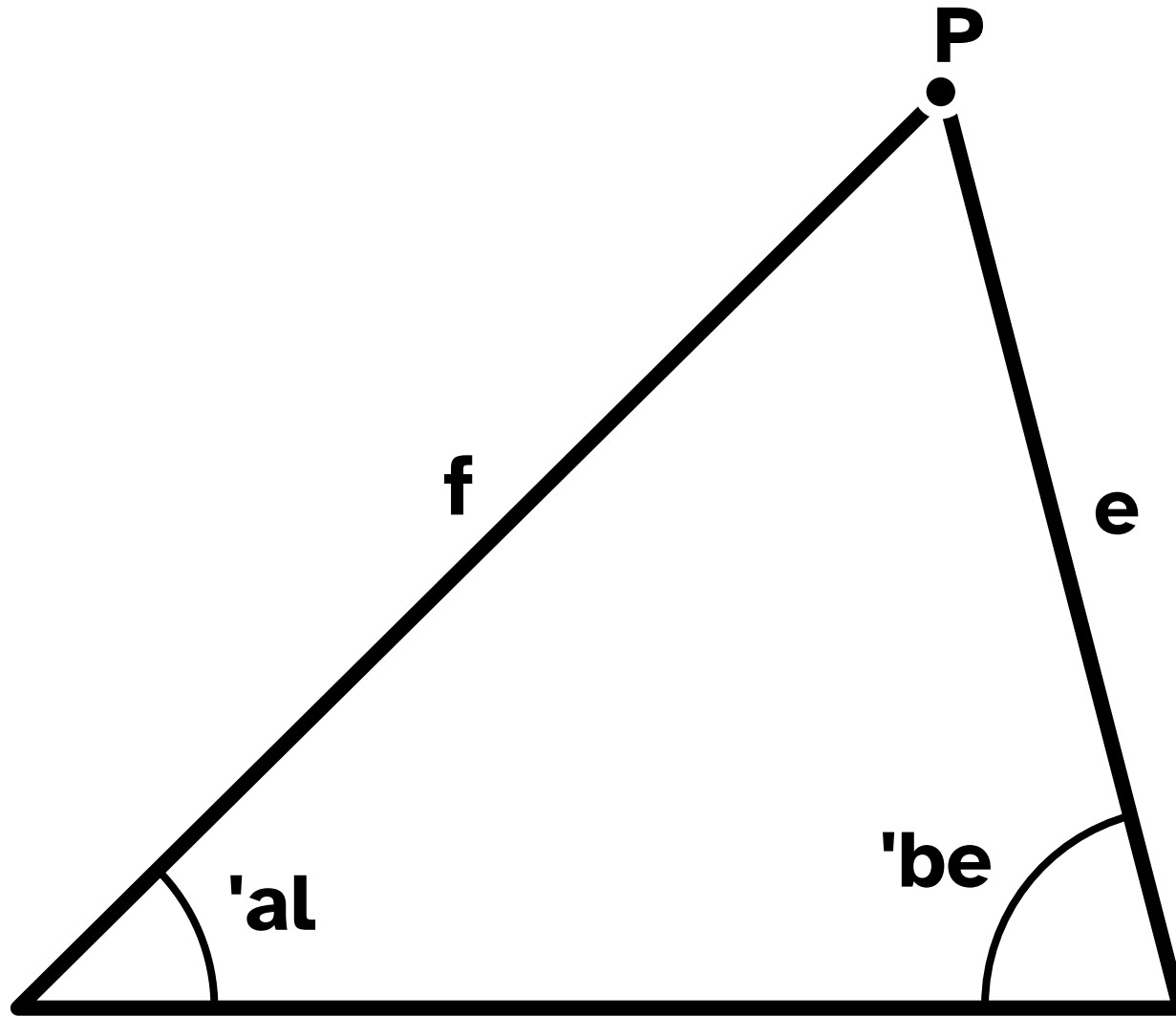
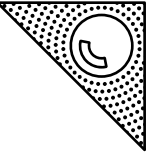


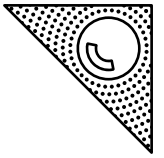
SSW-Satz







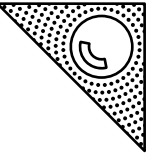




**Angewandte Mathematik
HAK Band 2**

**5.
Trigonometrie**

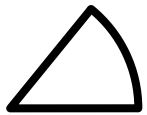
Teil 2, Seiten 120 - 138



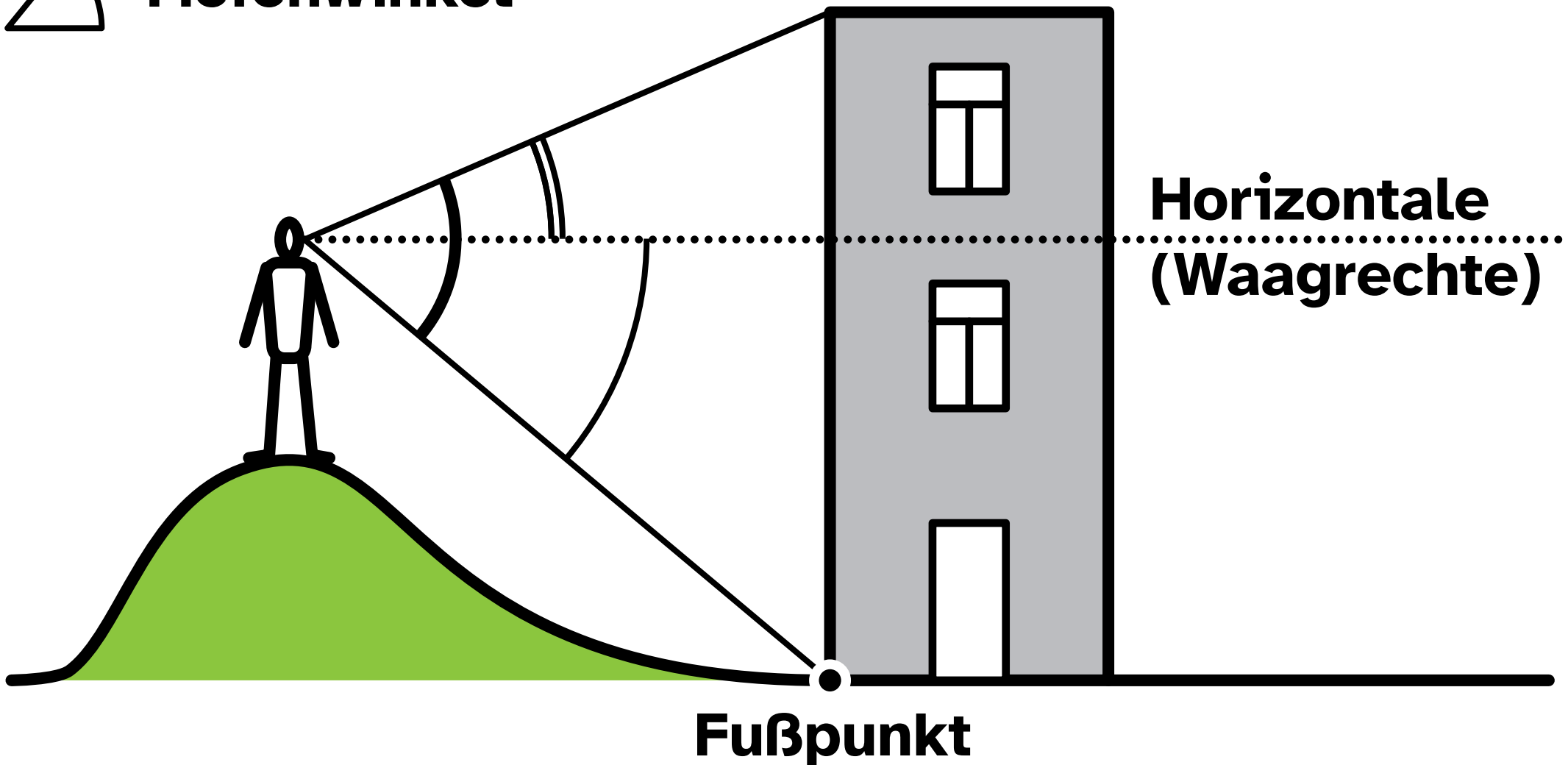
Sehwinkel

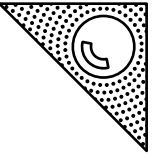


Höhenwinkel

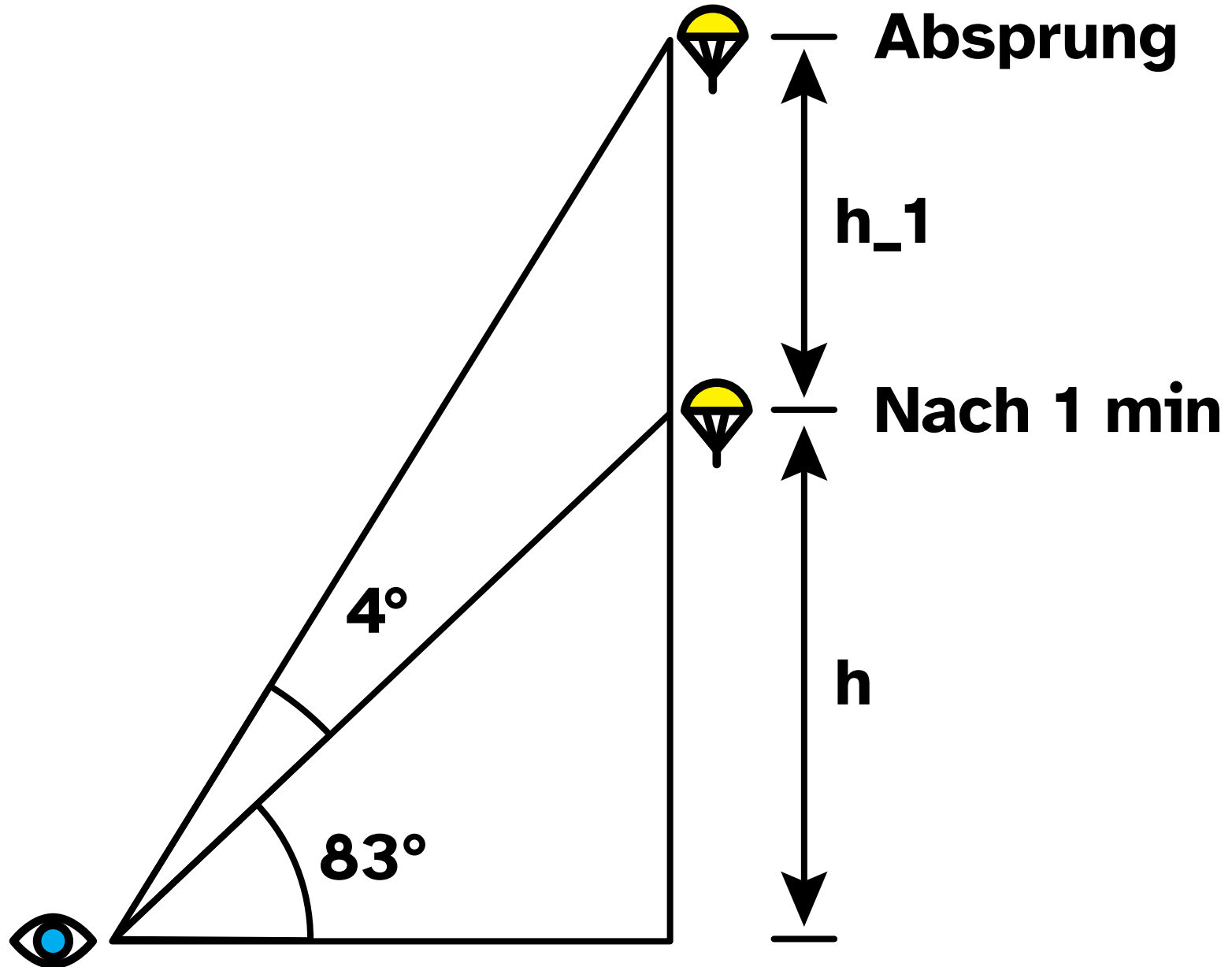


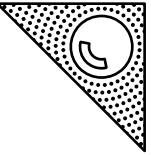
Tiefenwinkel



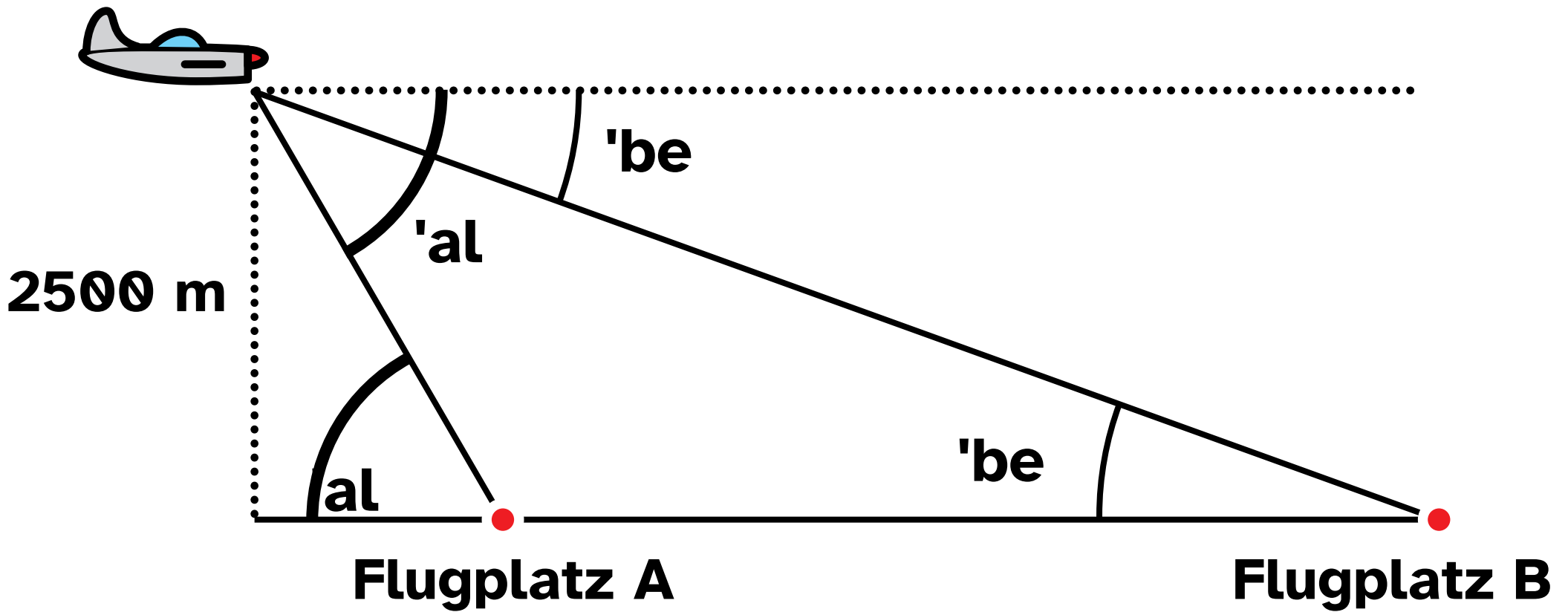


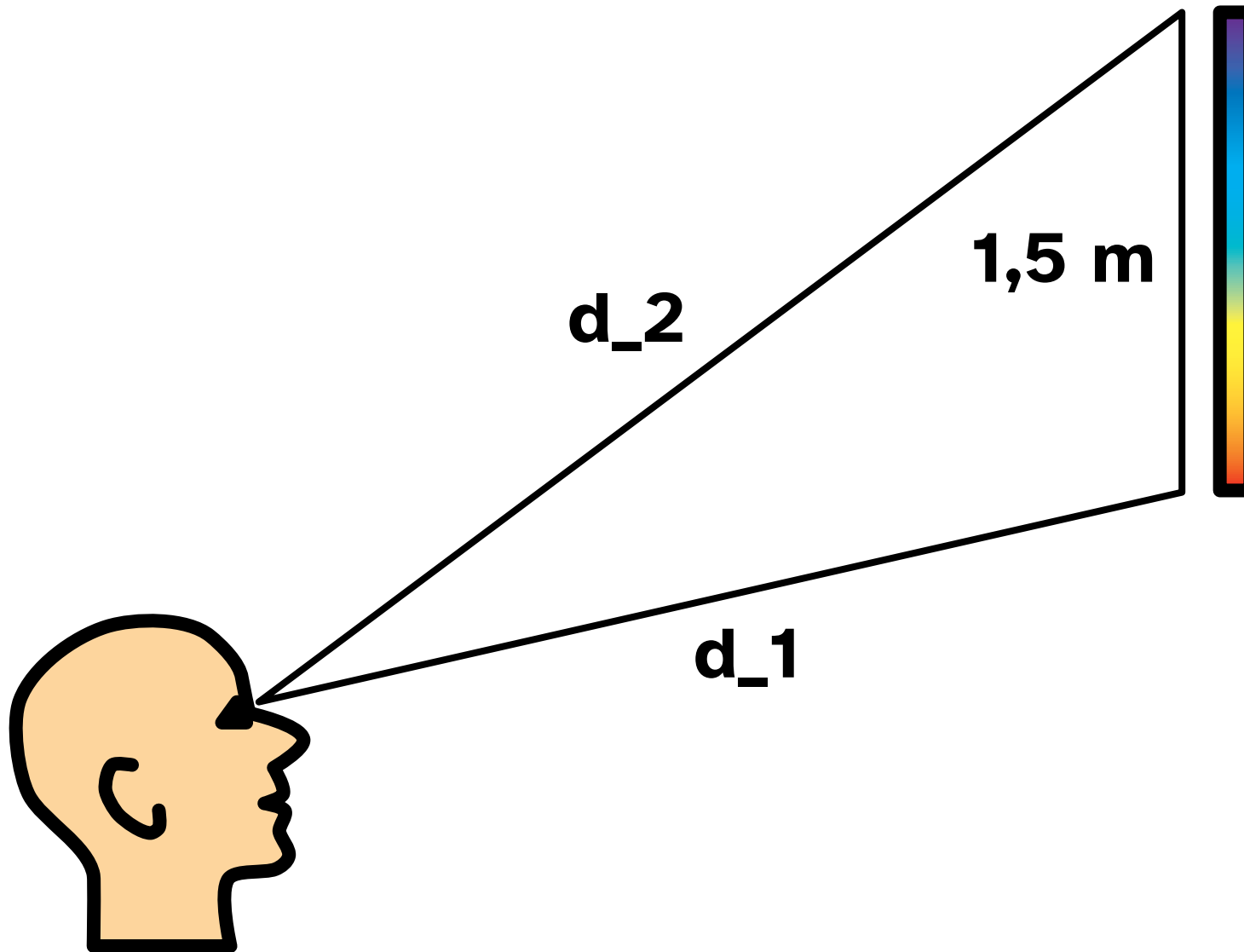
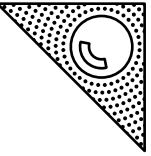
Lösung

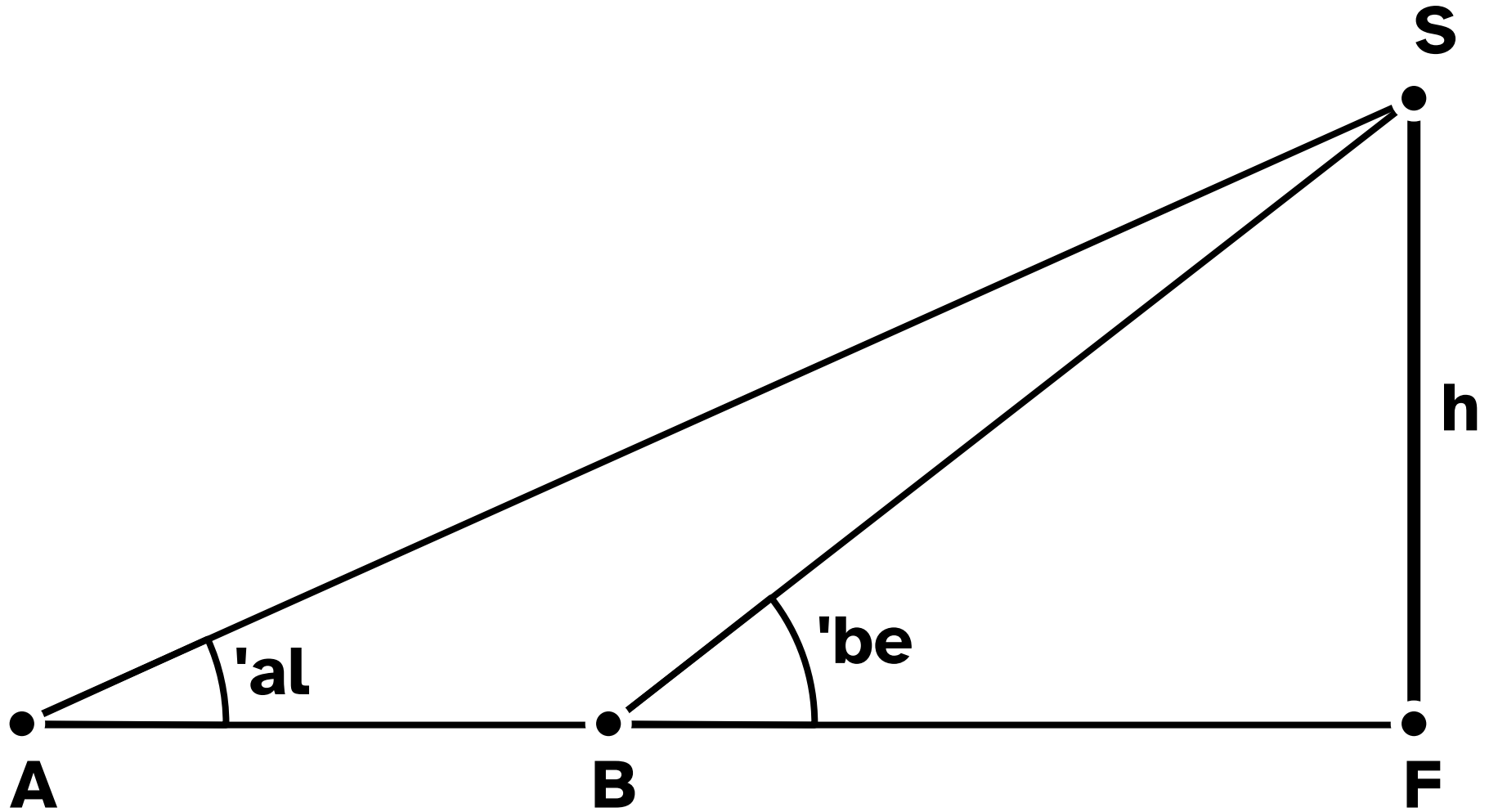
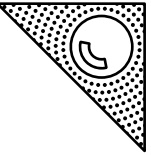




Lösung

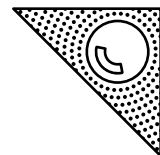






Ang.Mat. HAK2

S.121 5.87



1 min

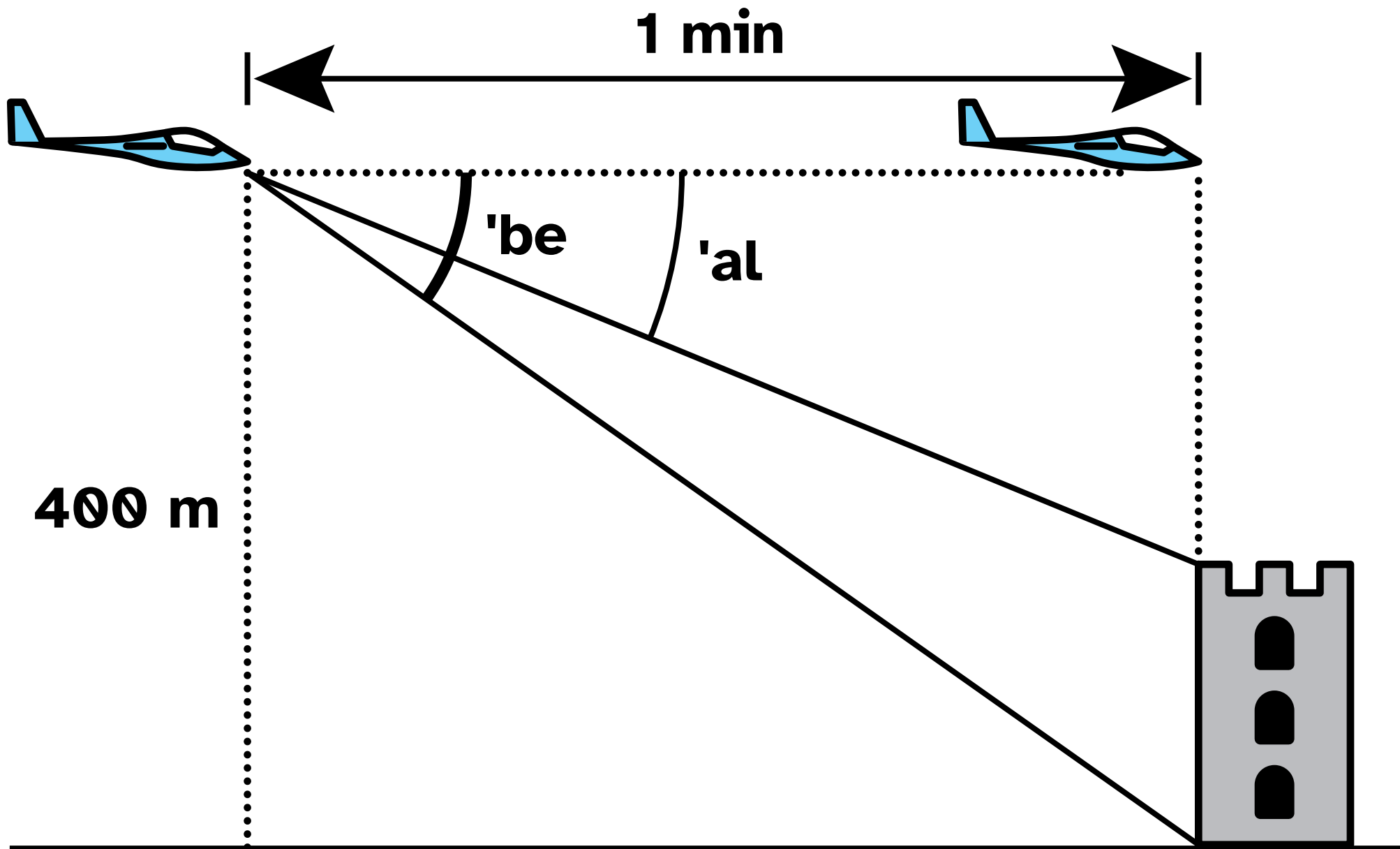


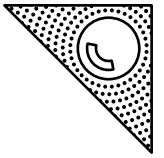
400 m

'be

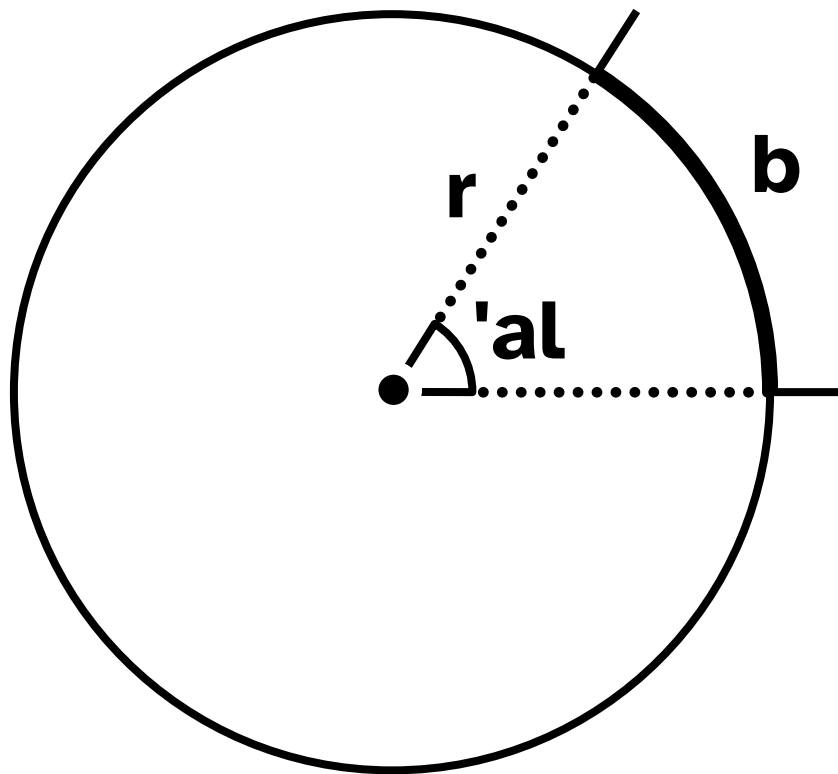
'al

Turm

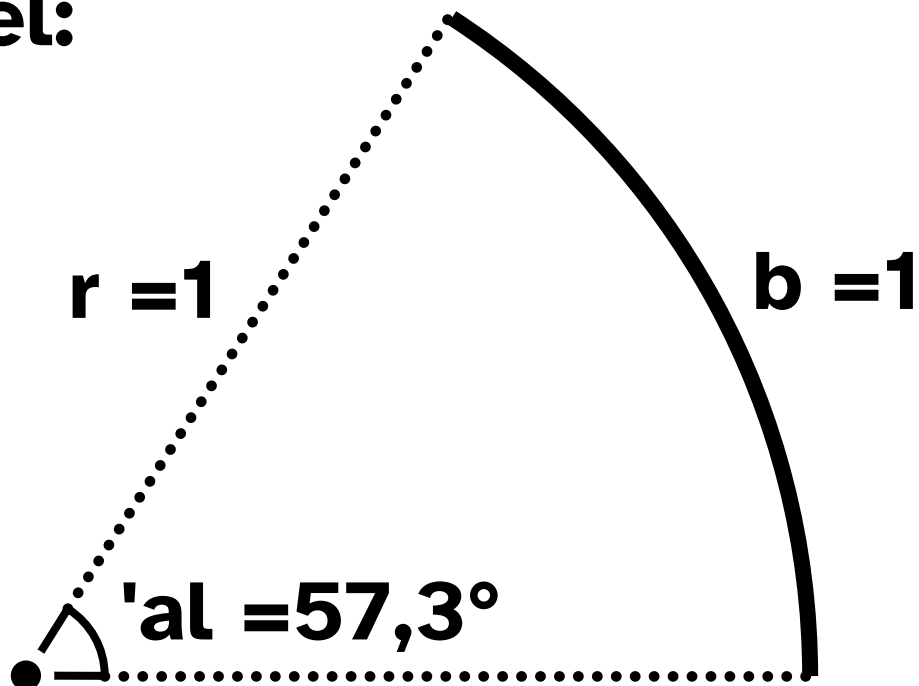


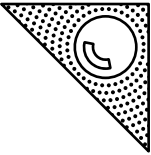


5.6 Winkelfunktionen - Maßsysteme



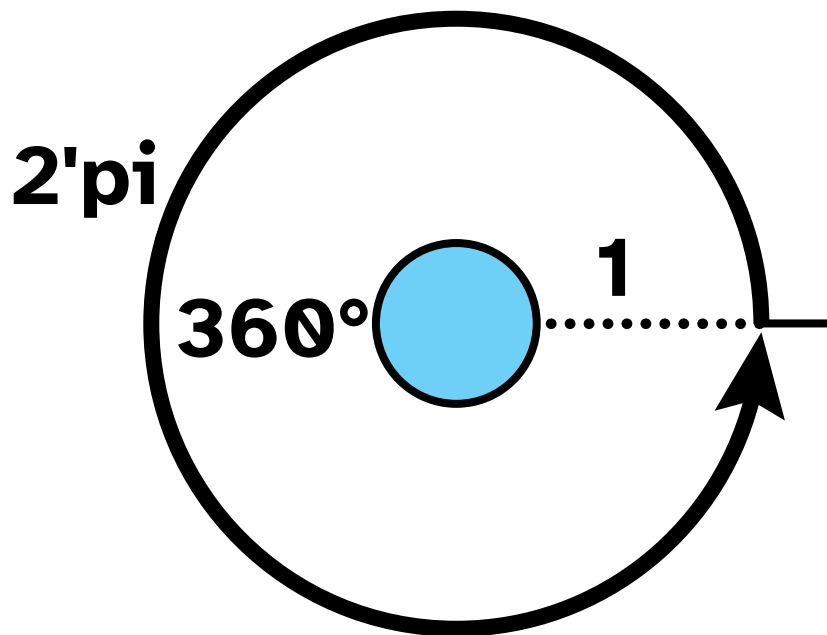
Beispiel:



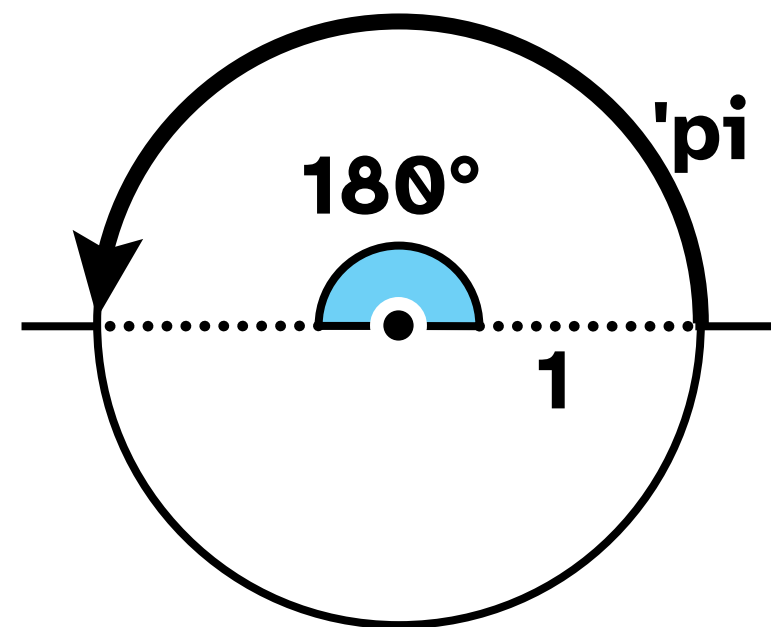


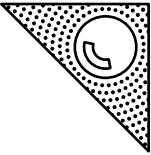
Besondere Winkel im Grad- und Bogenmaß 1/3

Ganze Drehung
Gradmaß: 360°
Bogenmaß: 2π



Halbe Drehung
Gradmaß: 180°
Bogenmaß: π



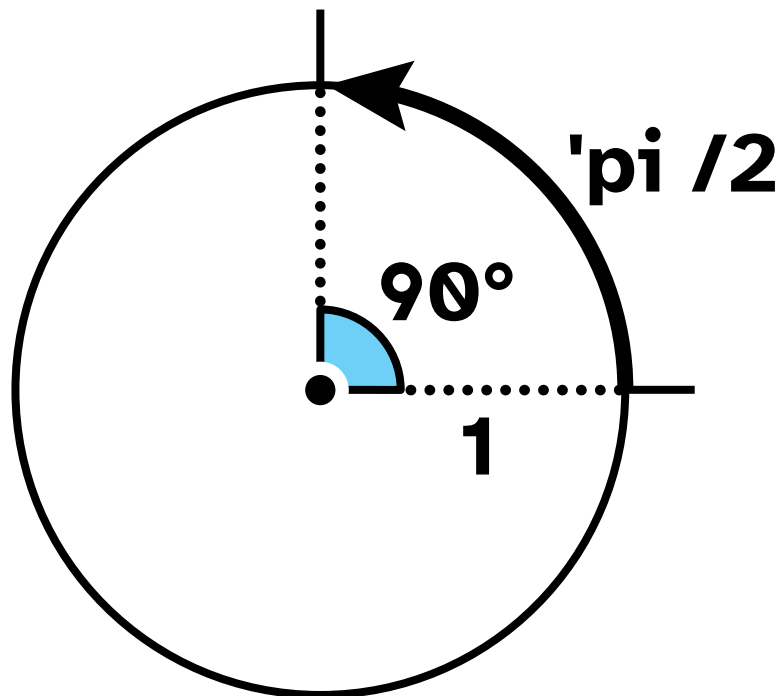


Besondere Winkel im Grad- und Bogenmaß 2/3

Vierteldrehung

Gradmaß: 90°

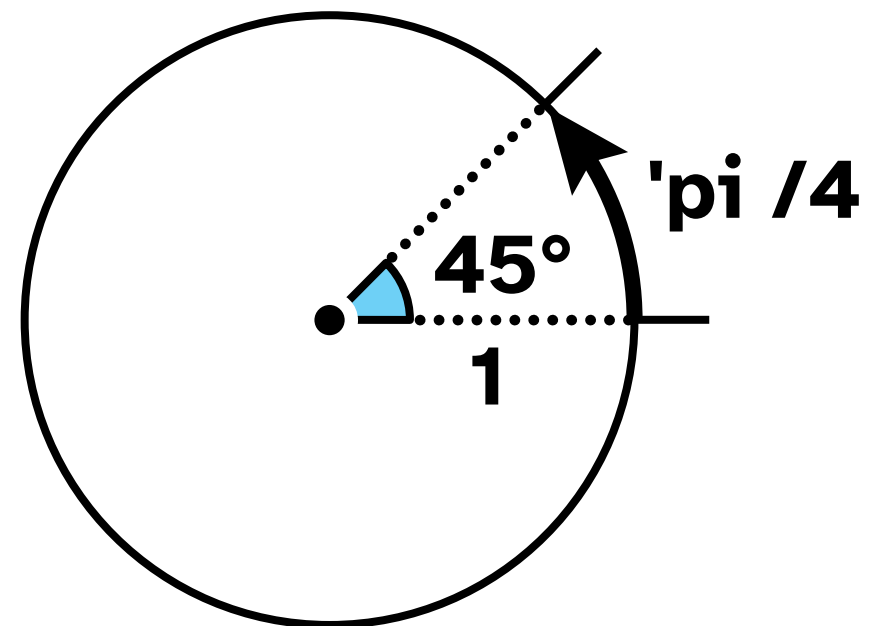
Bogenmaß: $\pi / 2$

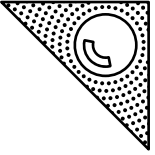


Achteldrehung

Gradmaß: 45°

Bogenmaß: $\pi / 4$



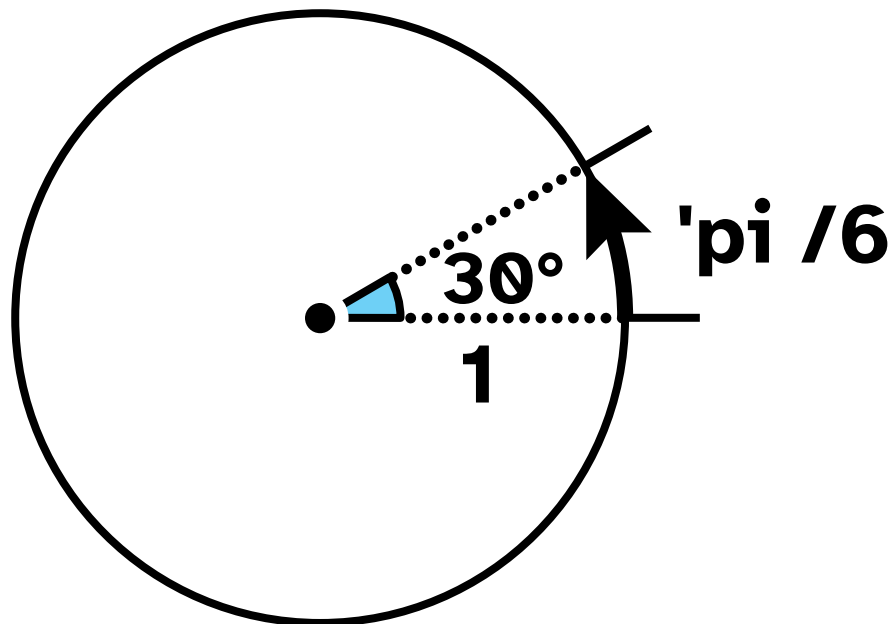


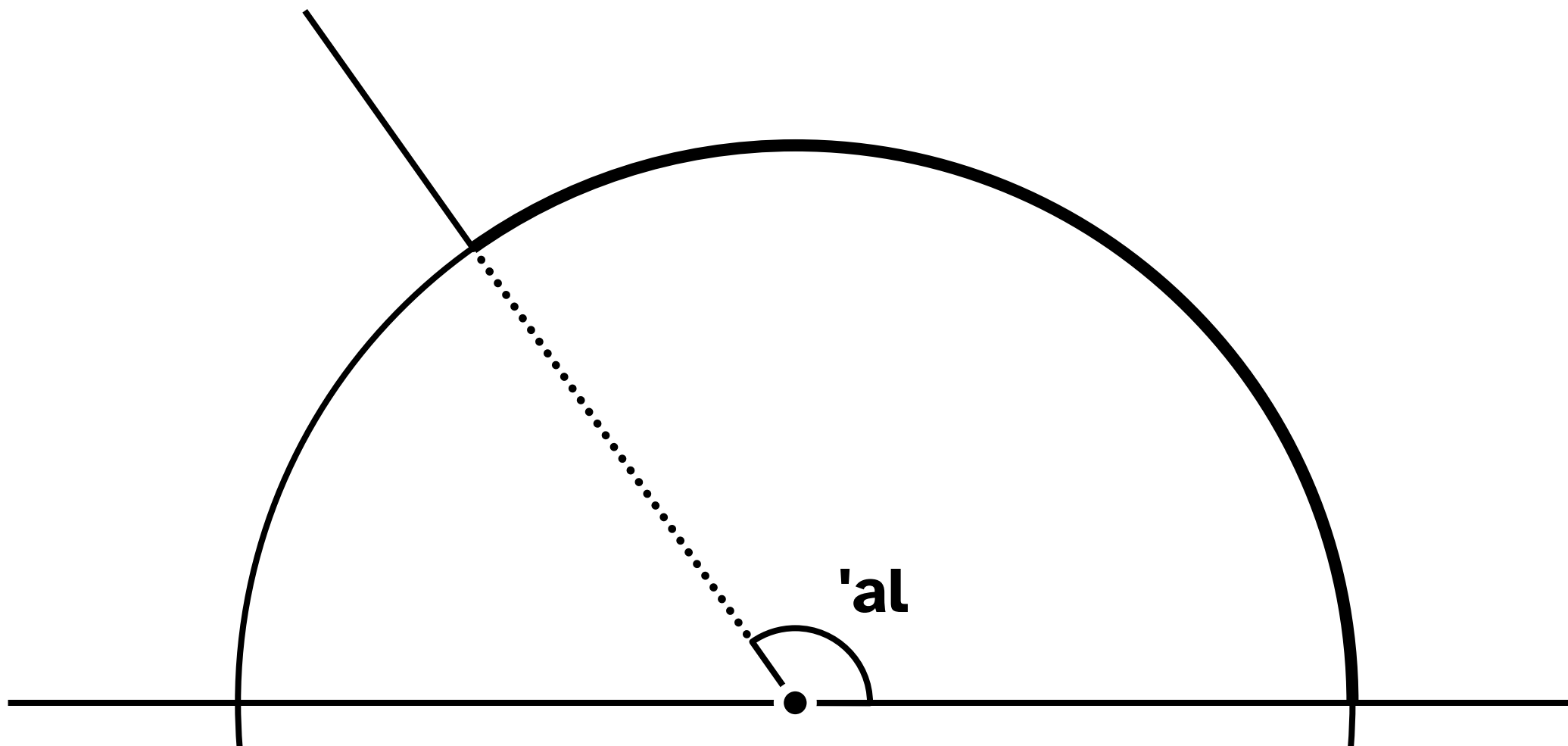
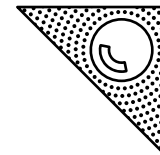
Besondere Winkel im Grad- und Bogenmaß 3/3

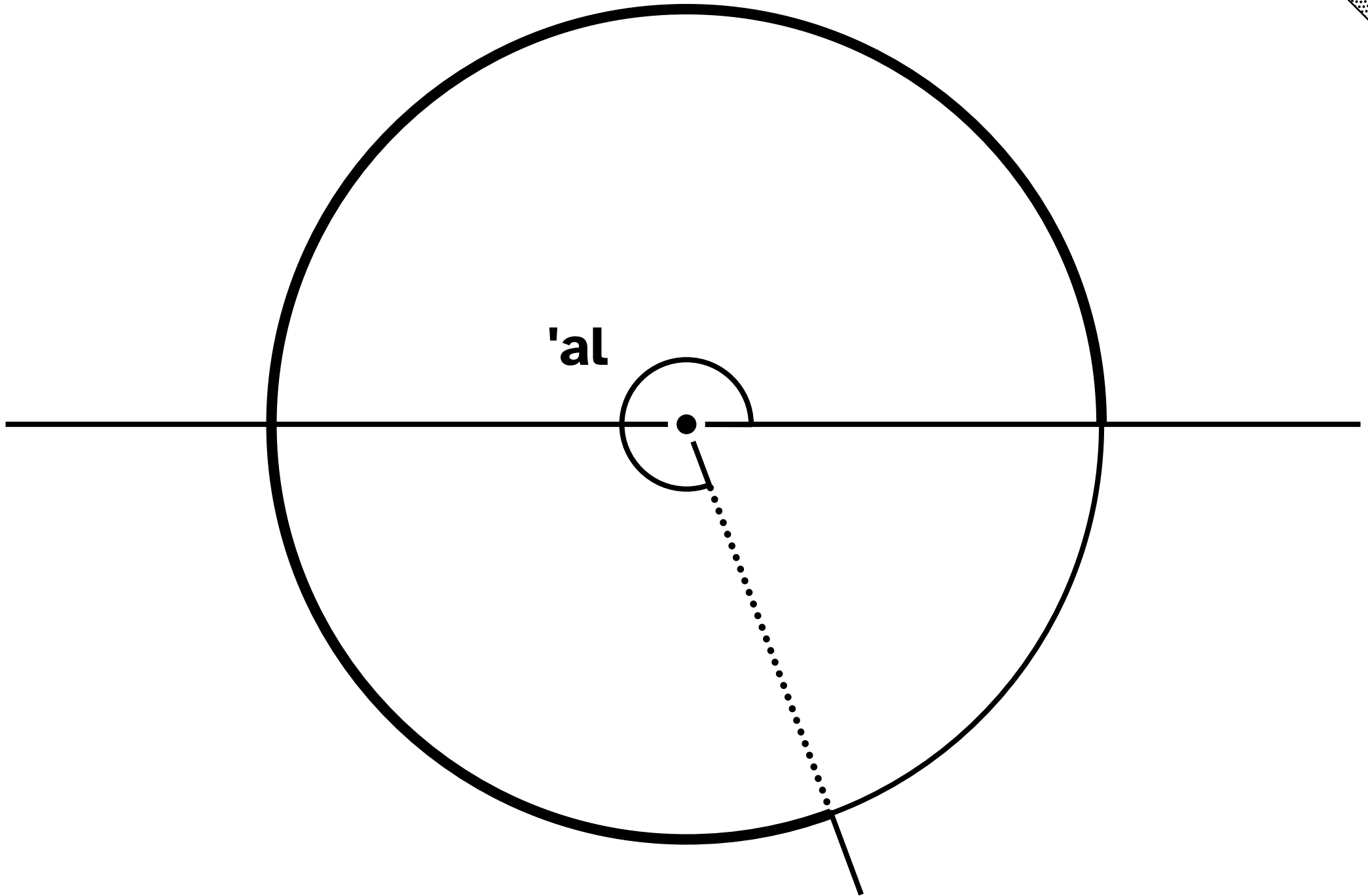
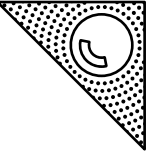
Zwölfteldrehung

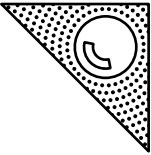
Gradmaß: 30°

Bogenmaß: $\pi / 6$

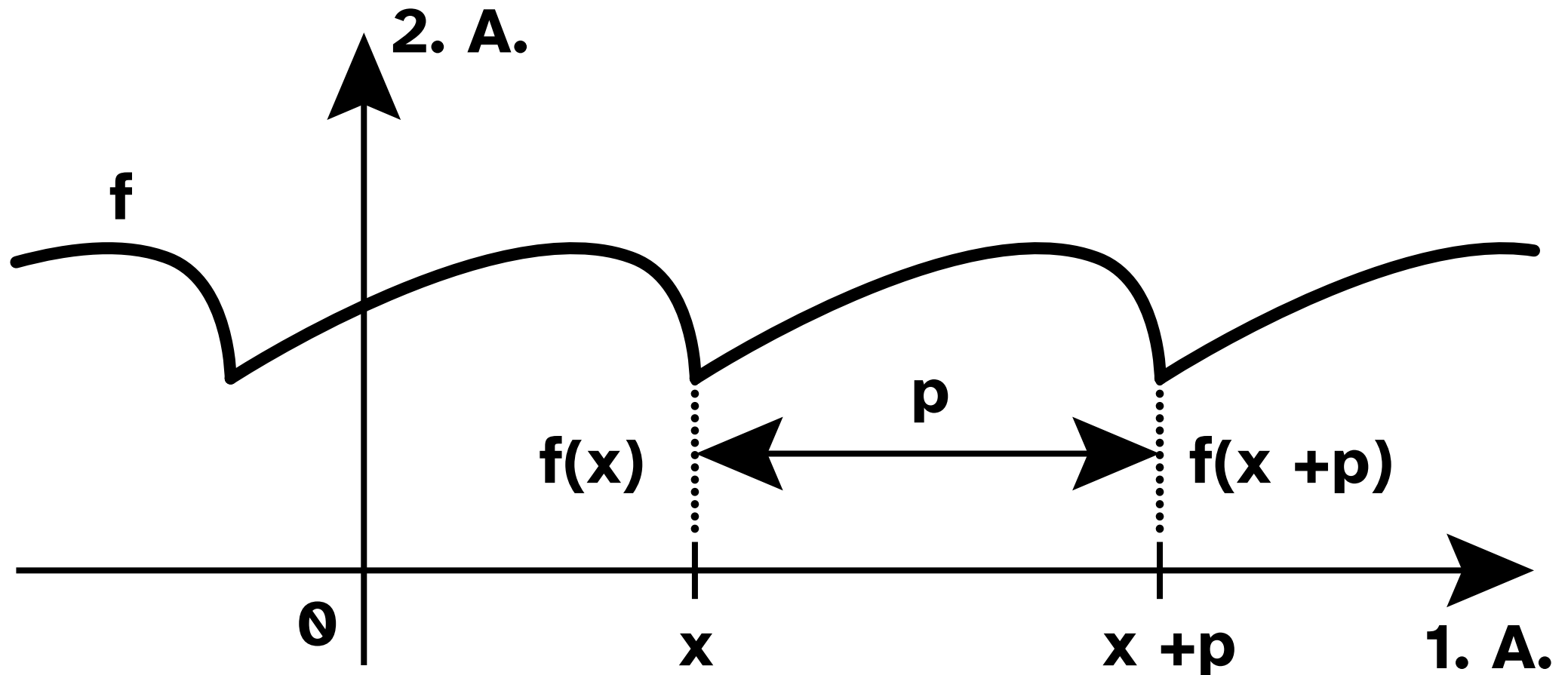


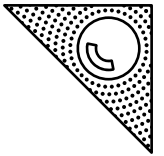




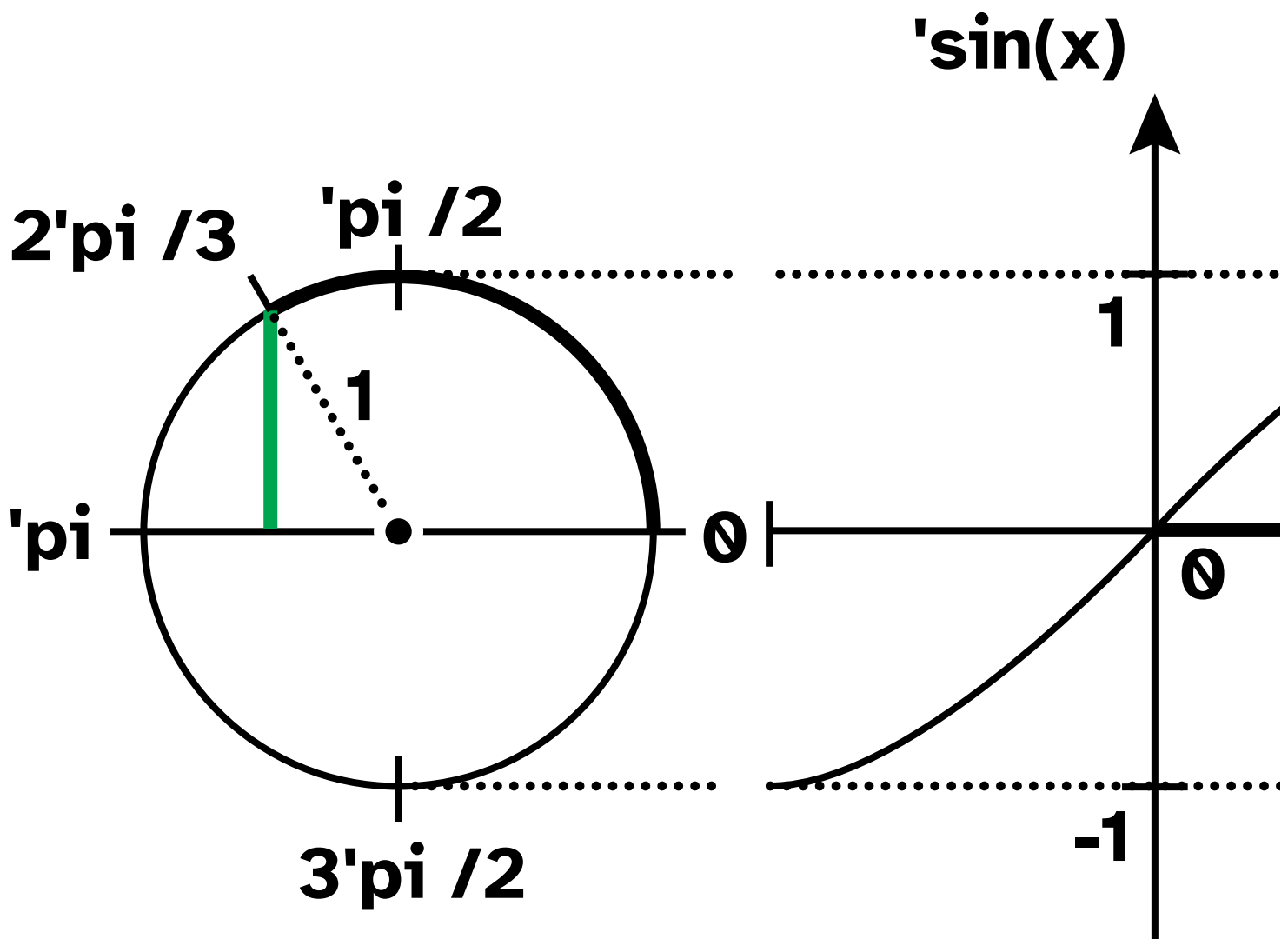


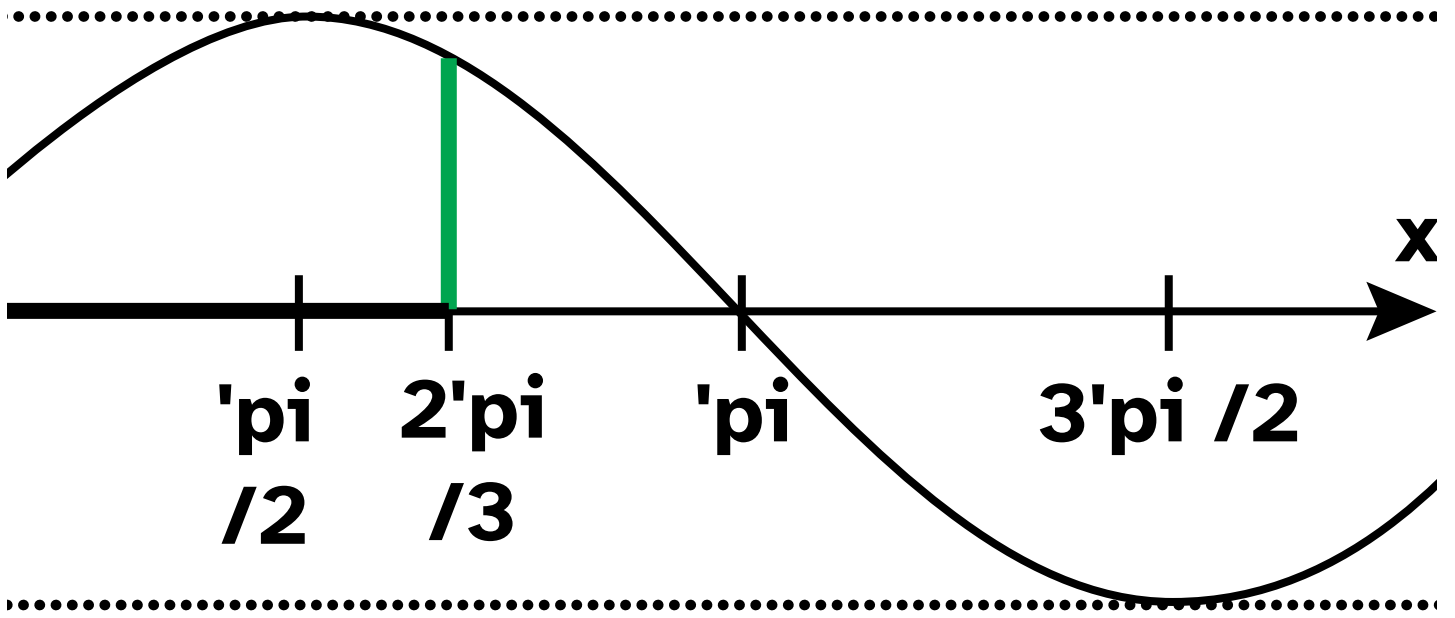
Graphen der Winkelfunktionen und Periodizität

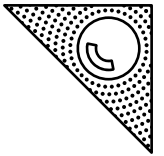




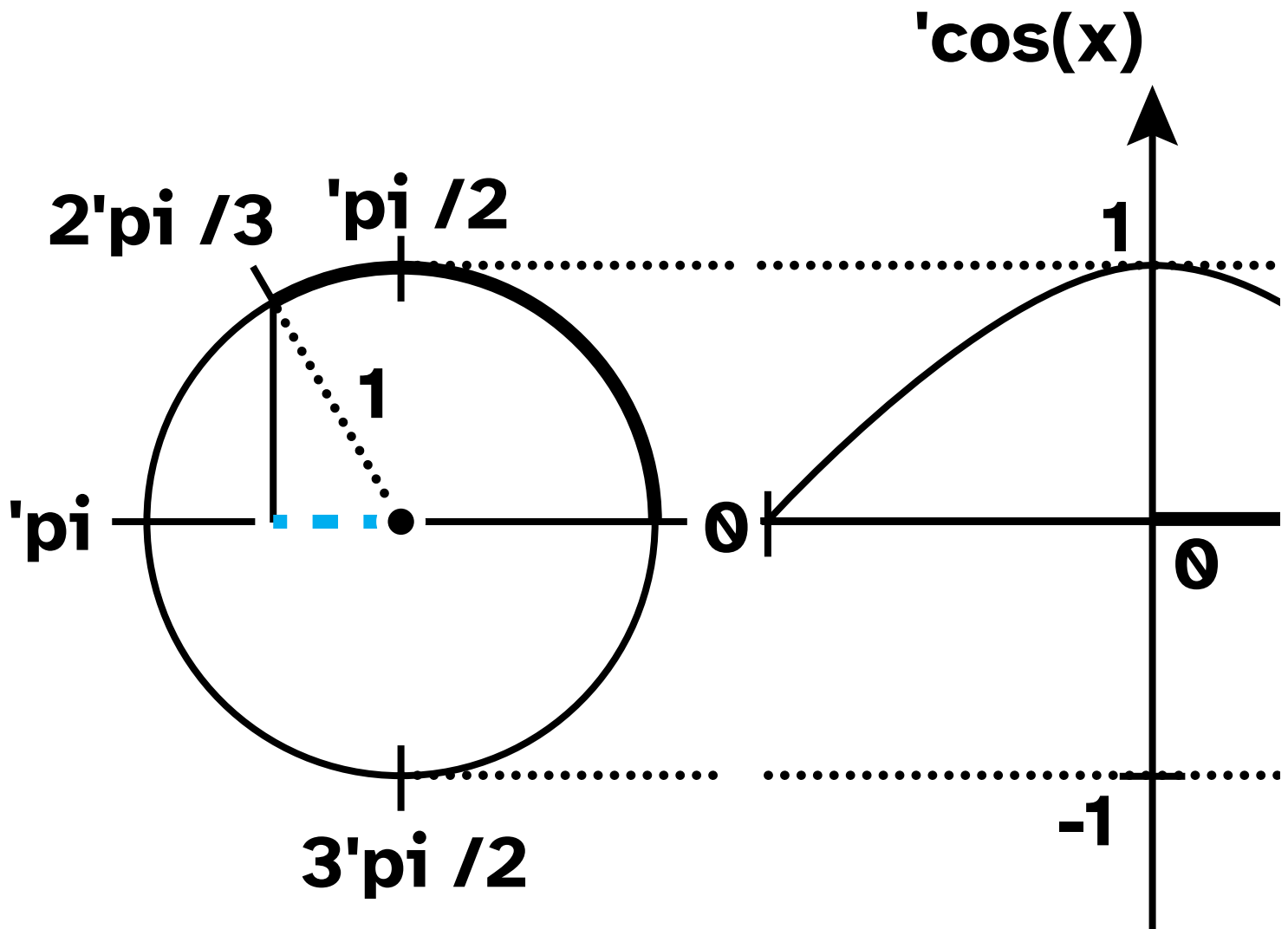
Sinusfunktion: $f(x) = \sin(x)$

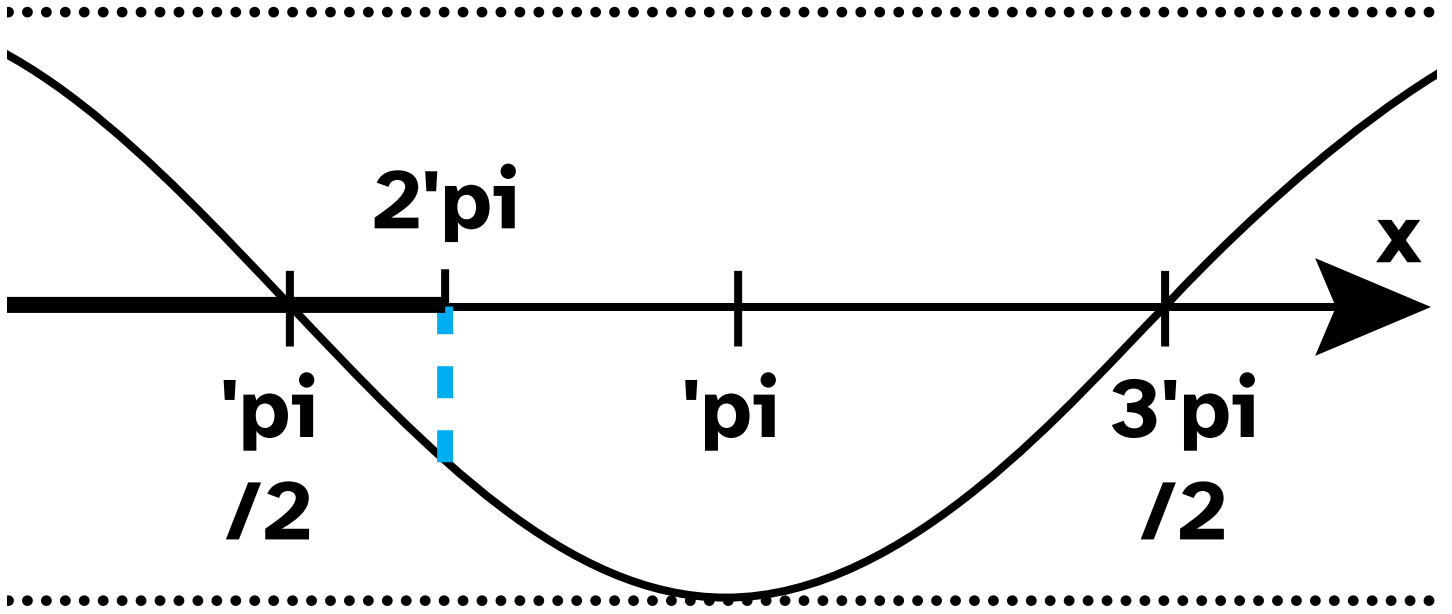


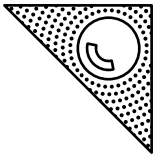




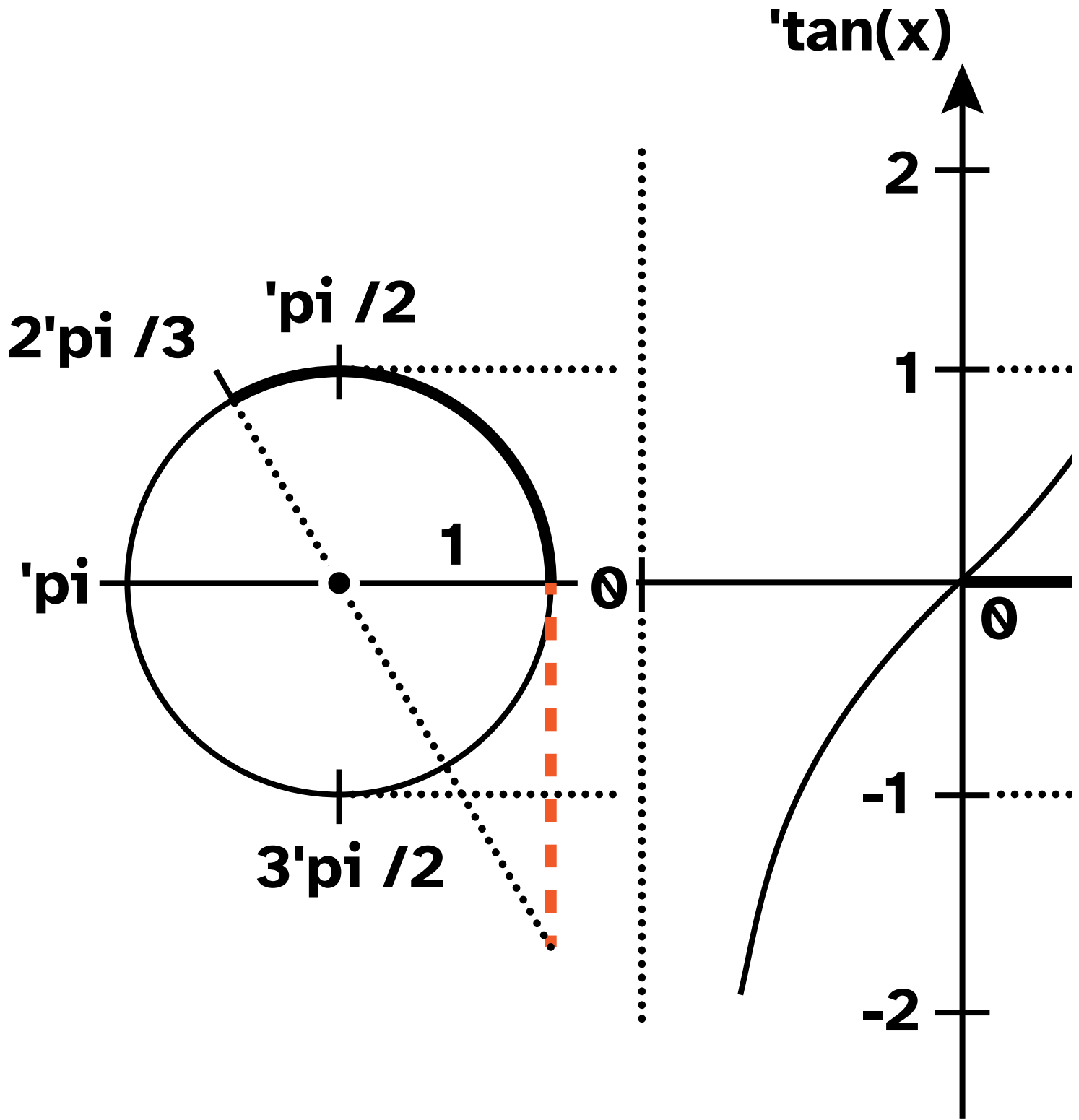
Cosinusfunktion: $f(x) = \cos(x)$

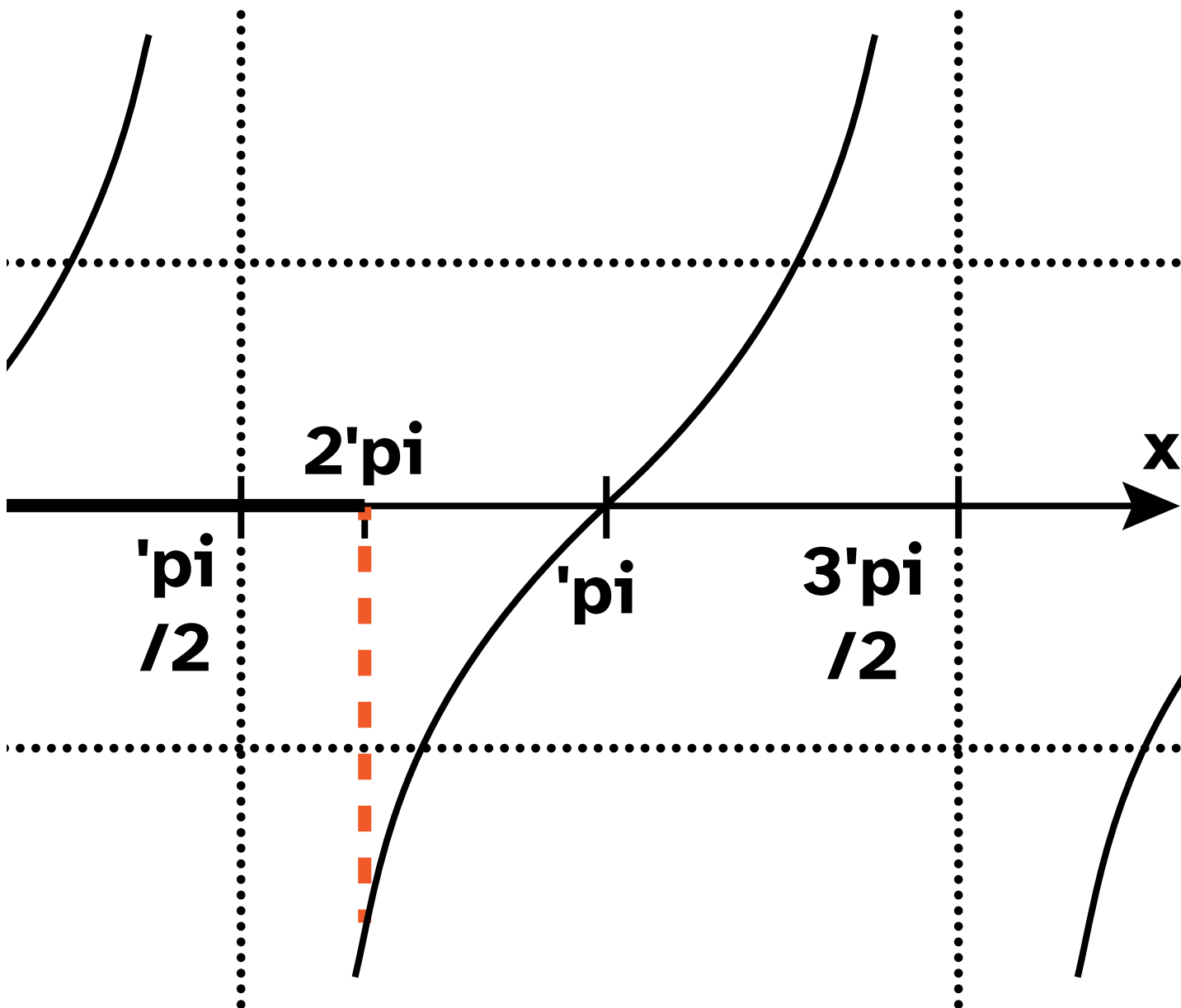


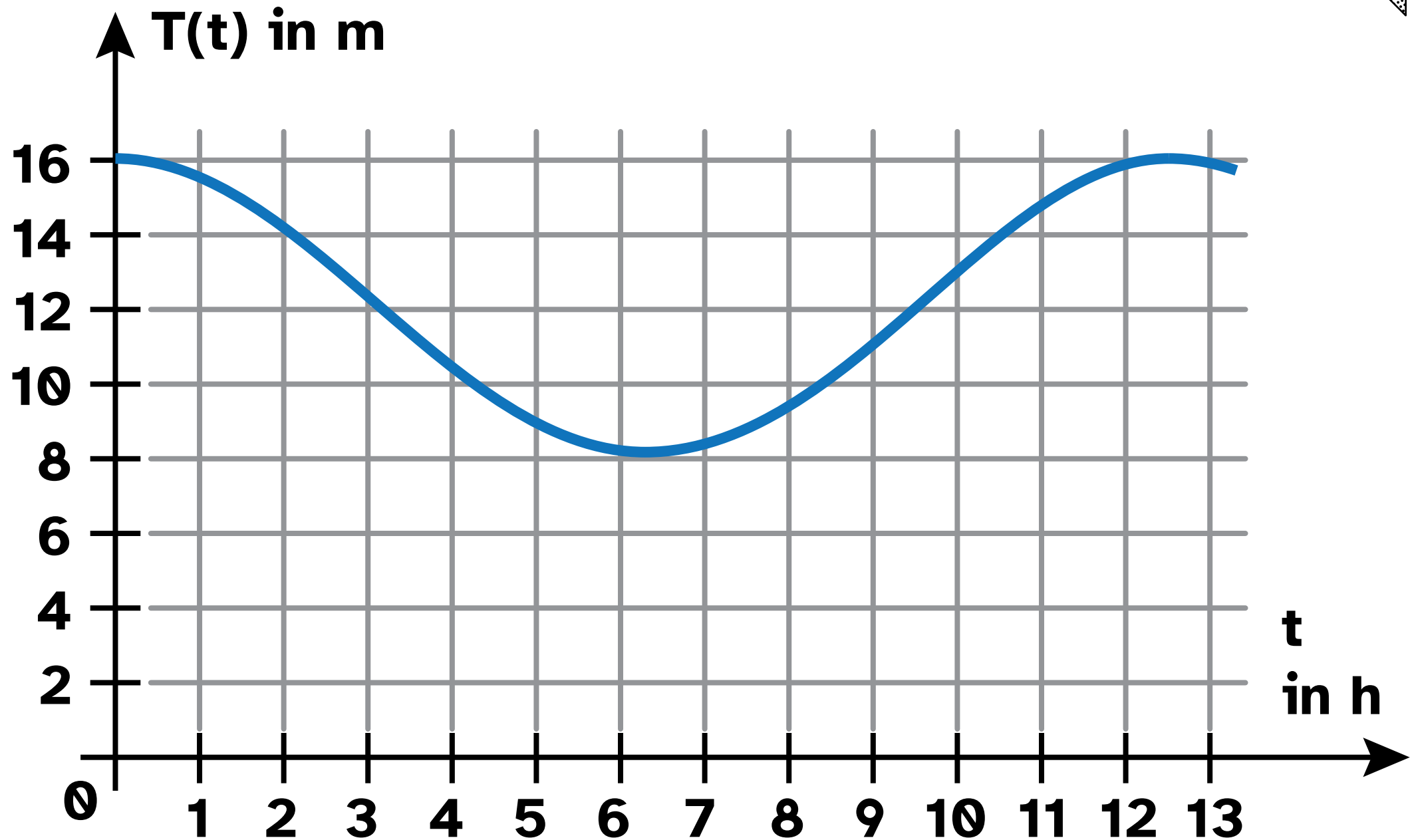
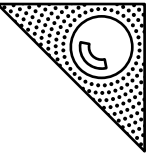


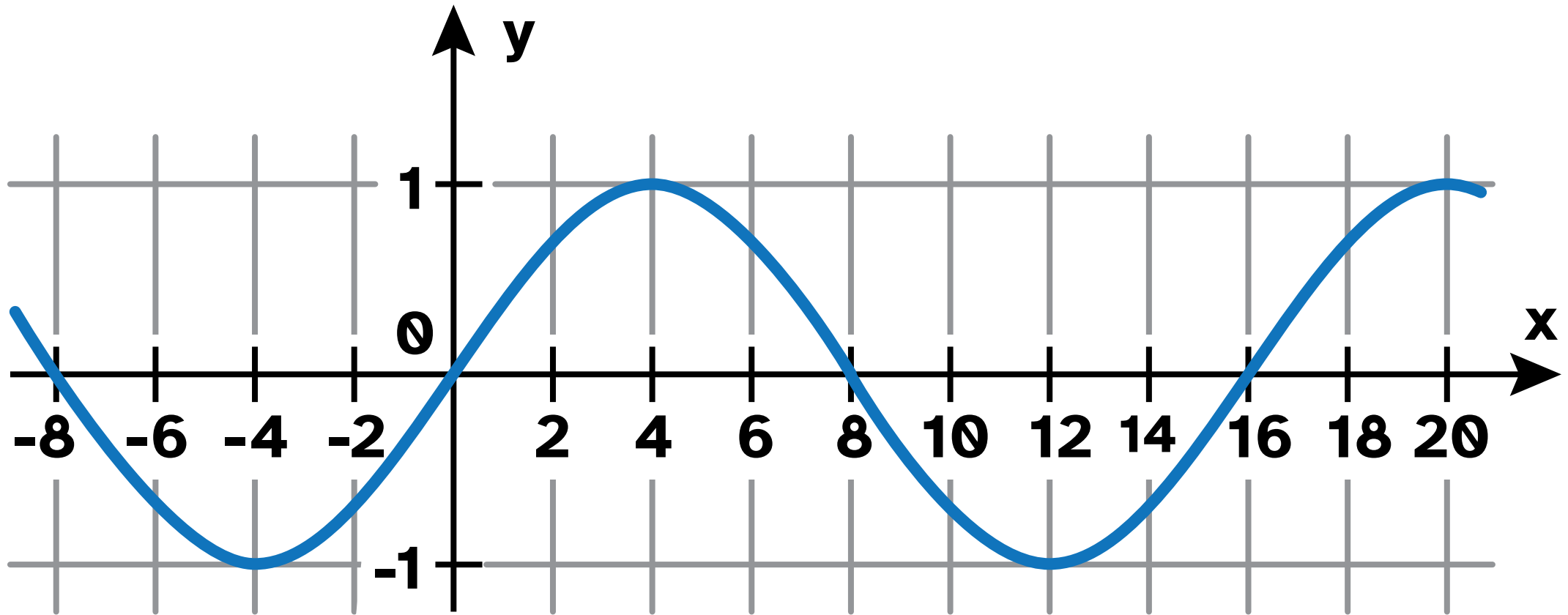
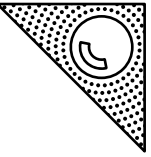


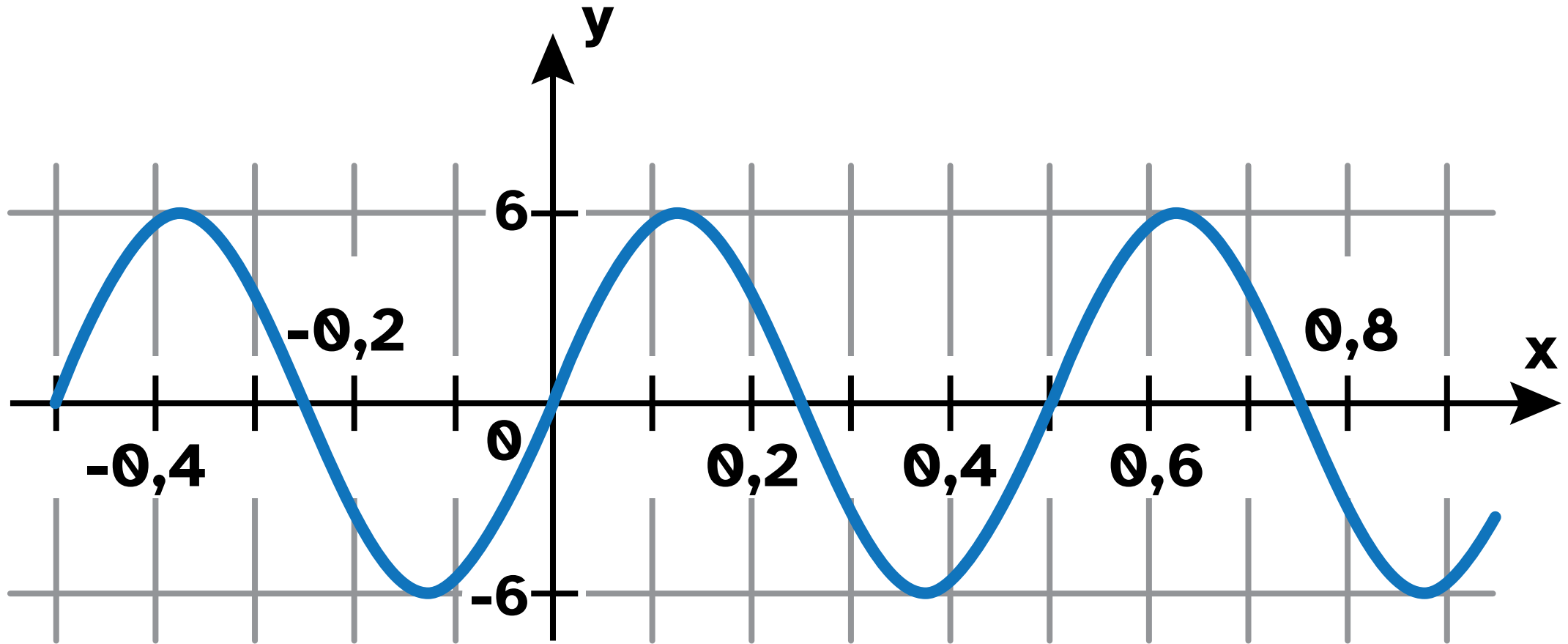
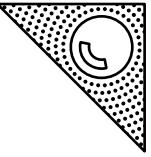
Tangensfunktion: $f(x) = \tan(x)$

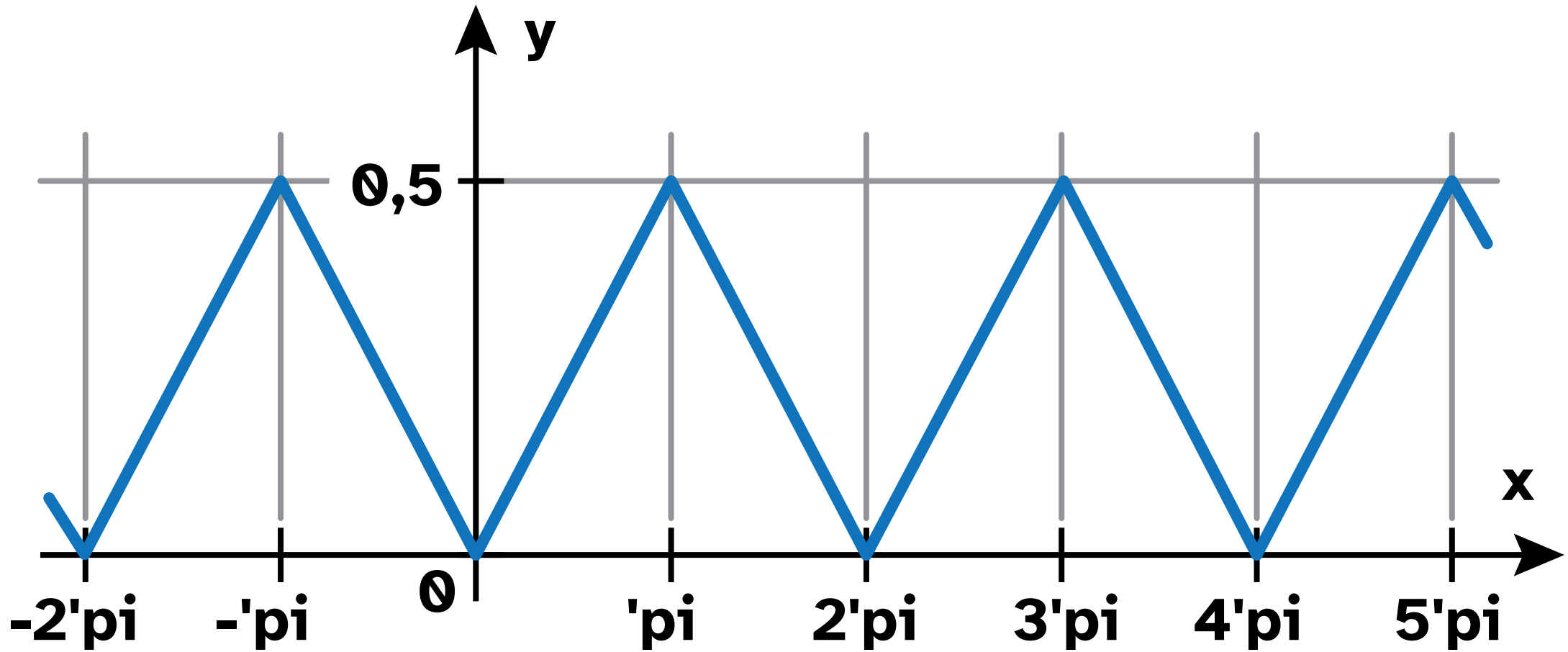
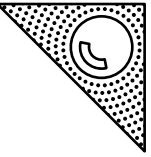


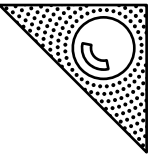




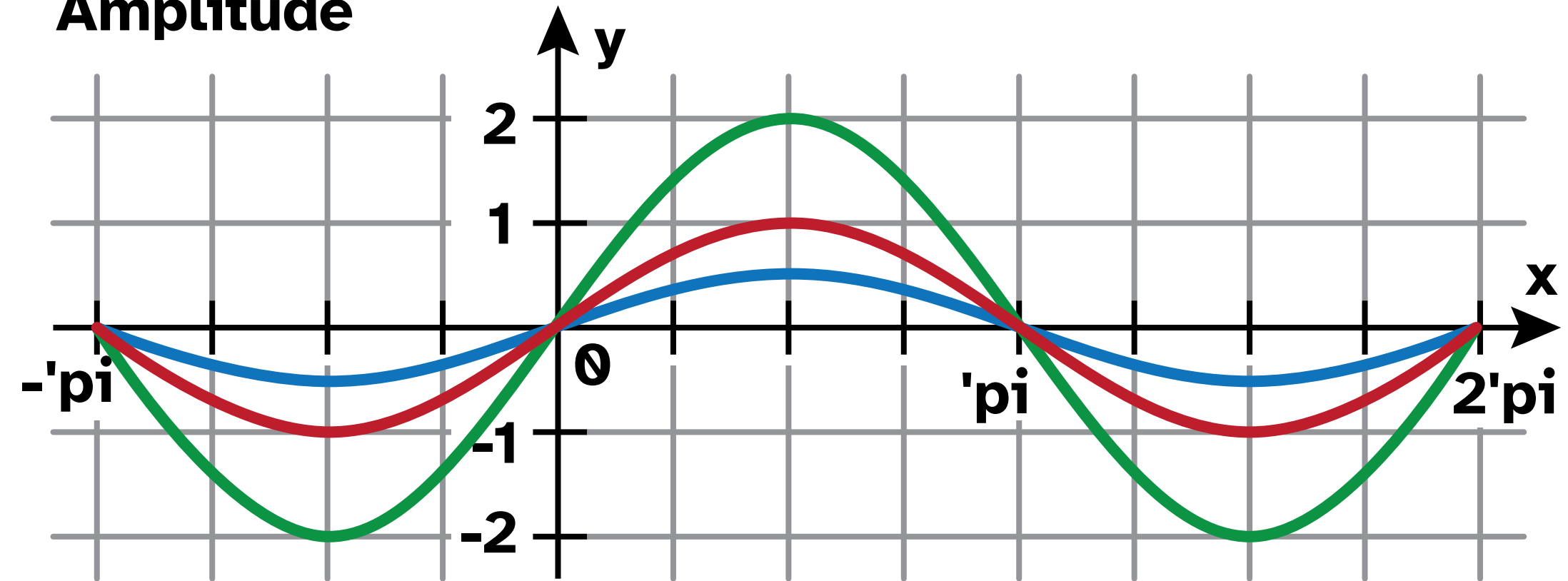








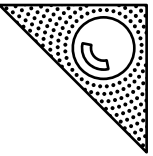
Amplitude



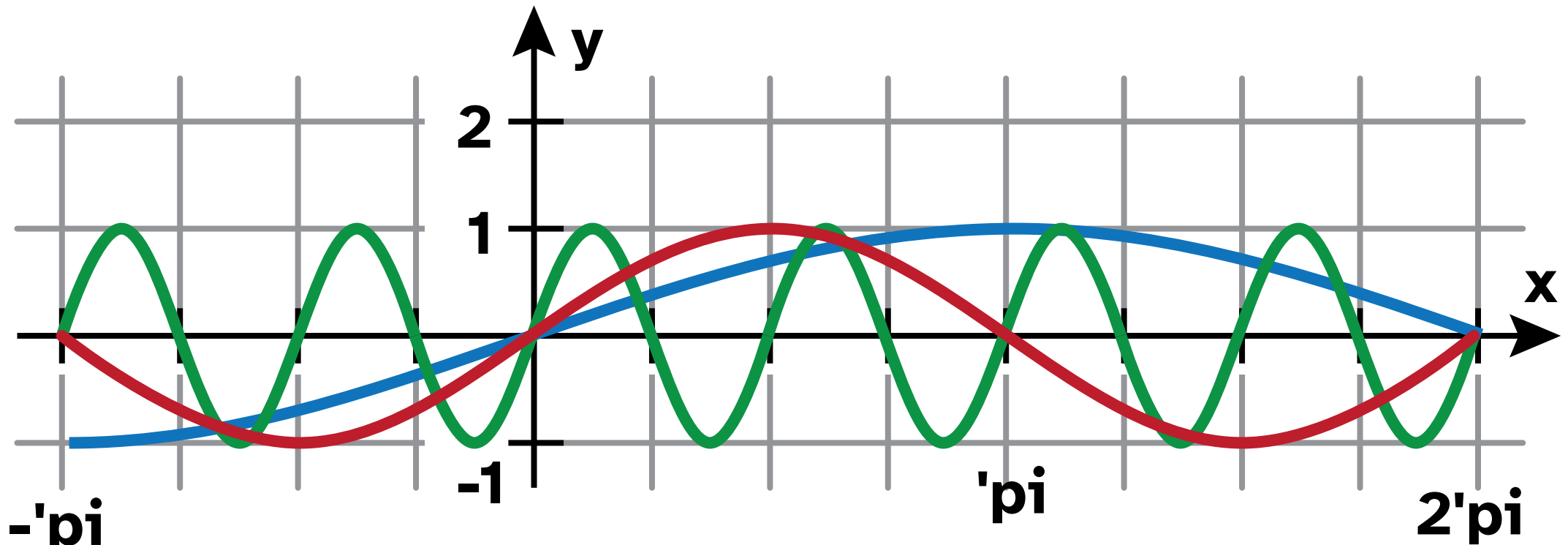
— $y = \sin(x), a = 1$

— $y = 2 \cdot \sin(x), a = 2$

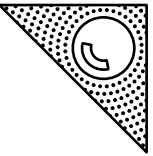
— $y = 0,5 \cdot \sin(x), a = 1/2$



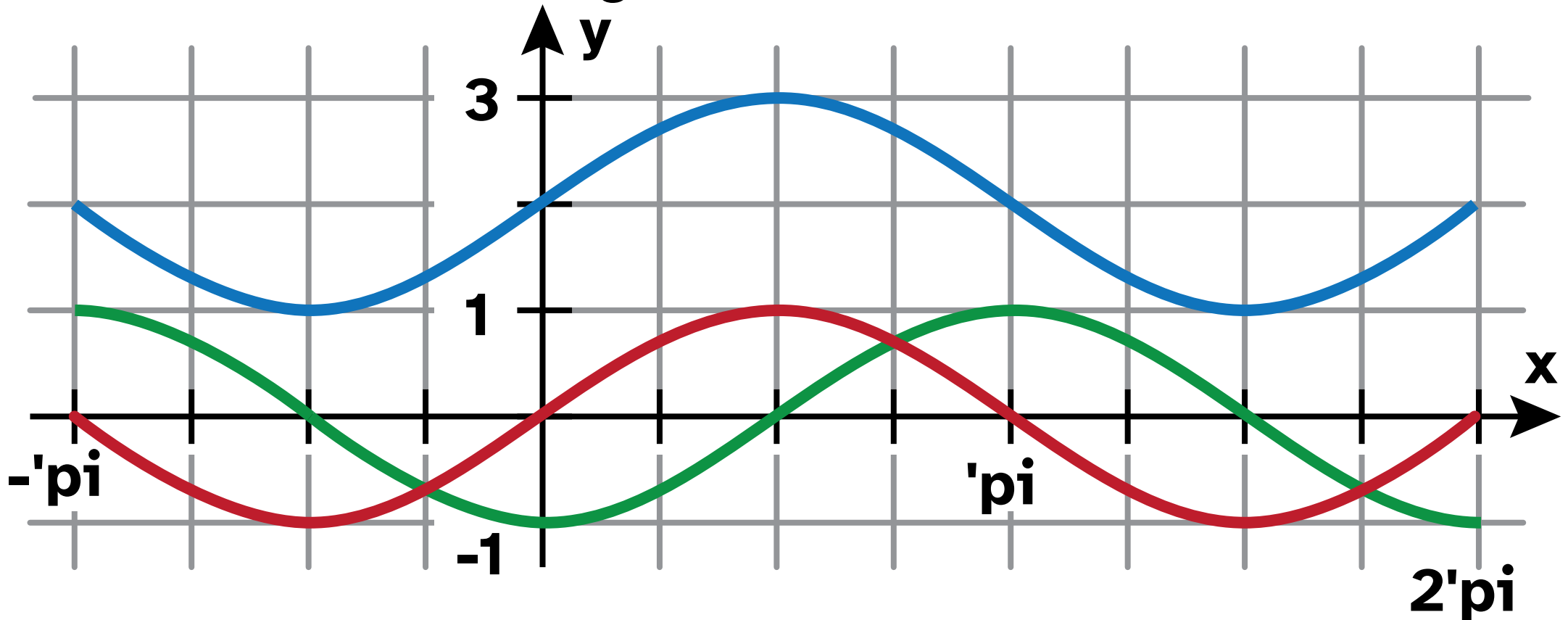
Frequenz



- $y = \sin(x), b = 1$
- $y = \sin(0,5x), b = 1/2$
- $y = \sin(4x), b = 4$



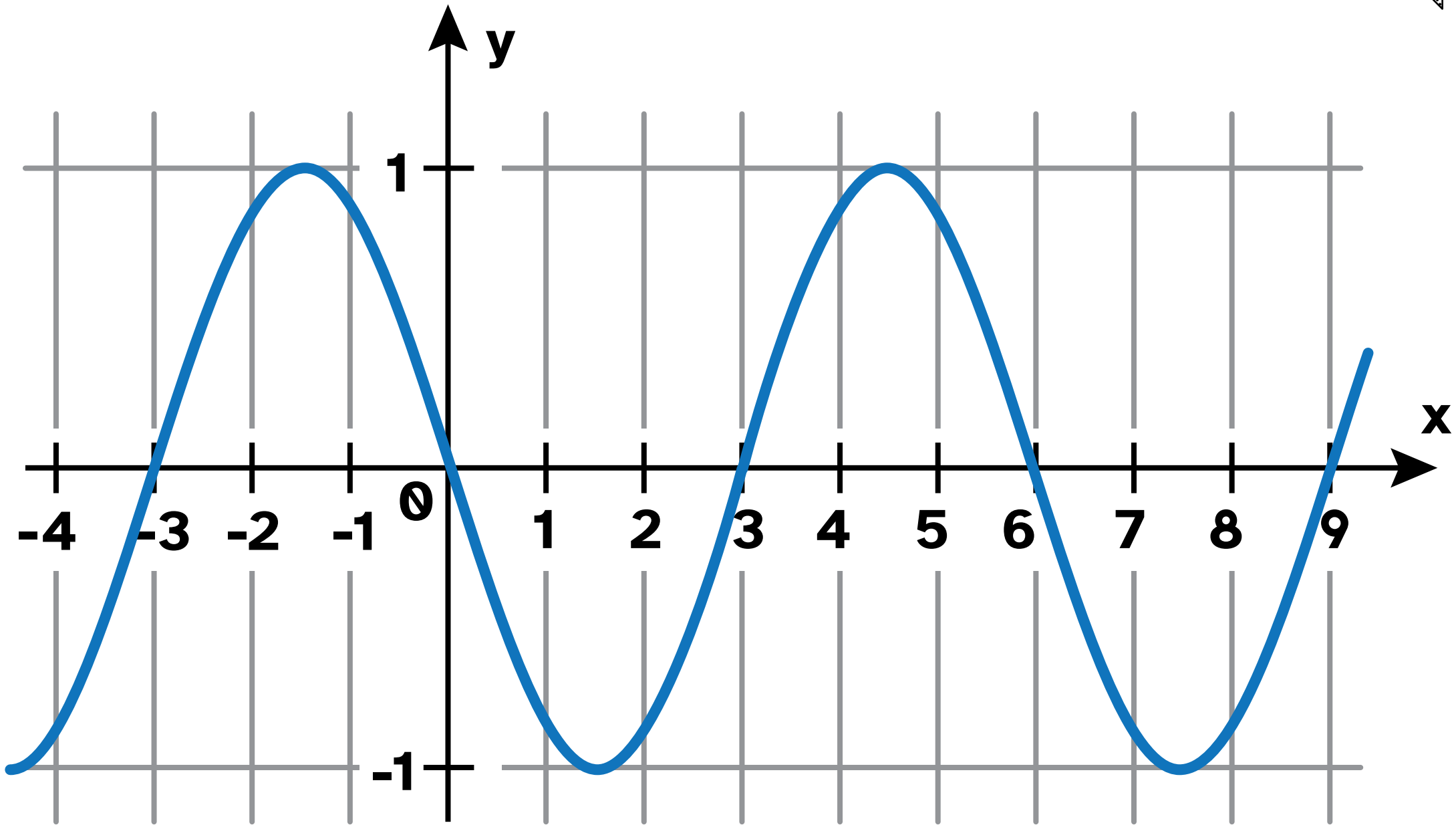
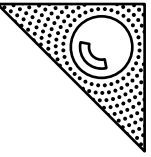
Phasenverschiebung

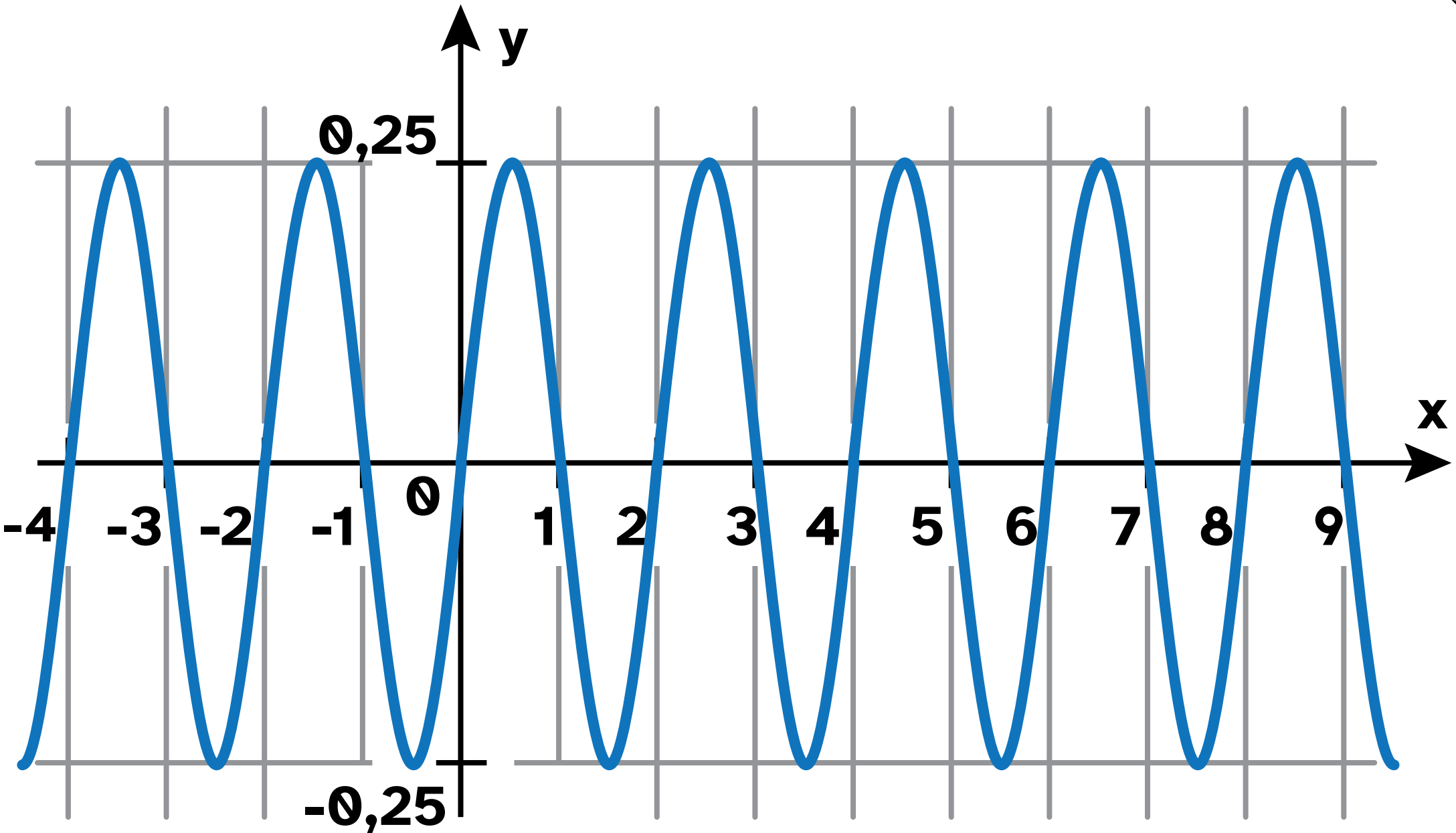
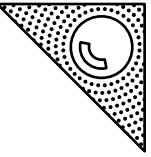


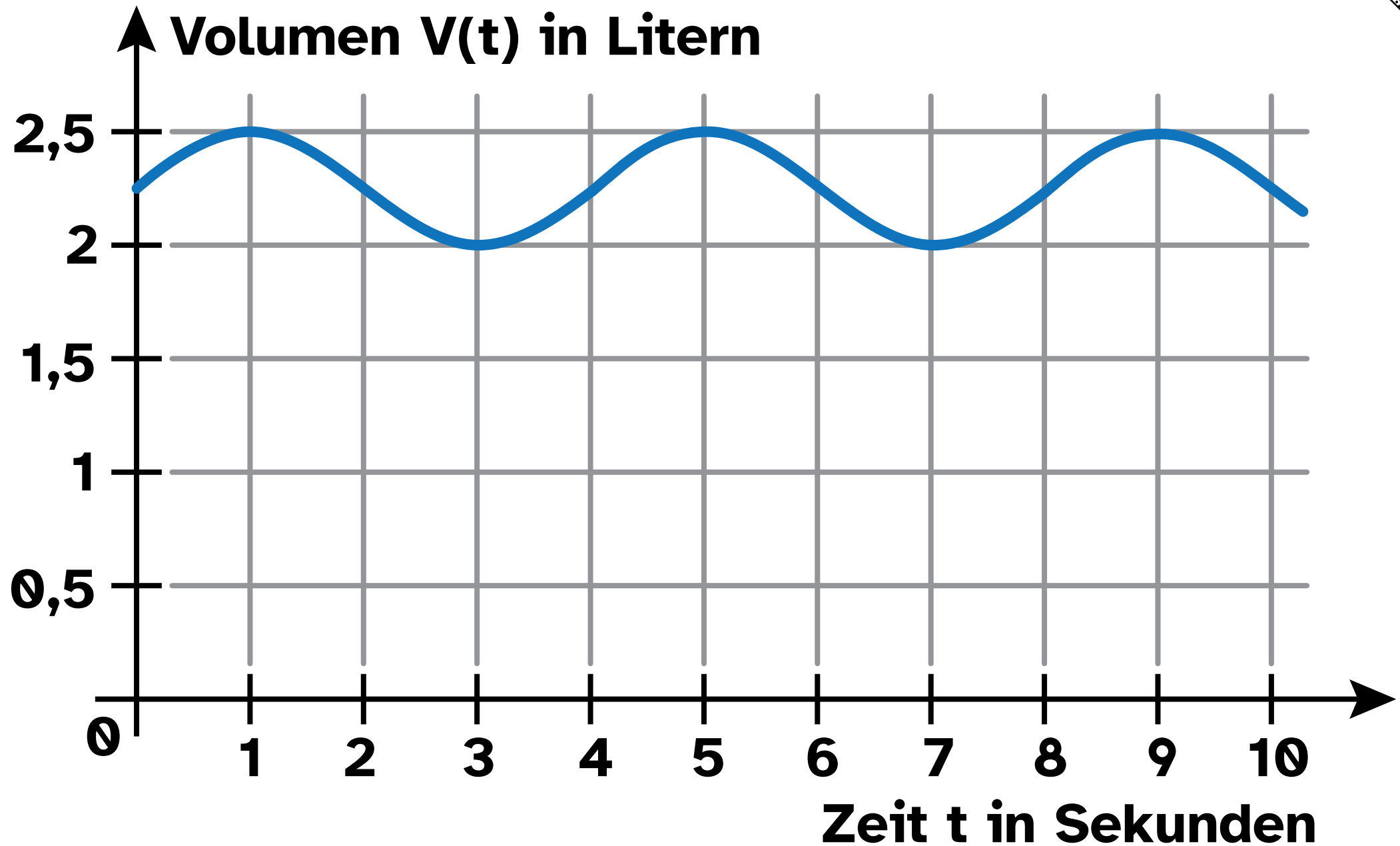
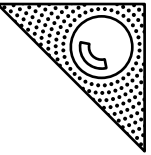
— $y = \sin(x), b = 1$

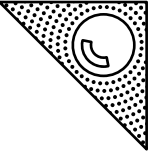
— $y = \sin(x) + 2, d = 2$

— $y = \sin(x - \pi/2), c = -\pi/2$

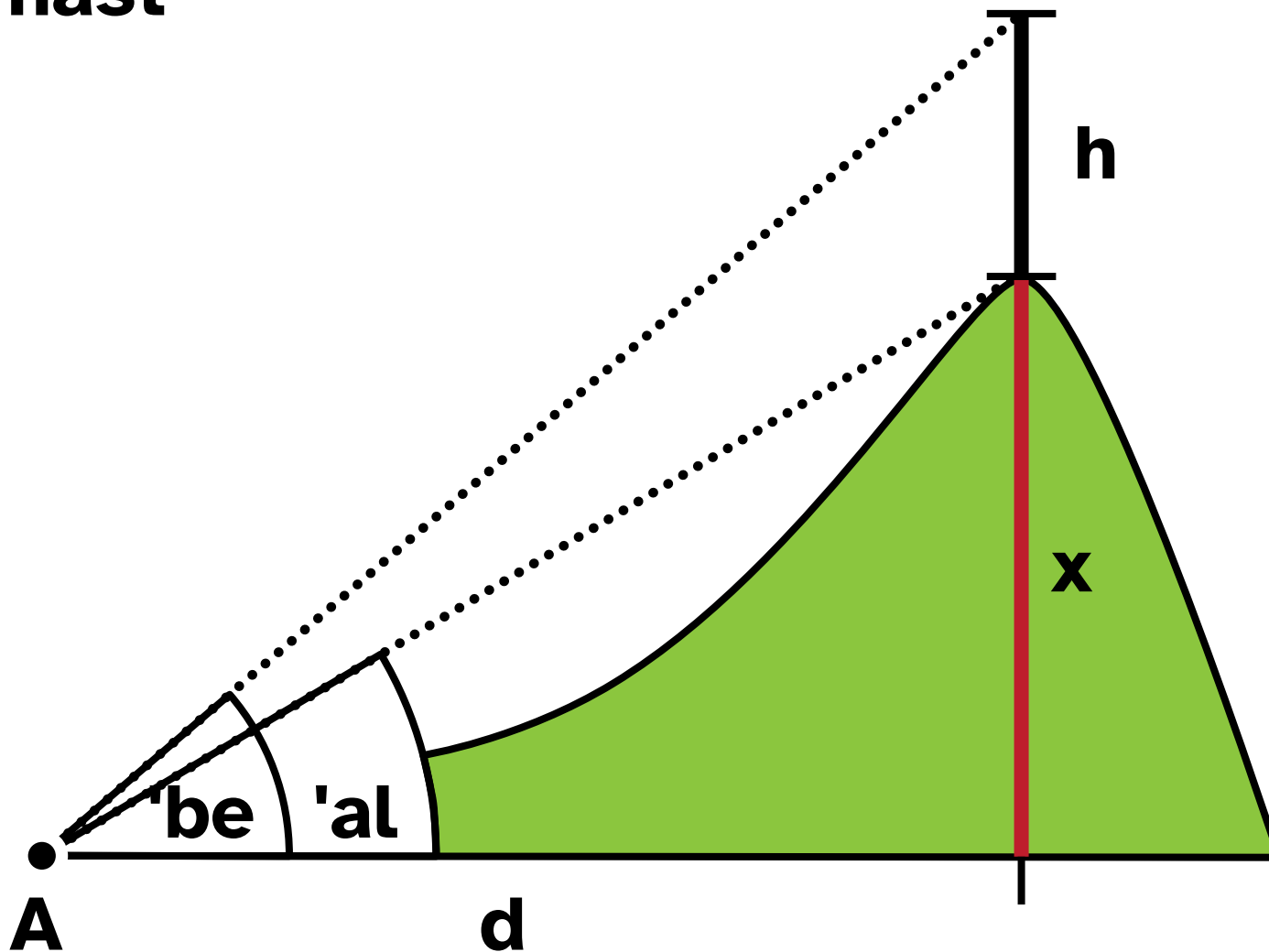


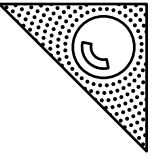




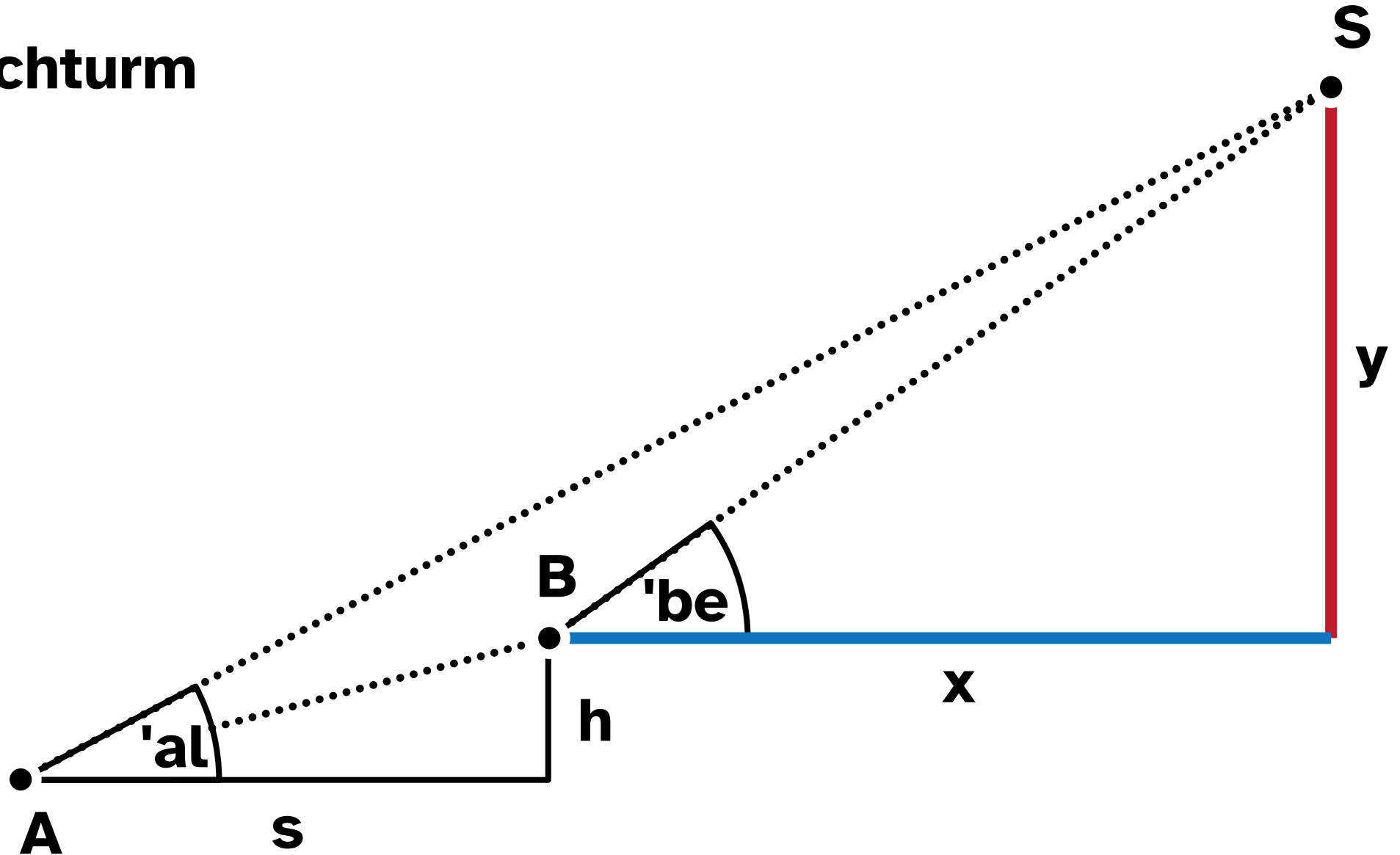


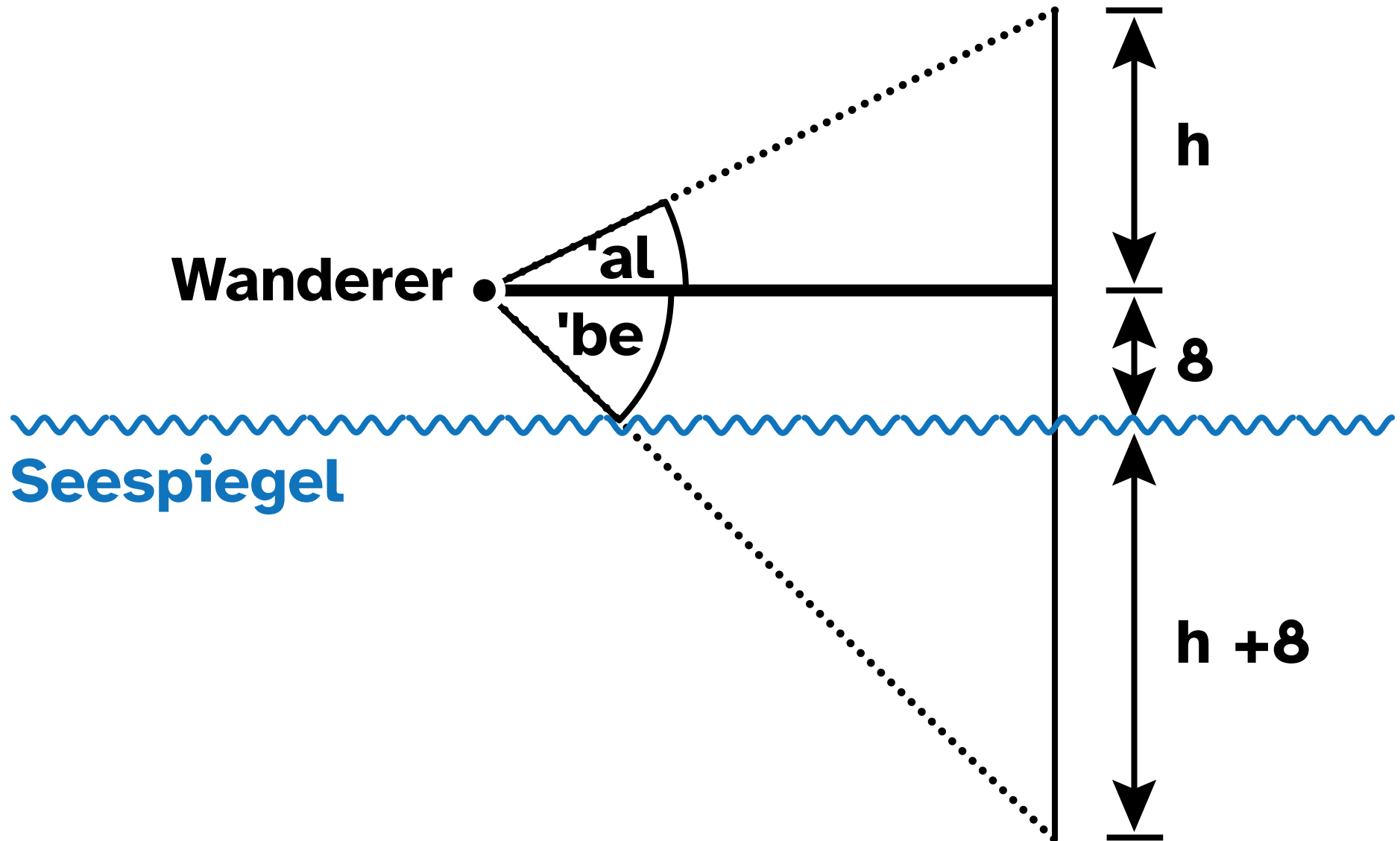
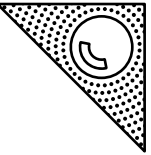
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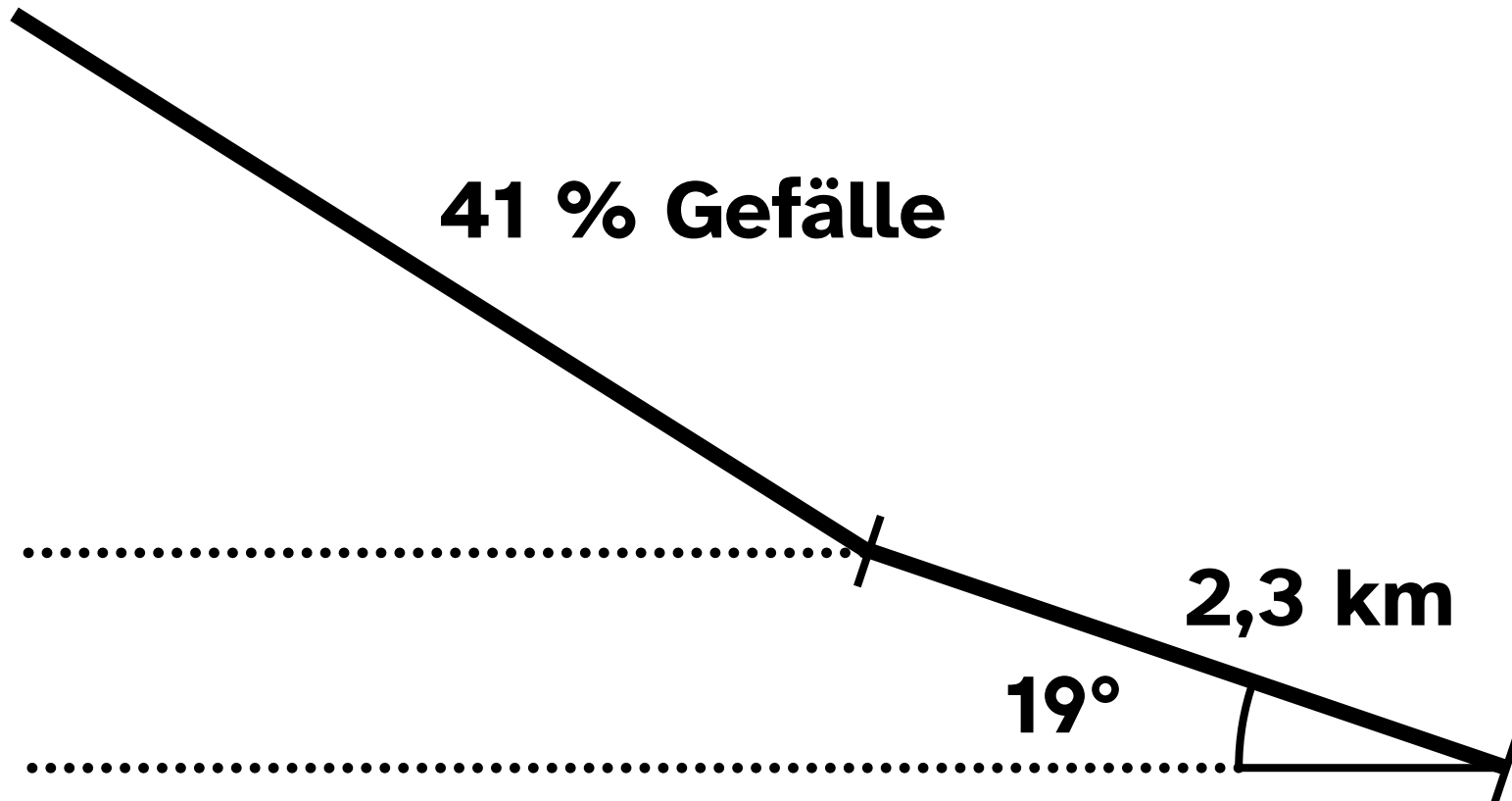
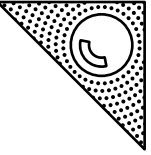


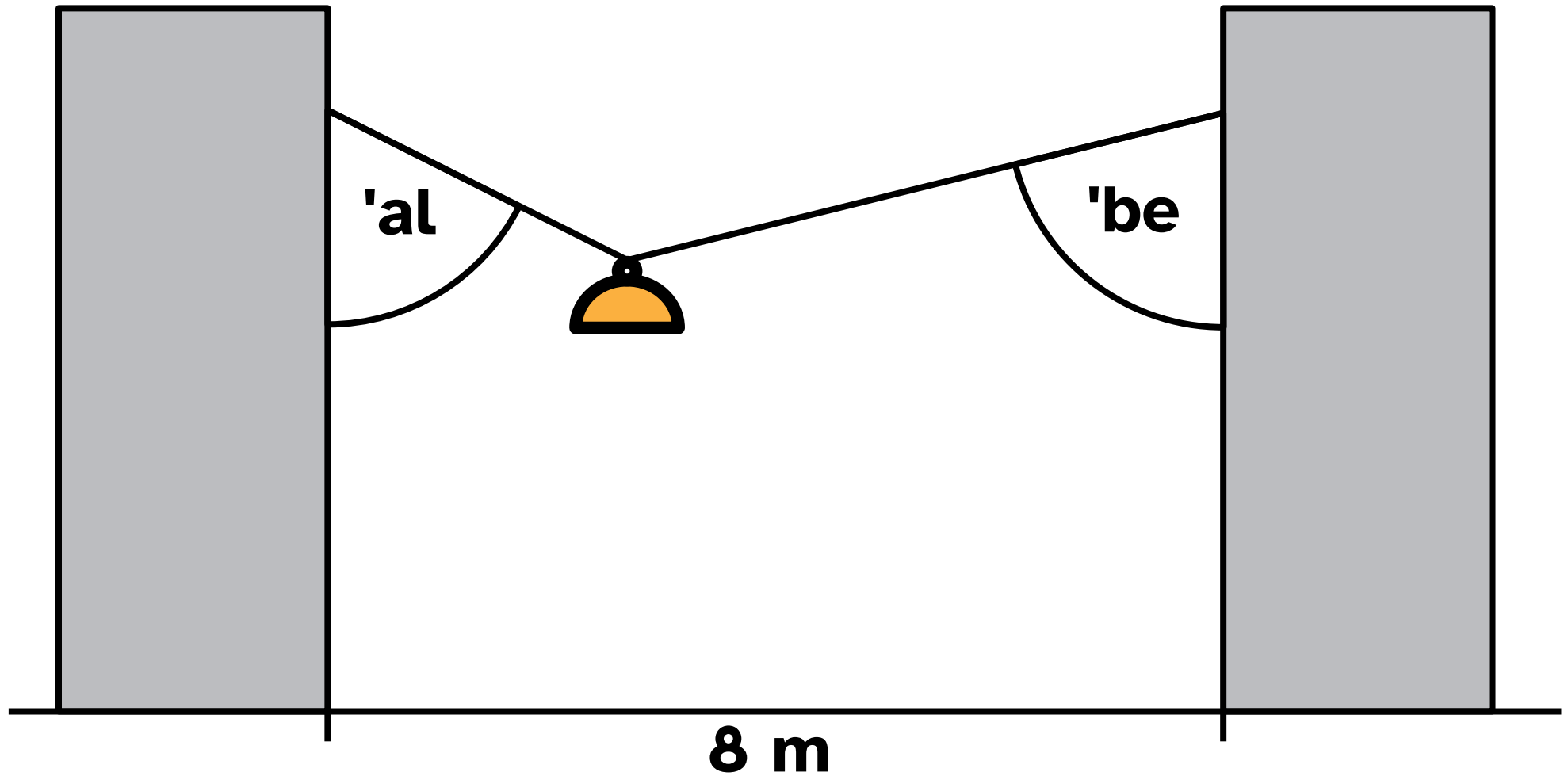
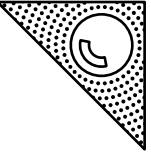


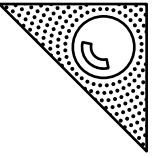
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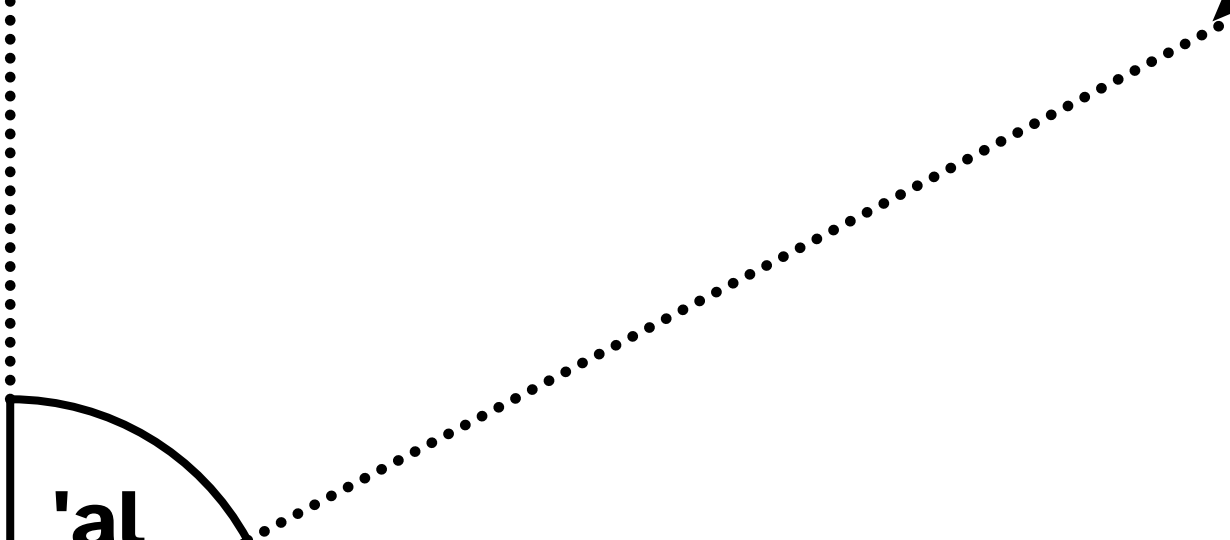
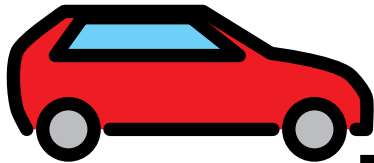




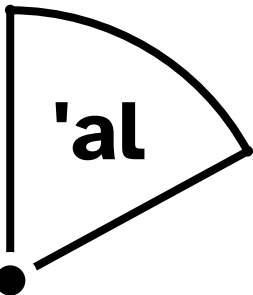


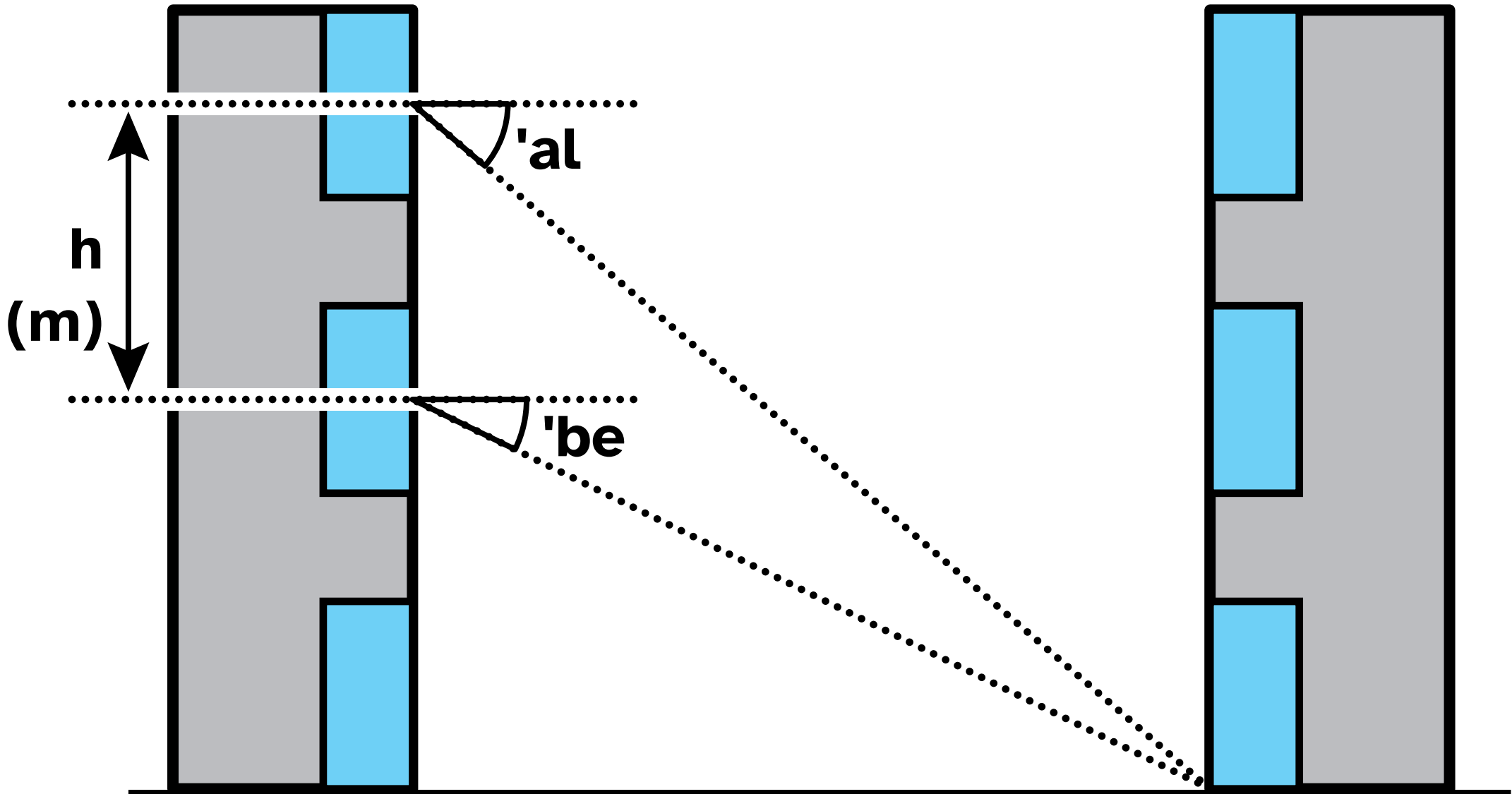
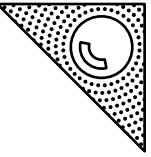


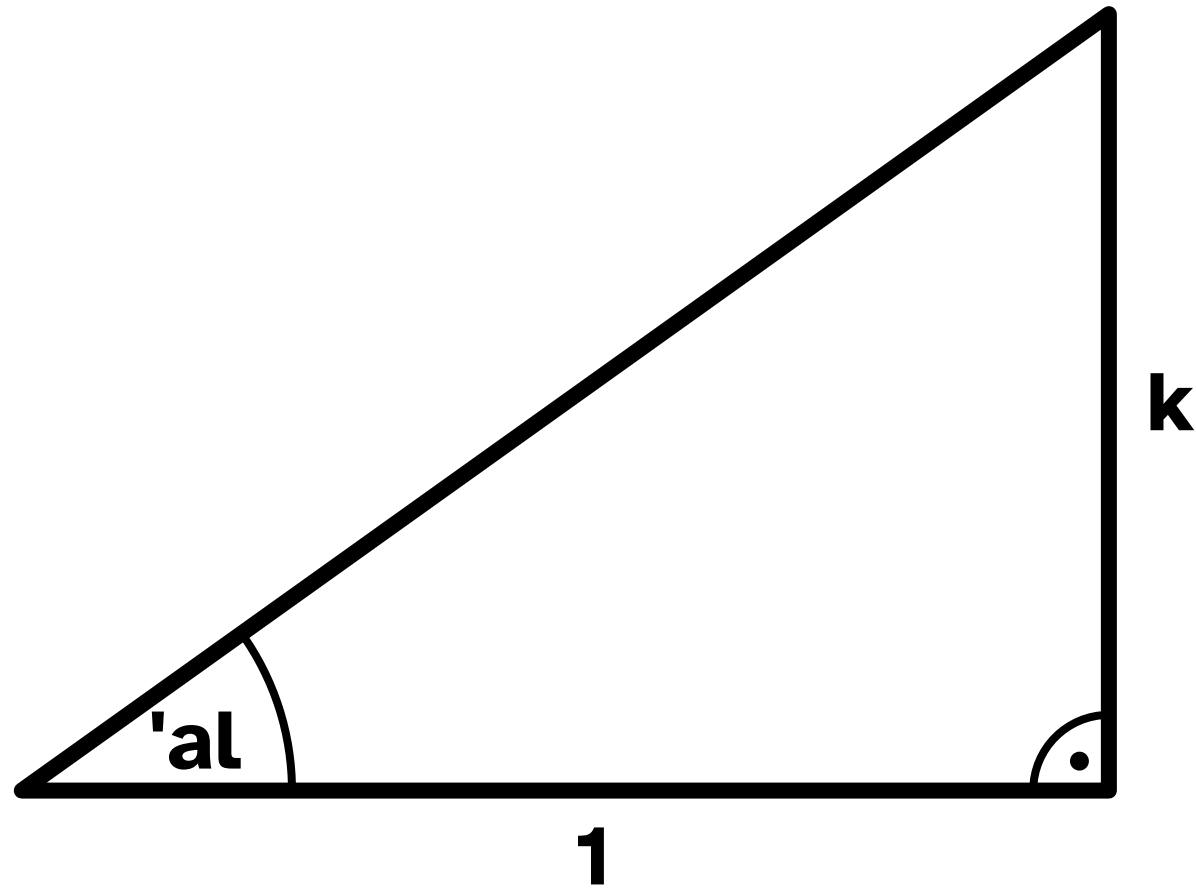
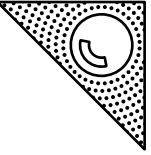
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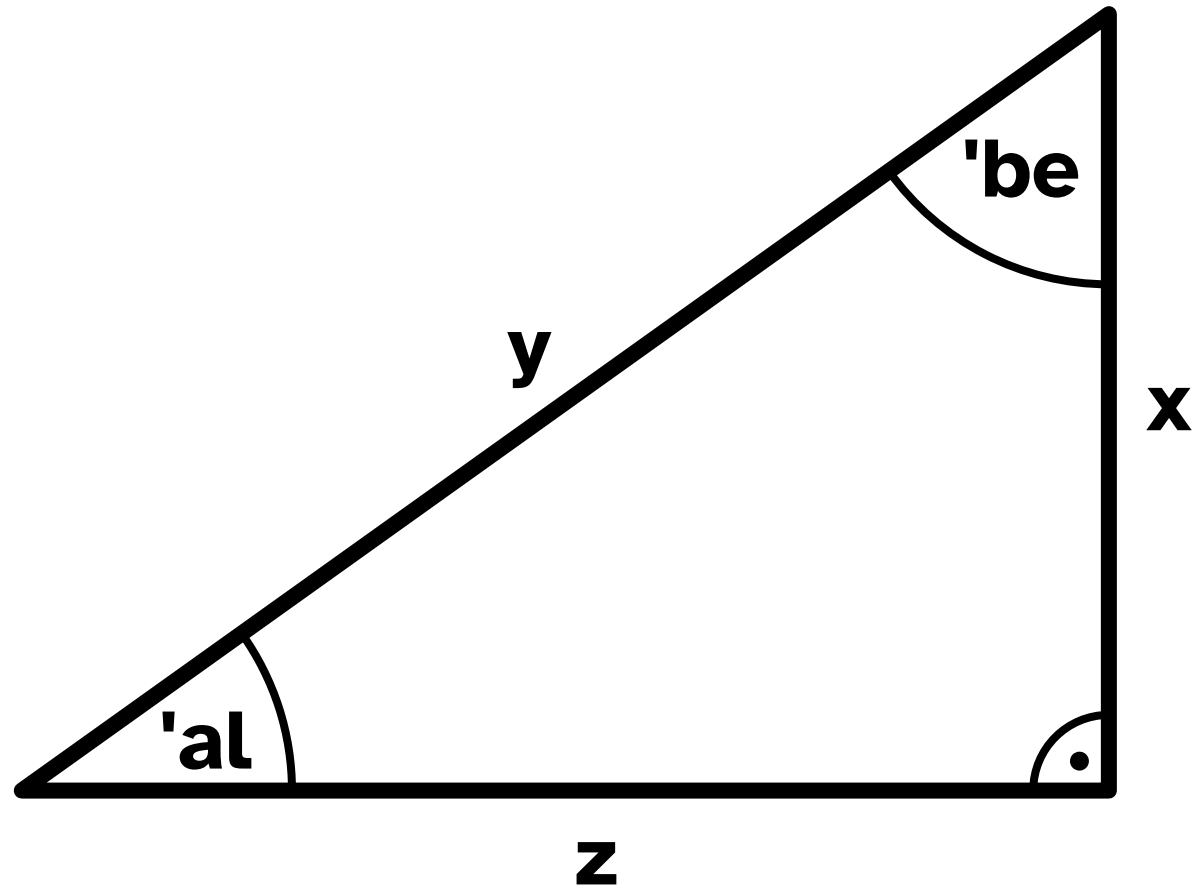
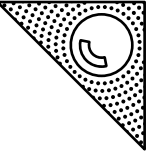


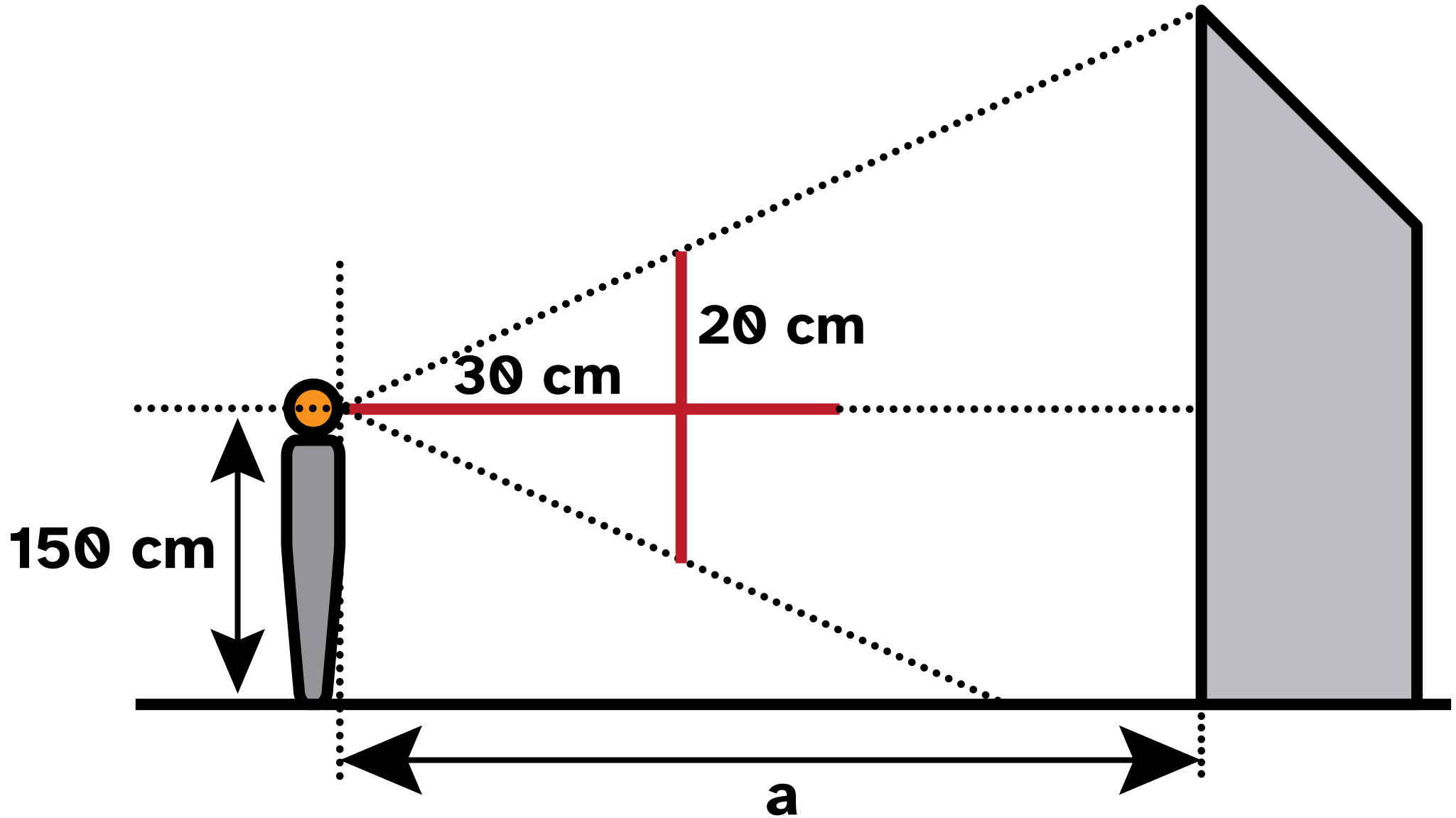
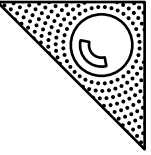
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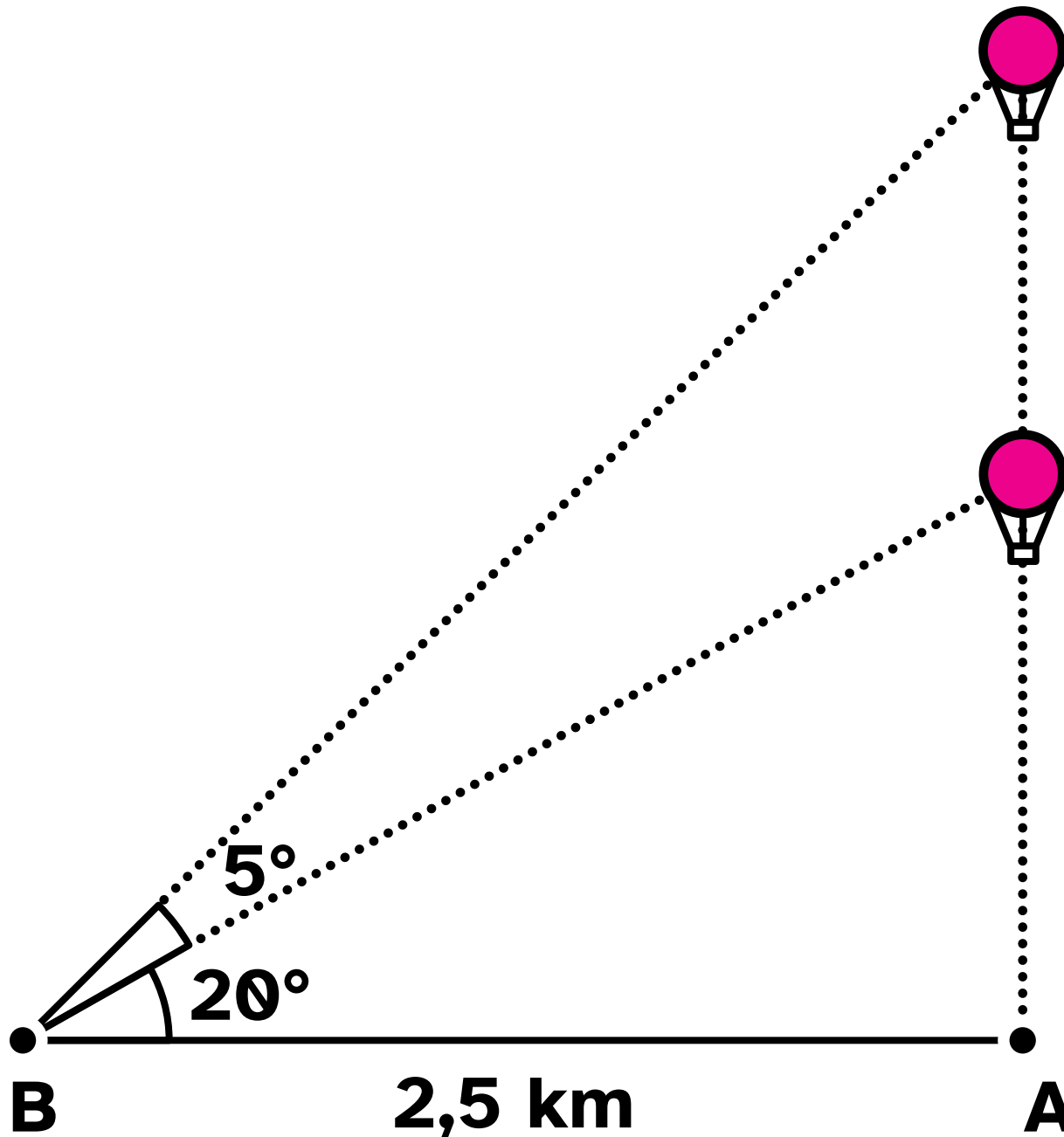
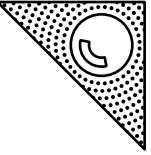


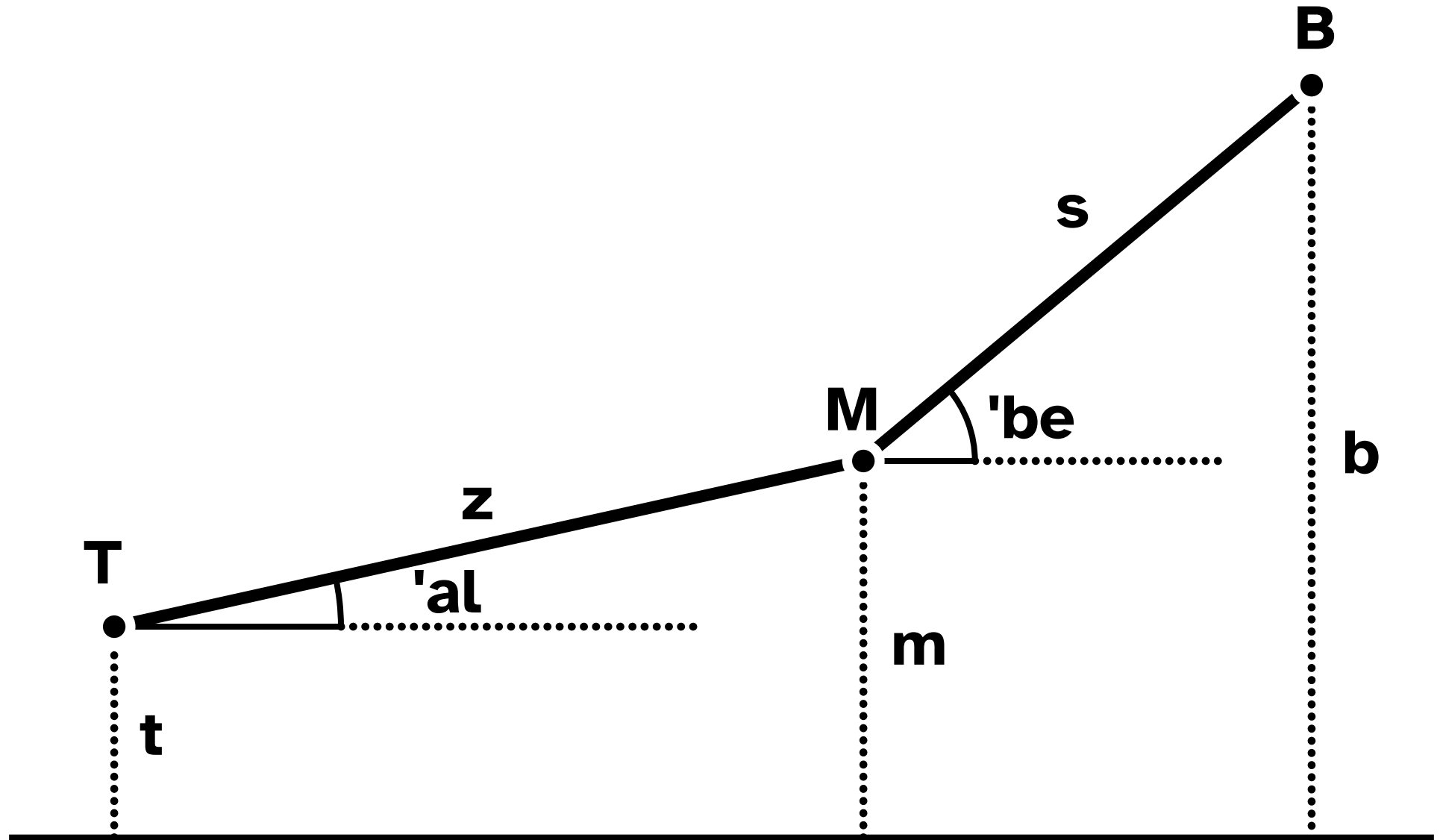
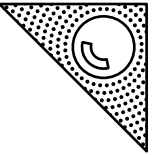












Skizze nicht maßstabgetreu

