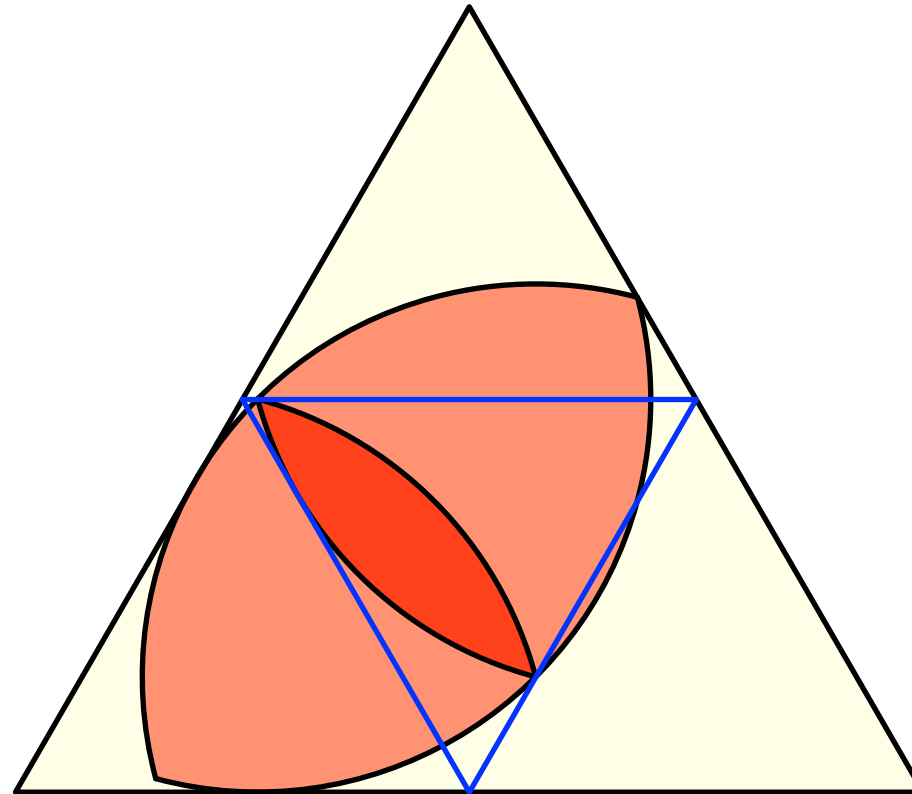


Hans Walser

Reuleaux-Zweiecke



[www.walser-h-m.ch/hans](http://www.walser-h-m.ch/hans)

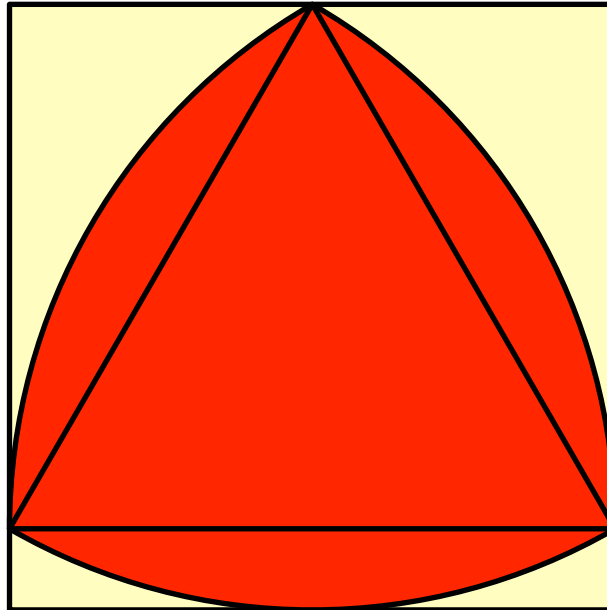
Hans Walser

Reuleaux-Zweiecke

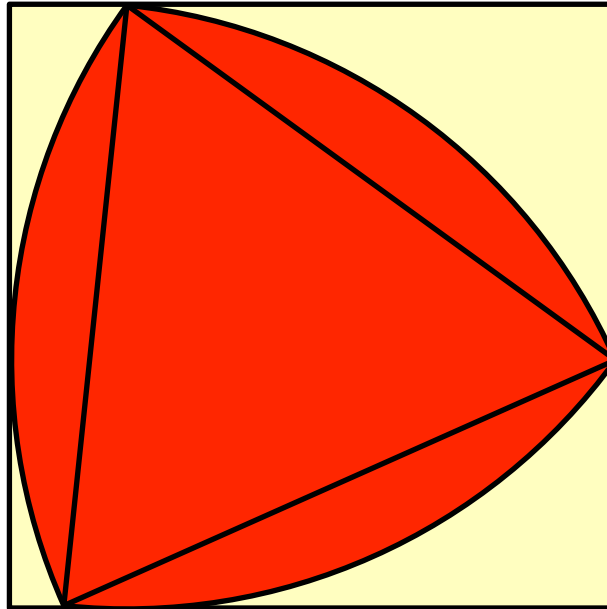
- Kinematische Geometrie
- Visuelles Beweisen
- Referenzsysteme

[www.walser-h-m.ch/hans](http://www.walser-h-m.ch/hans)

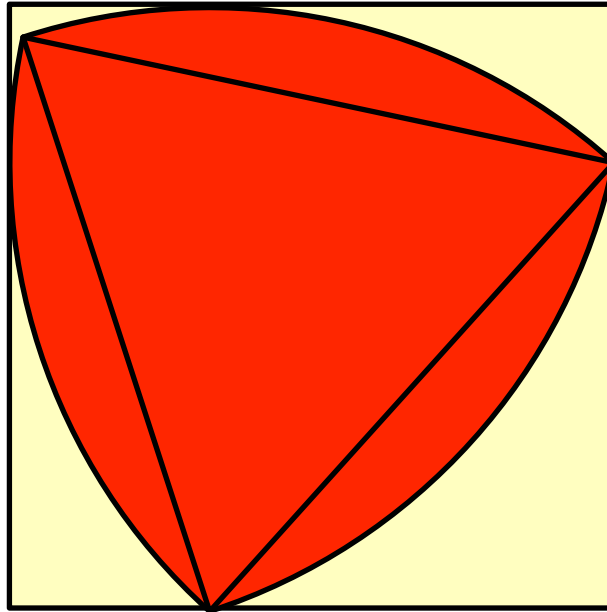
Ein alter Bekannter: Reuleaux-Dreieck



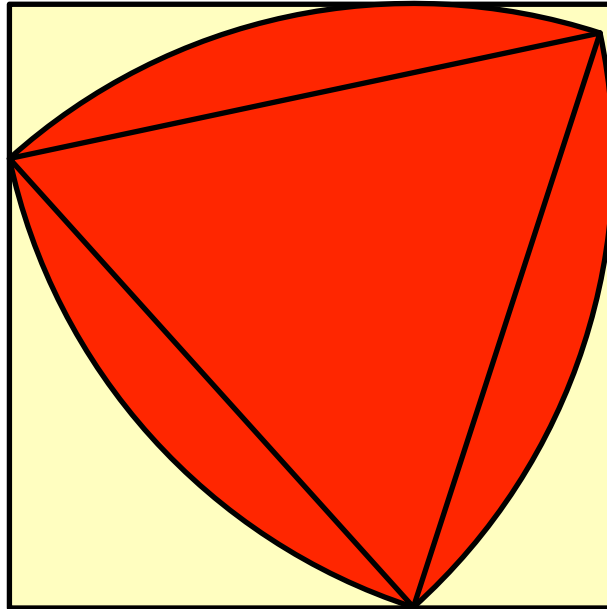
Ein alter Bekannter: Reuleaux-Dreieck



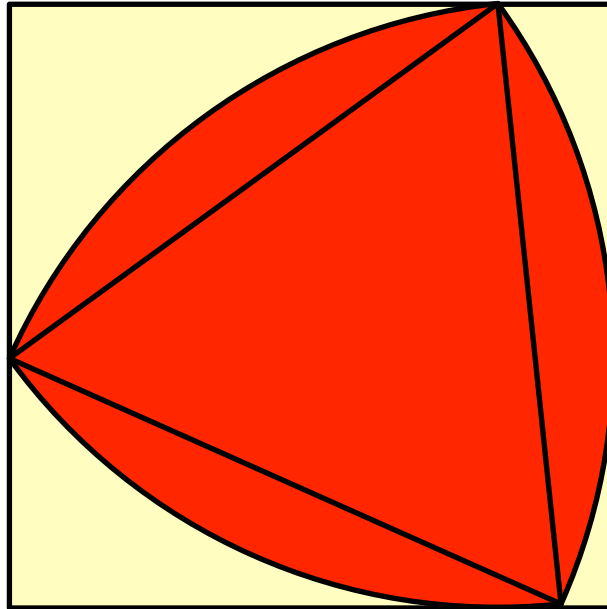
Ein alter Bekannter: Reuleaux-Dreieck



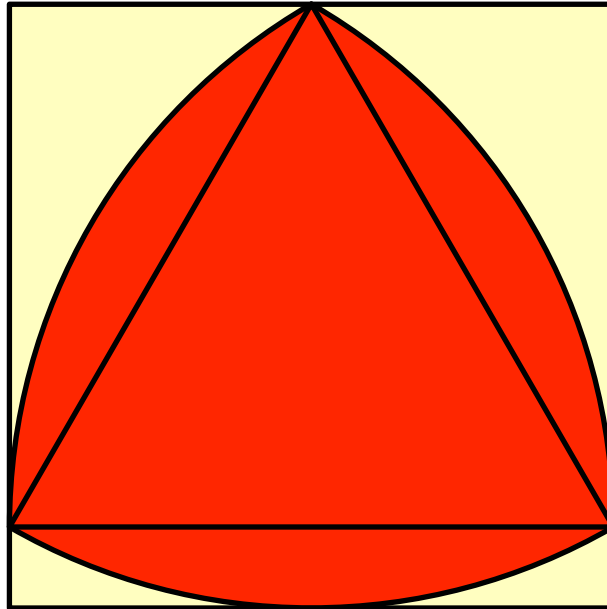
Ein alter Bekannter: Reuleaux-Dreieck



Ein alter Bekannter: Reuleaux-Dreieck

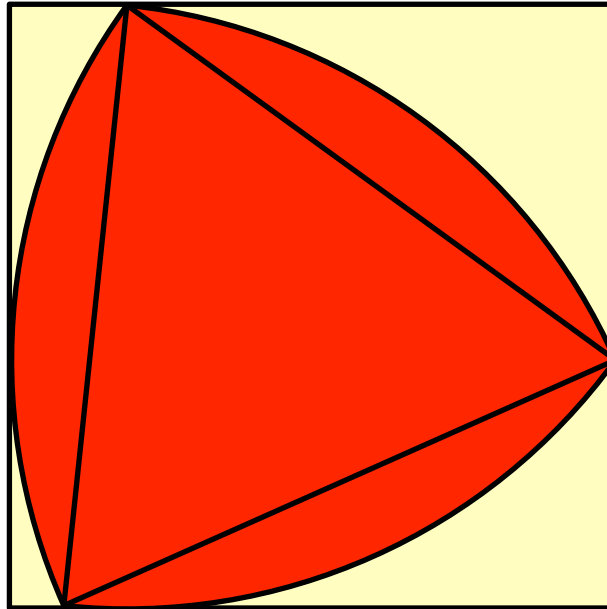


Ein alter Bekannter: Reuleaux-Dreieck

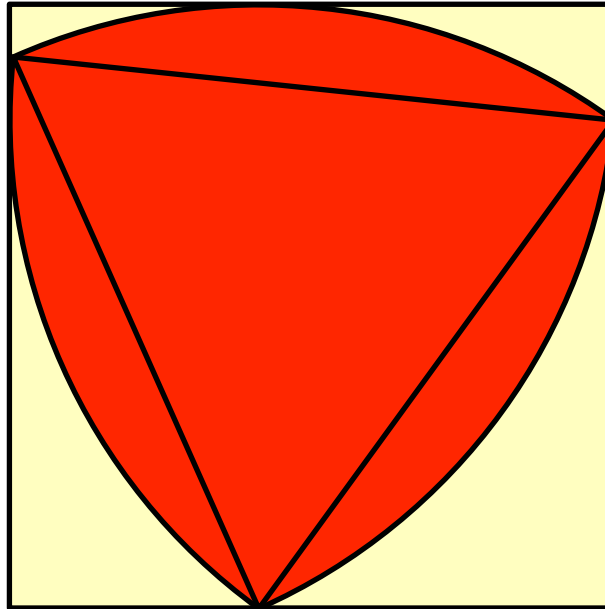




Ein alter Bekannter: Reuleaux-Dreieck



Ein alter Bekannter: Reuleaux-Dreieck



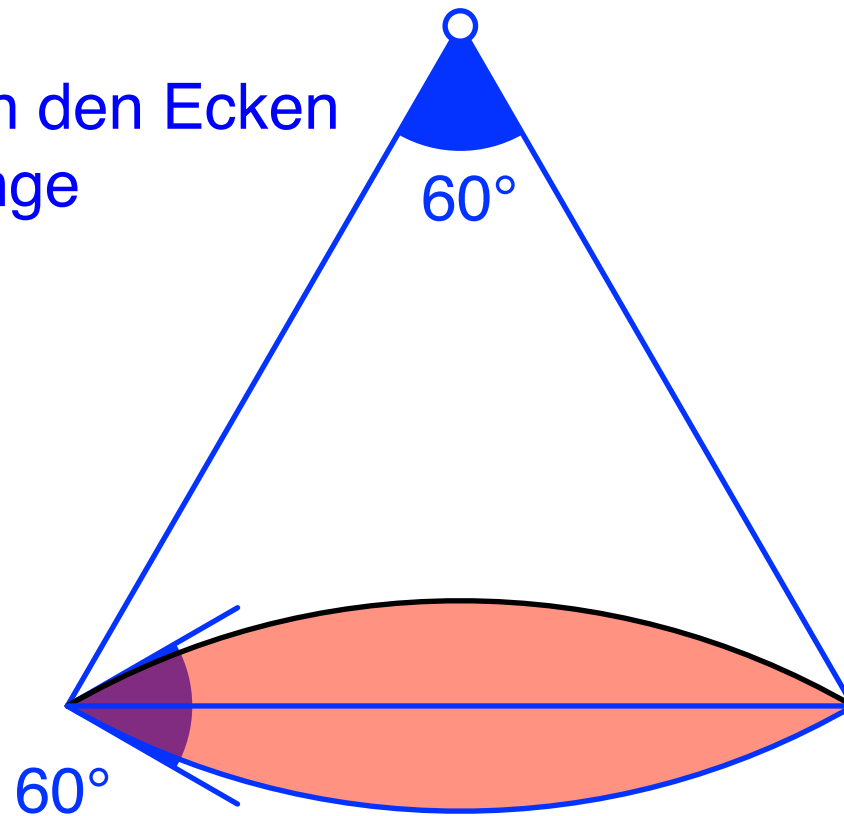
# Franz Reuleaux

- \*1829 Eschweiler-Pumpe
- 1850-52 Studium Polytechnische Hochschule Karlsruhe
- 1852-54 Studium Universitäten Berlin und Bonn
- 1856-64 Eidg. Polytechnikum Zürich (ETH Zürich)
- 1864-96 Königl. Gewerbe-Institut Berlin (TU Berlin)
- +1905

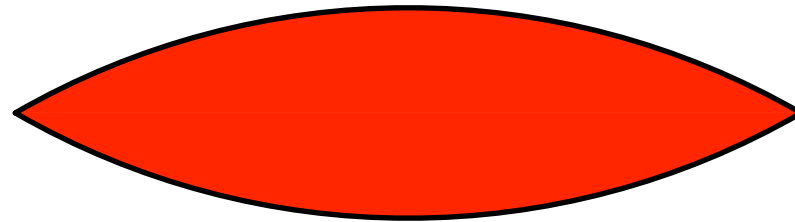
# Reuleaux-Zweieck

60°-Winkel:

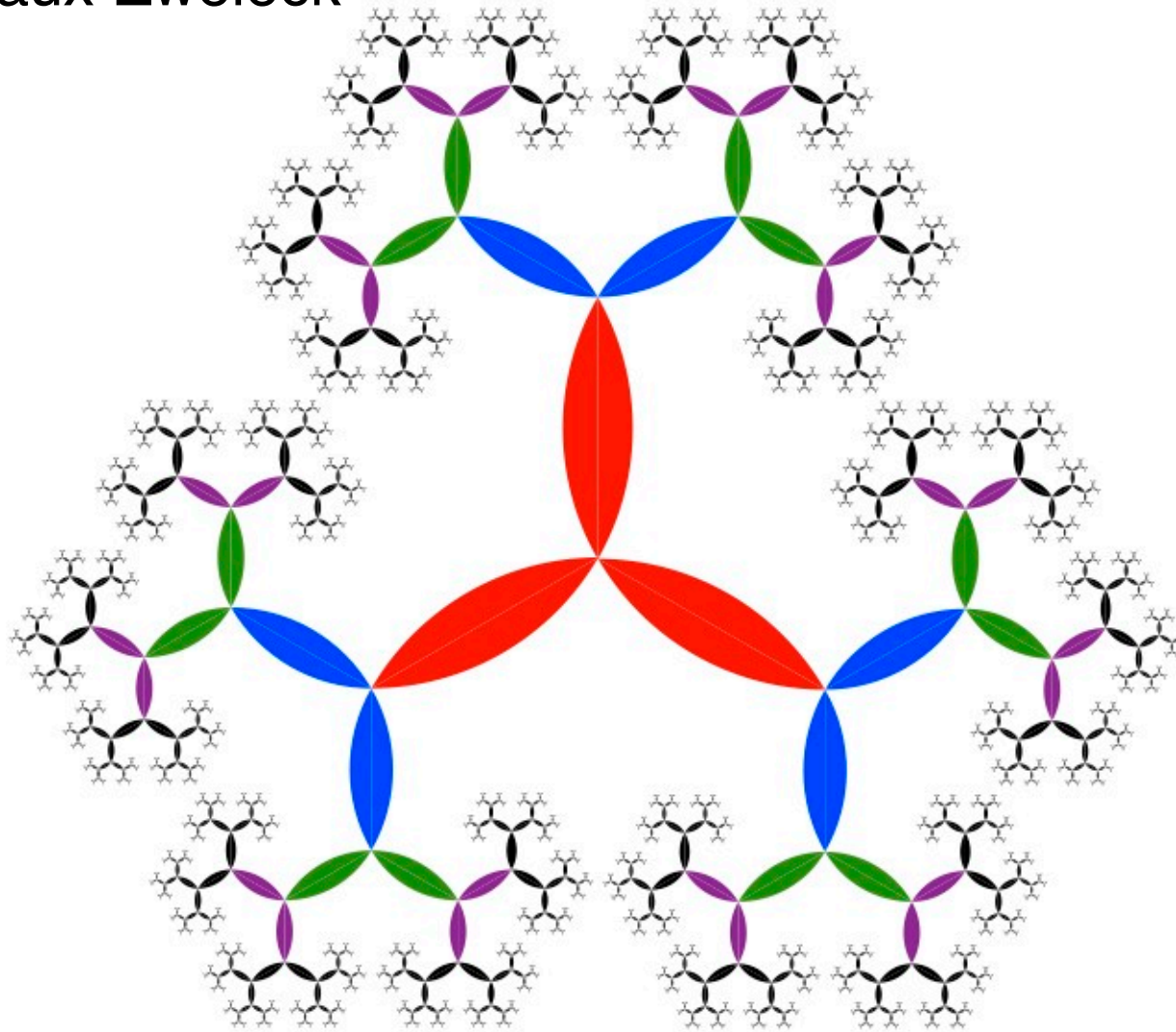
- Winkel an den Ecken
- Bogenlänge



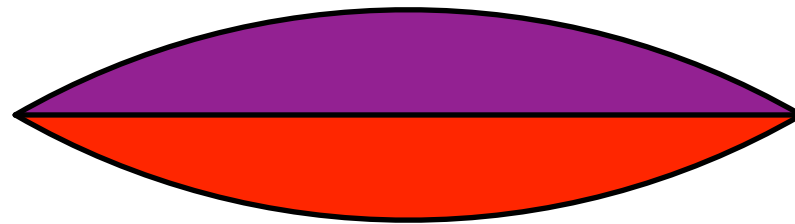
Reuleaux-Zweieck



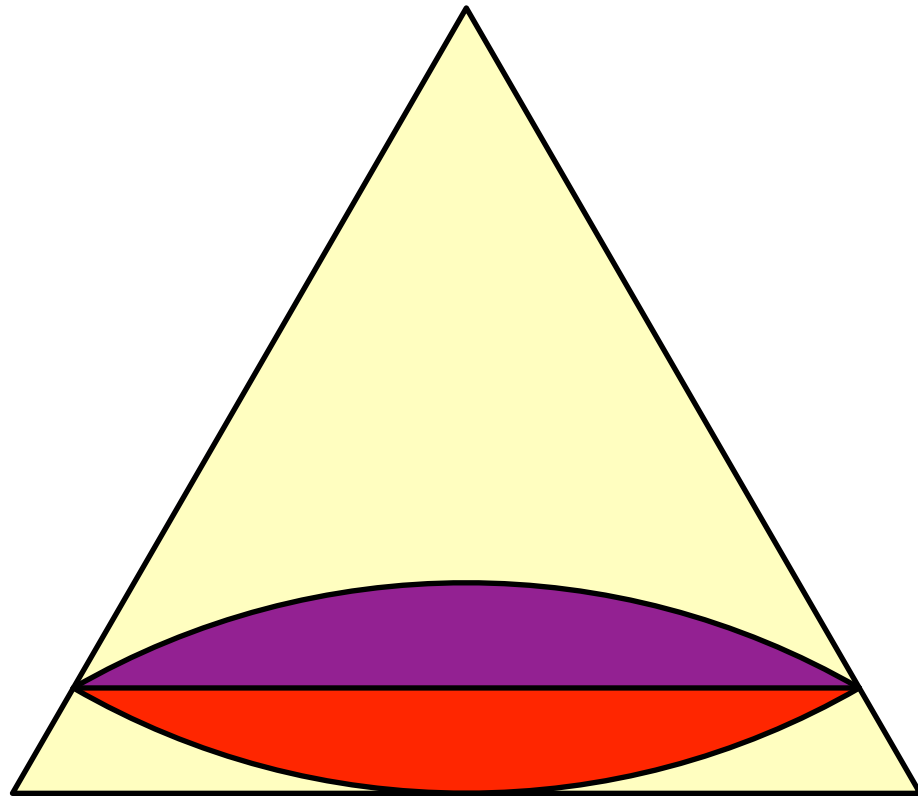
# Reuleaux-Zweieck



Reuleaux-Zweieck

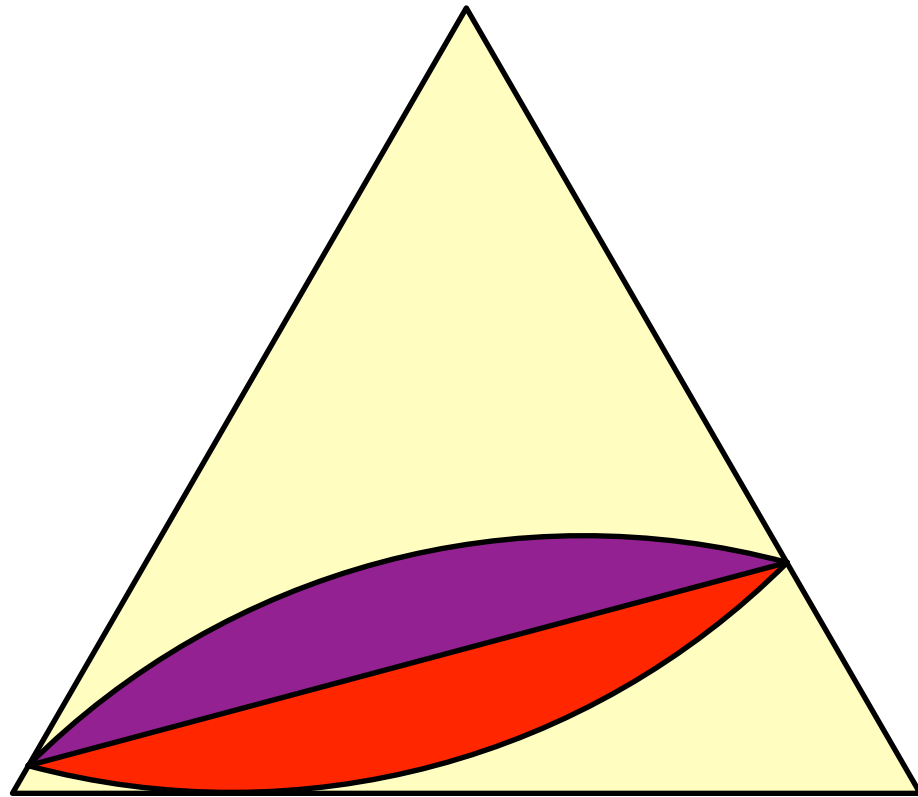


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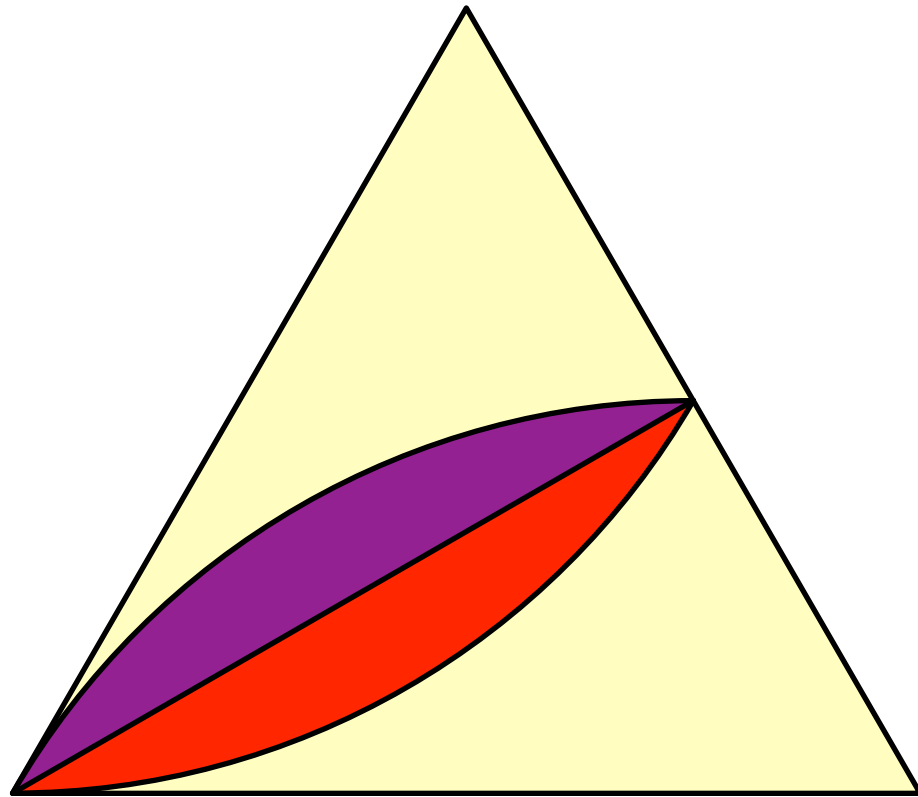




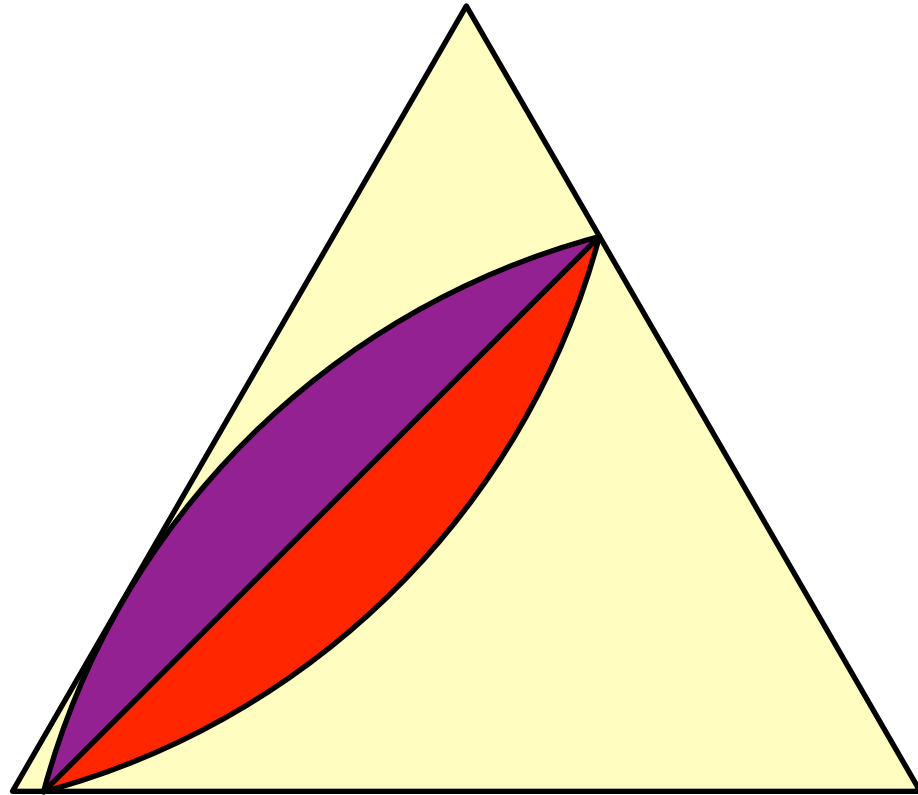
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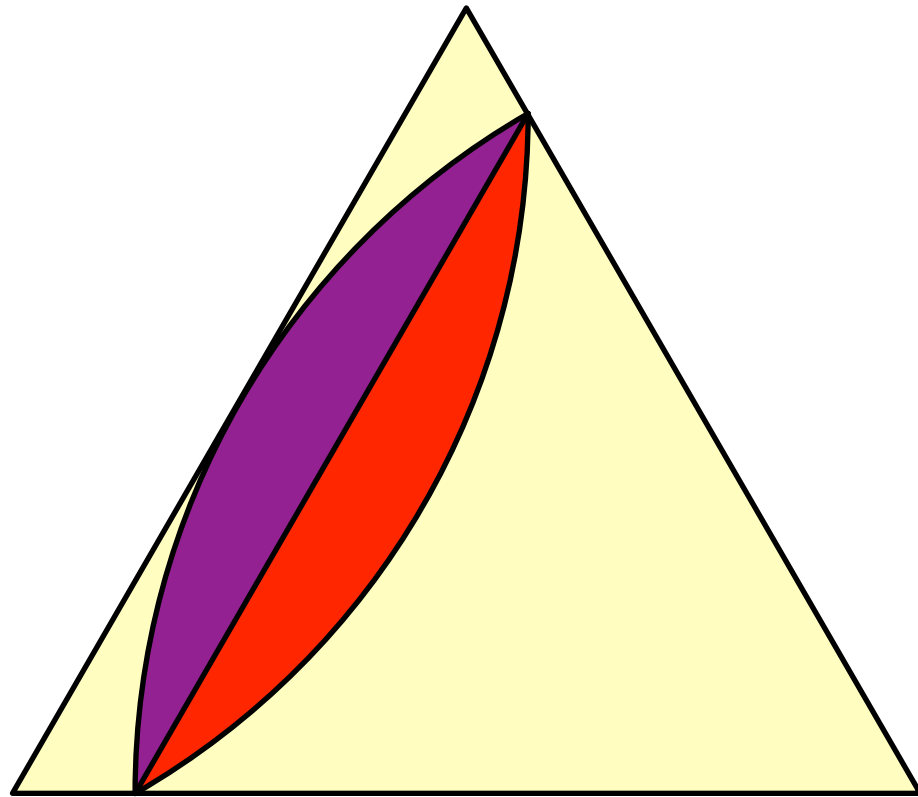
Reuleaux-Zweieck



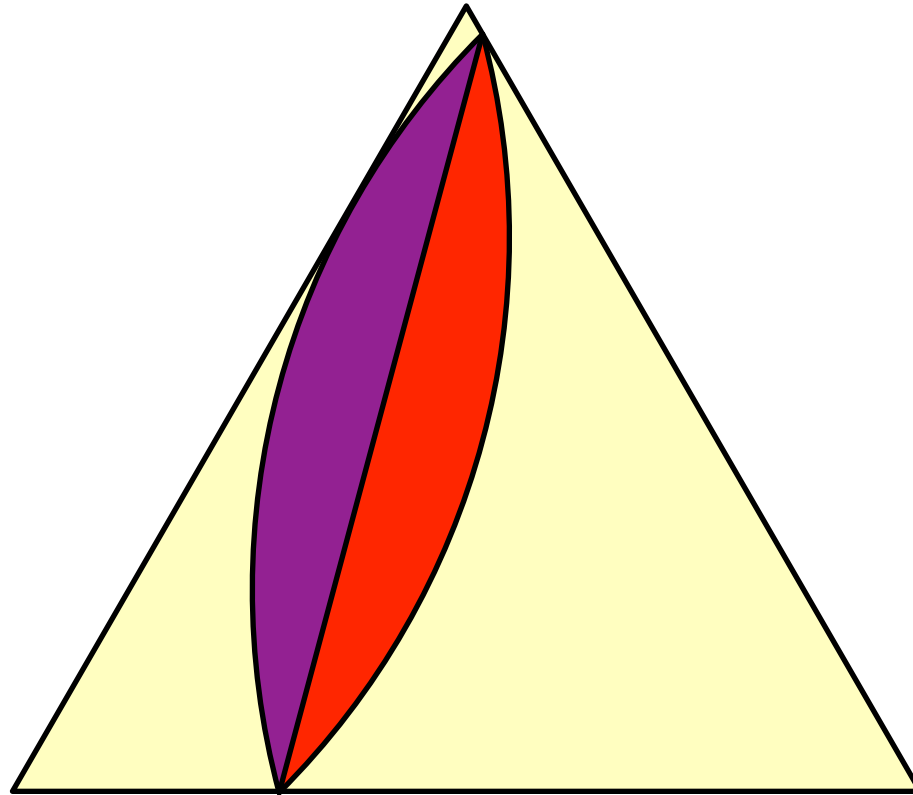
# Reuleaux-Zweieck



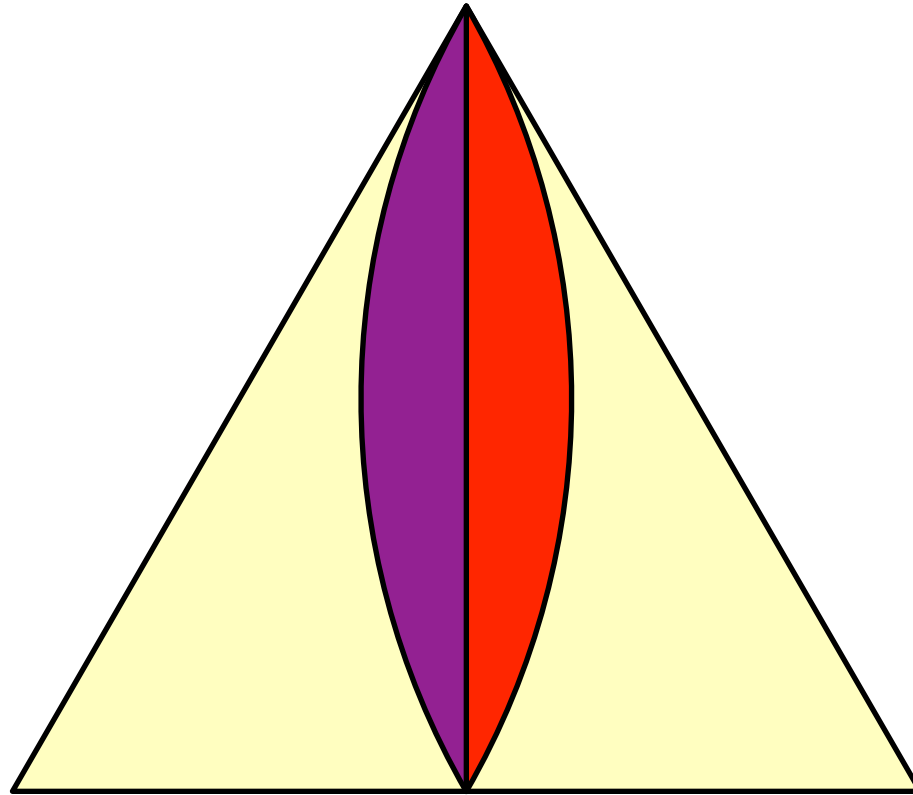
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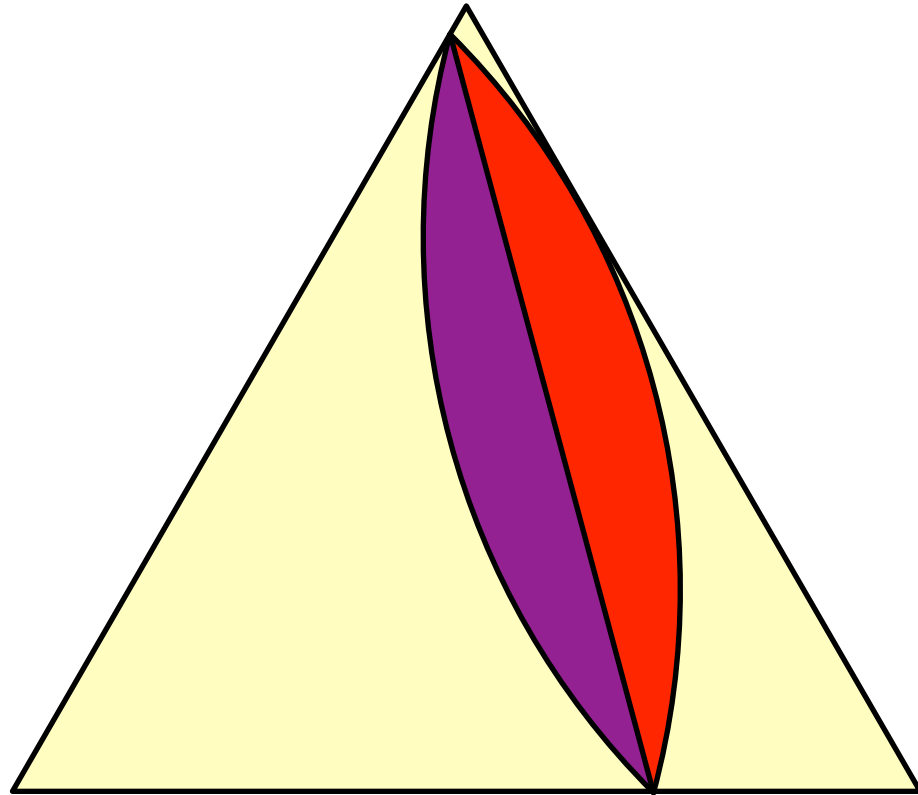
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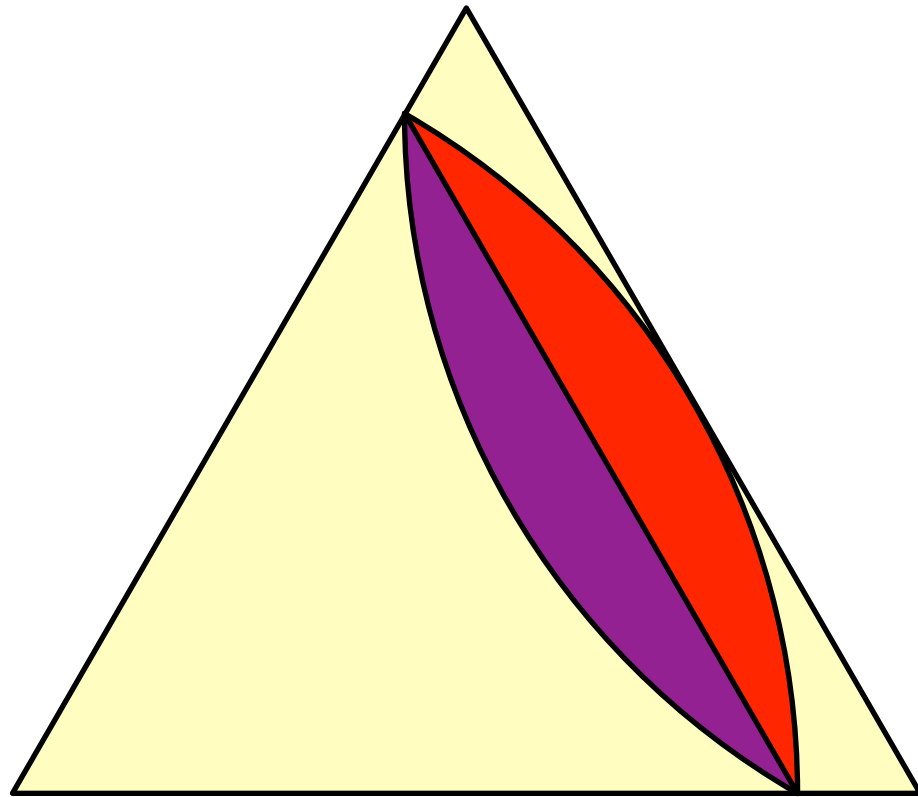
# Reuleaux-Zweieck



# Reuleaux-Zweieck

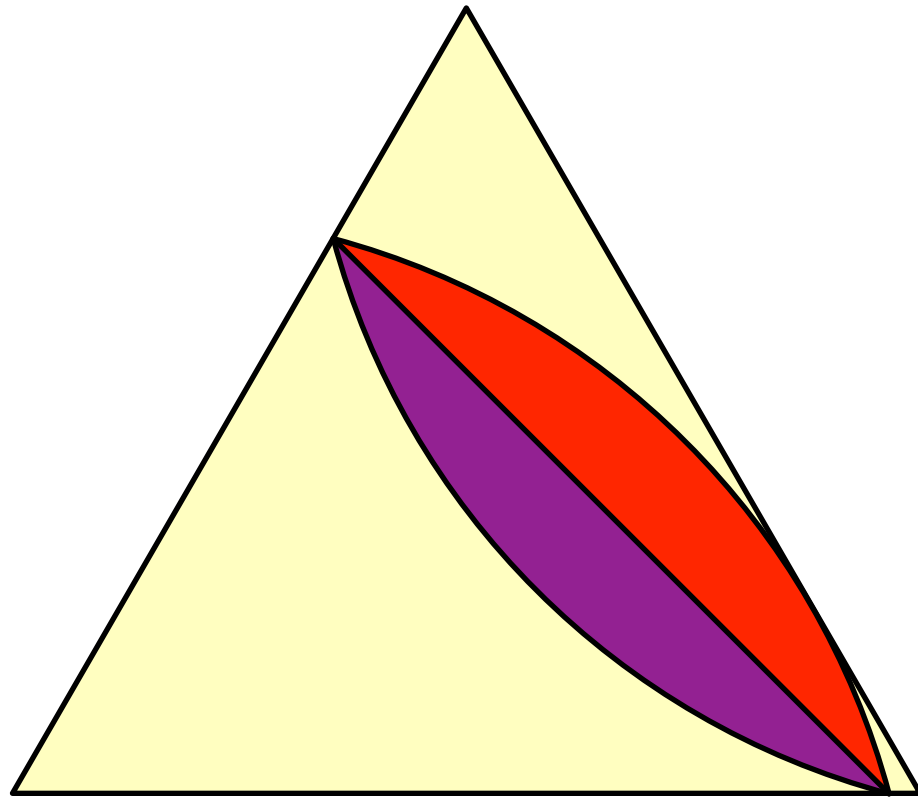


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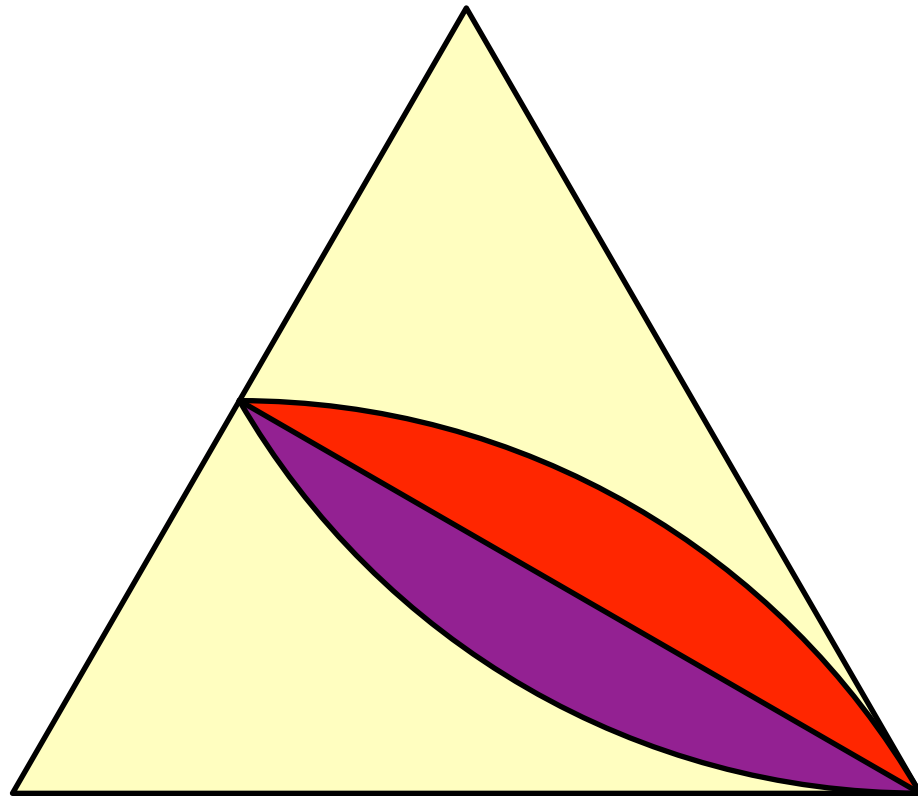




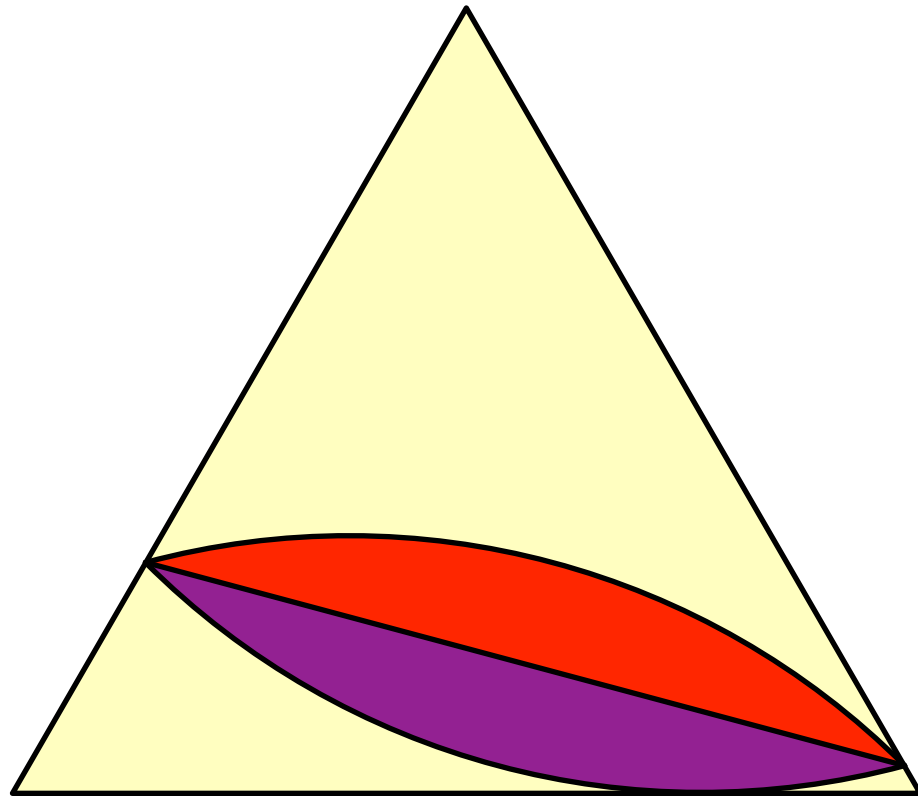
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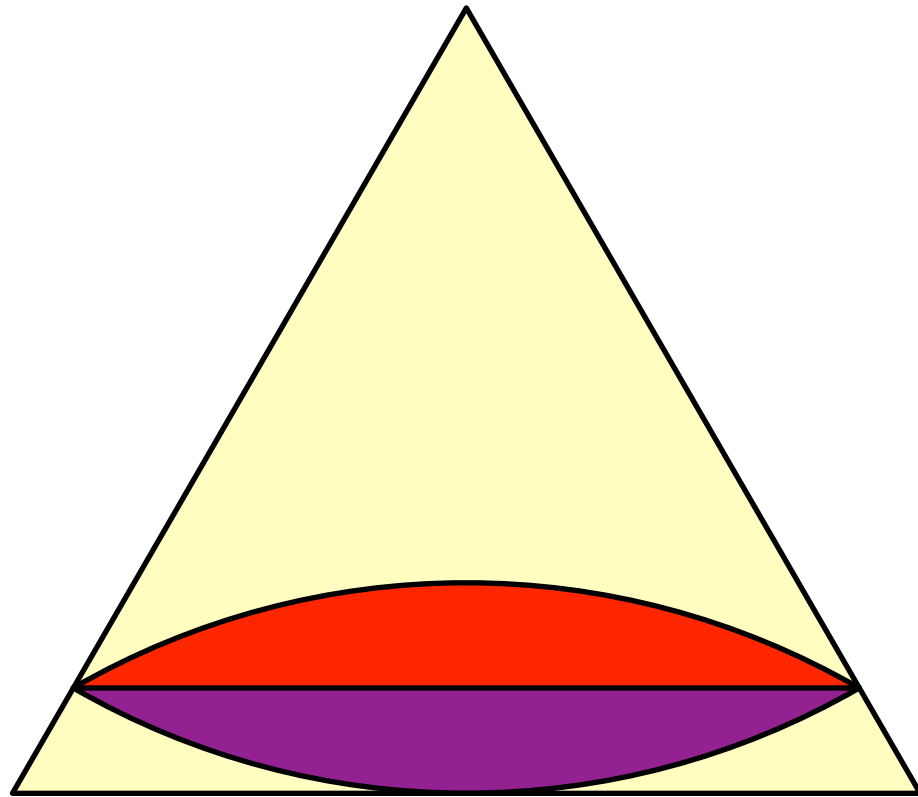
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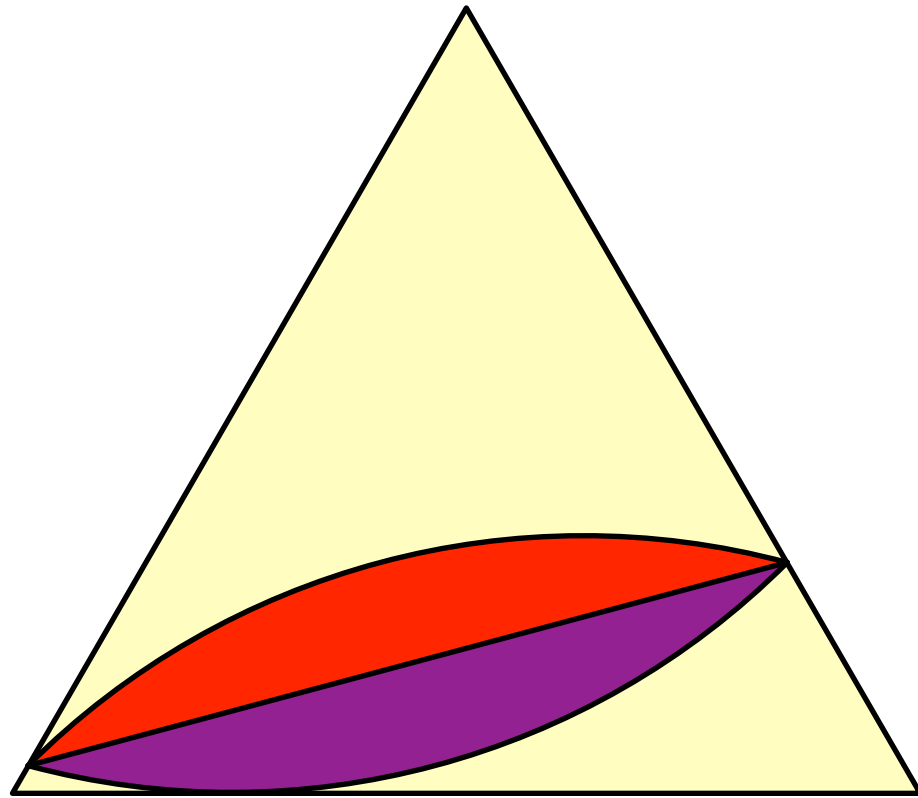
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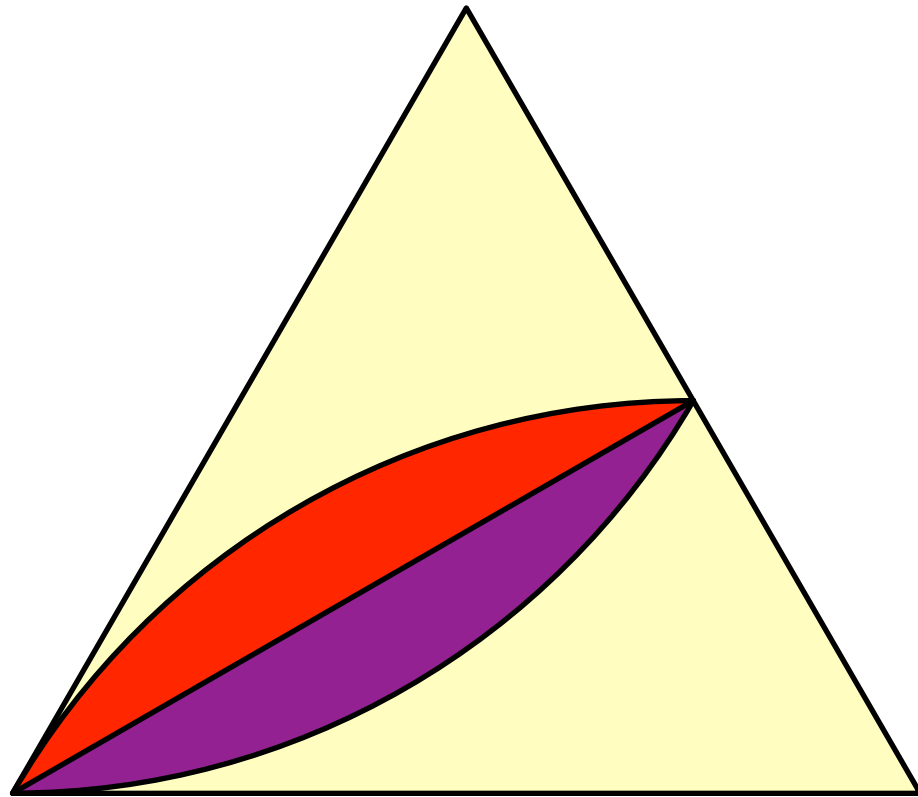
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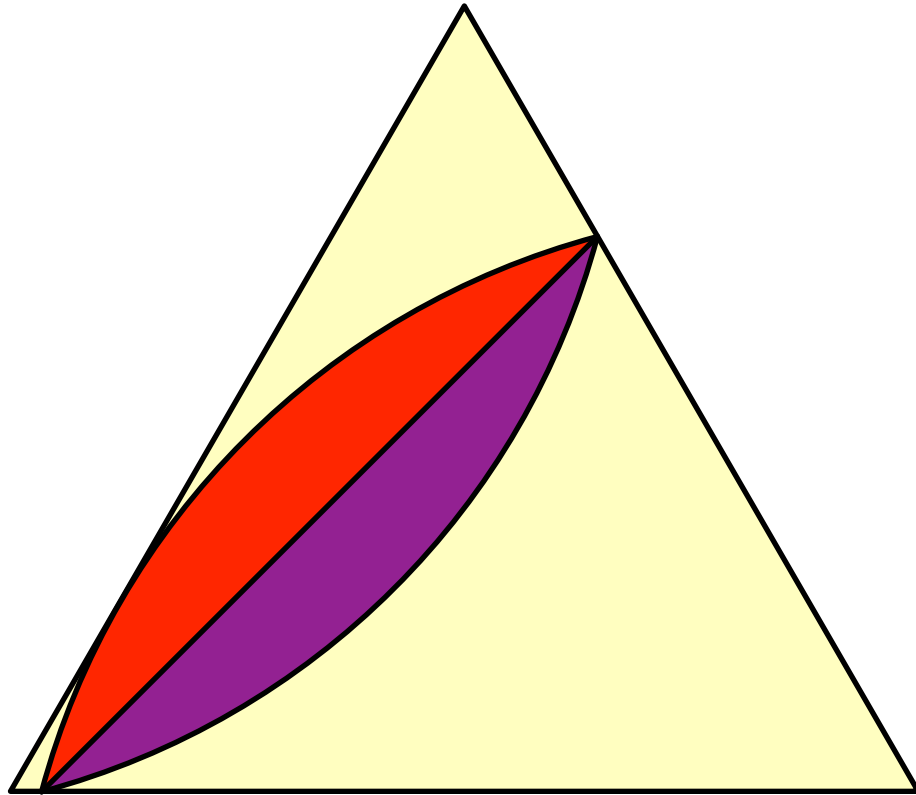
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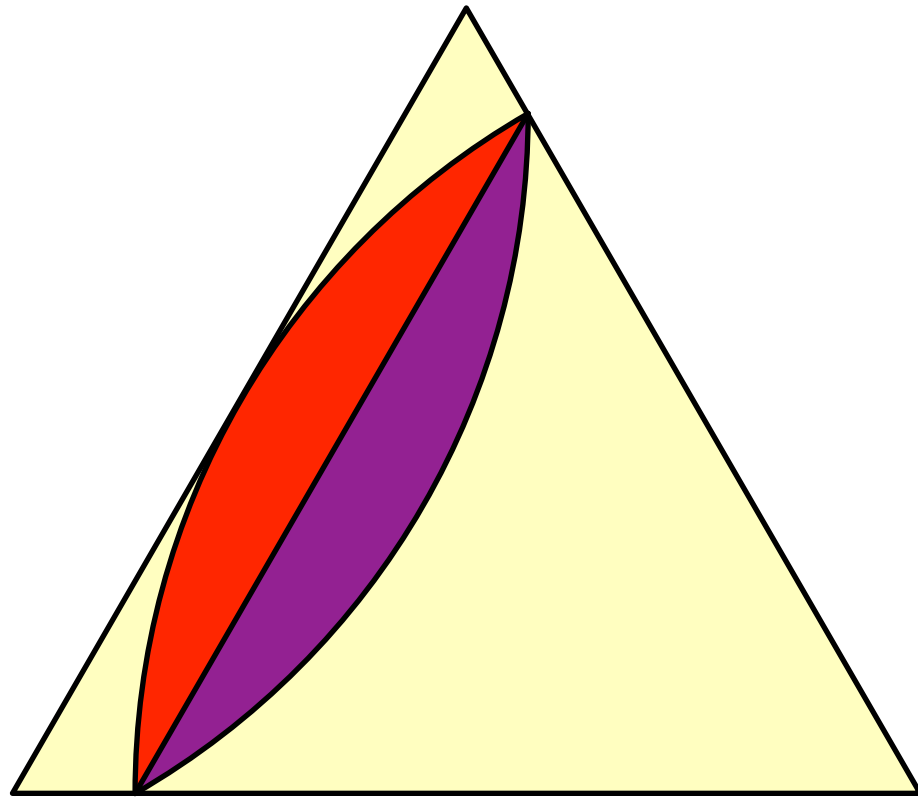
# Reuleaux-Zweieck



# Reuleaux-Zweieck

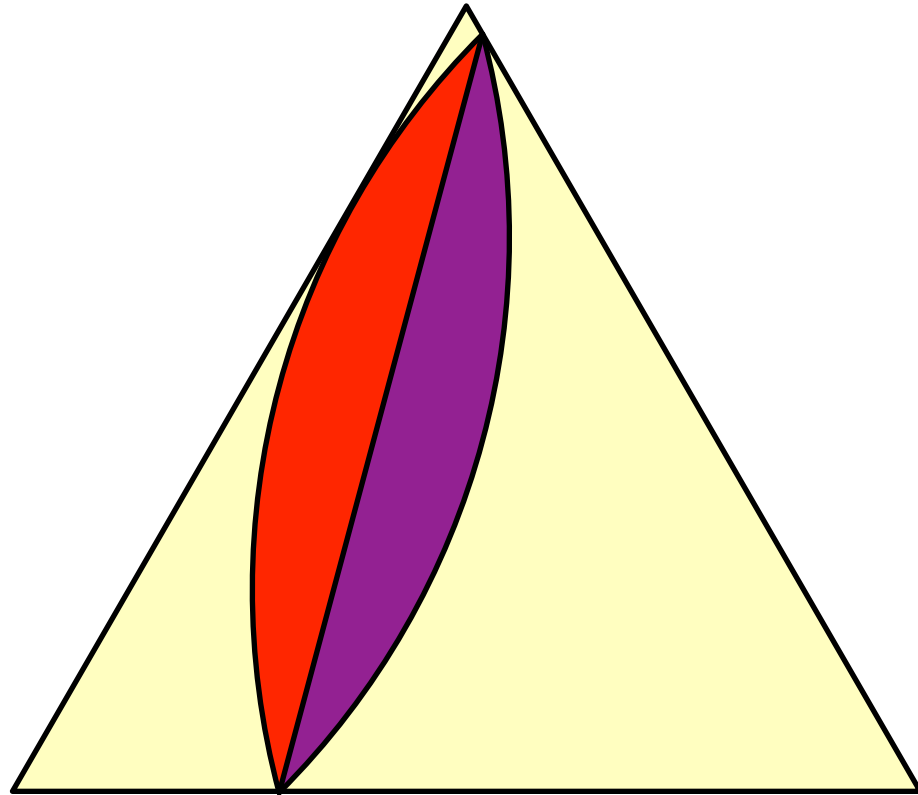


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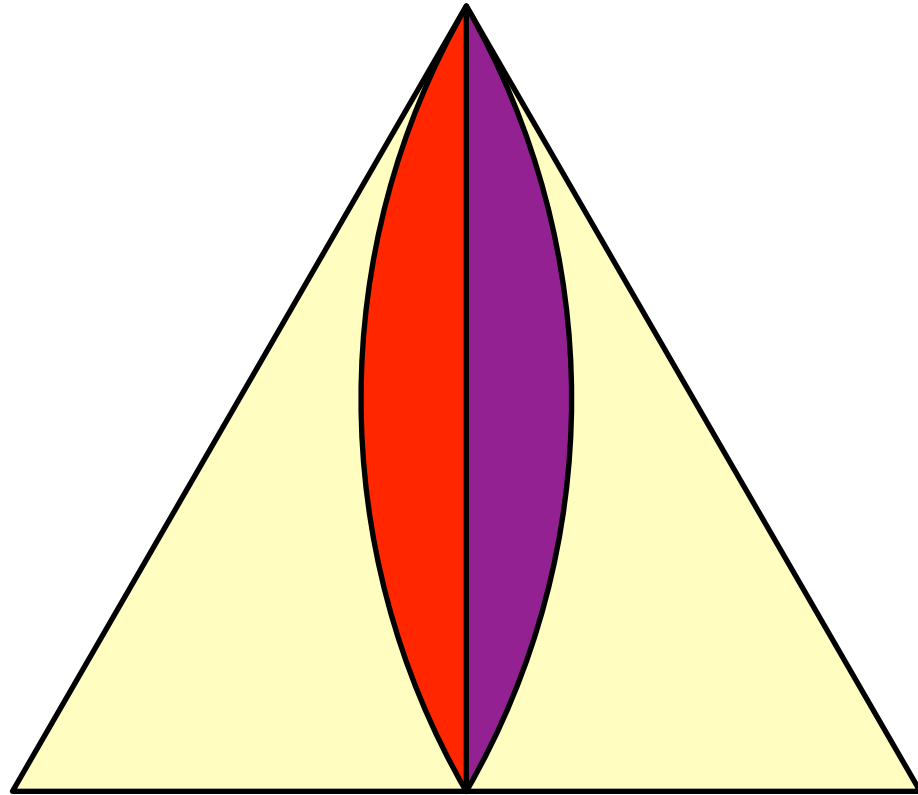




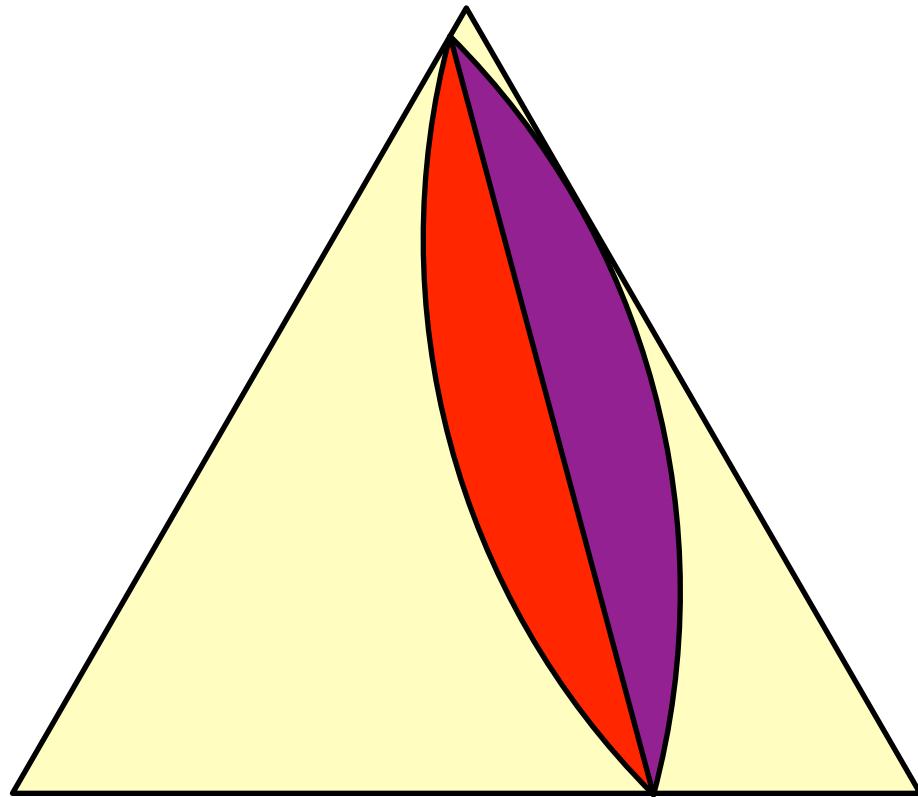
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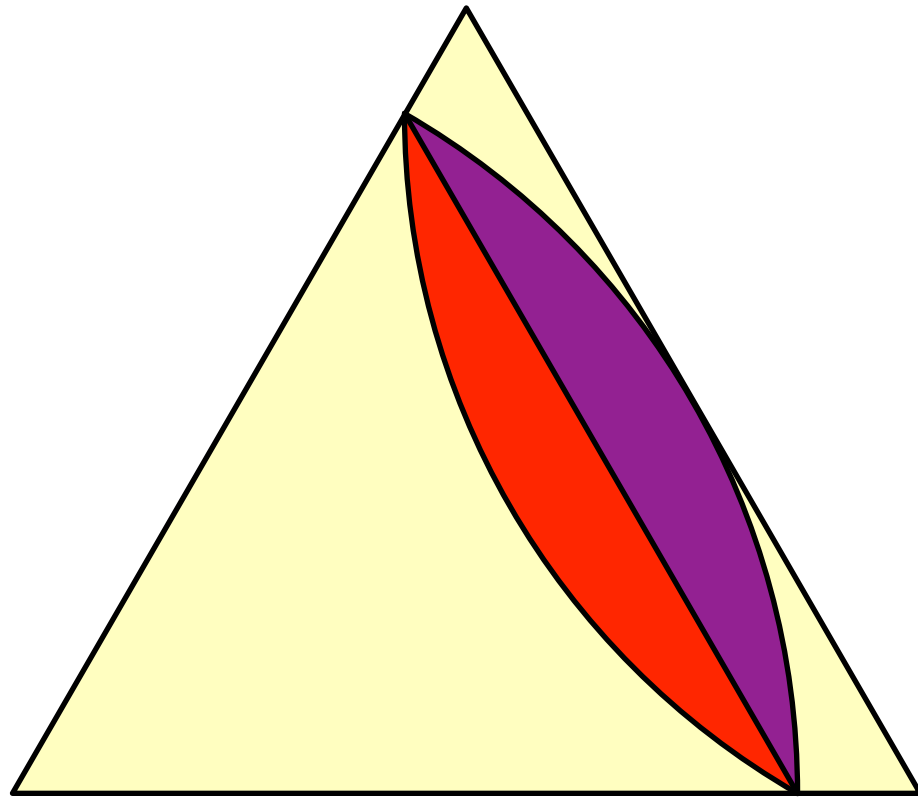
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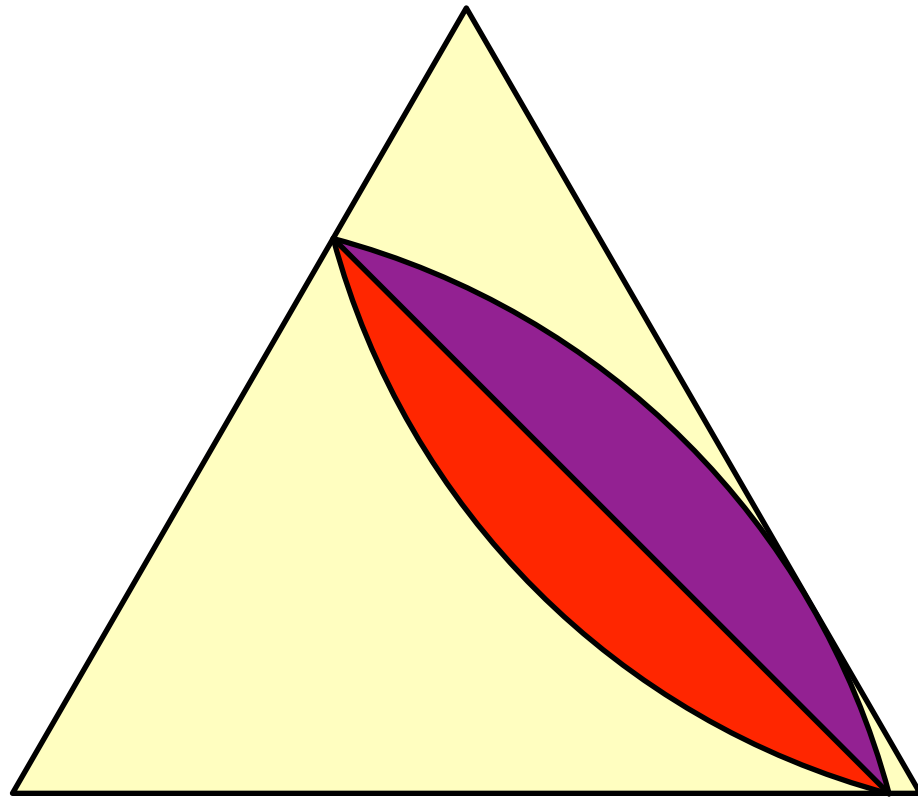
# Reuleaux-Zweieck



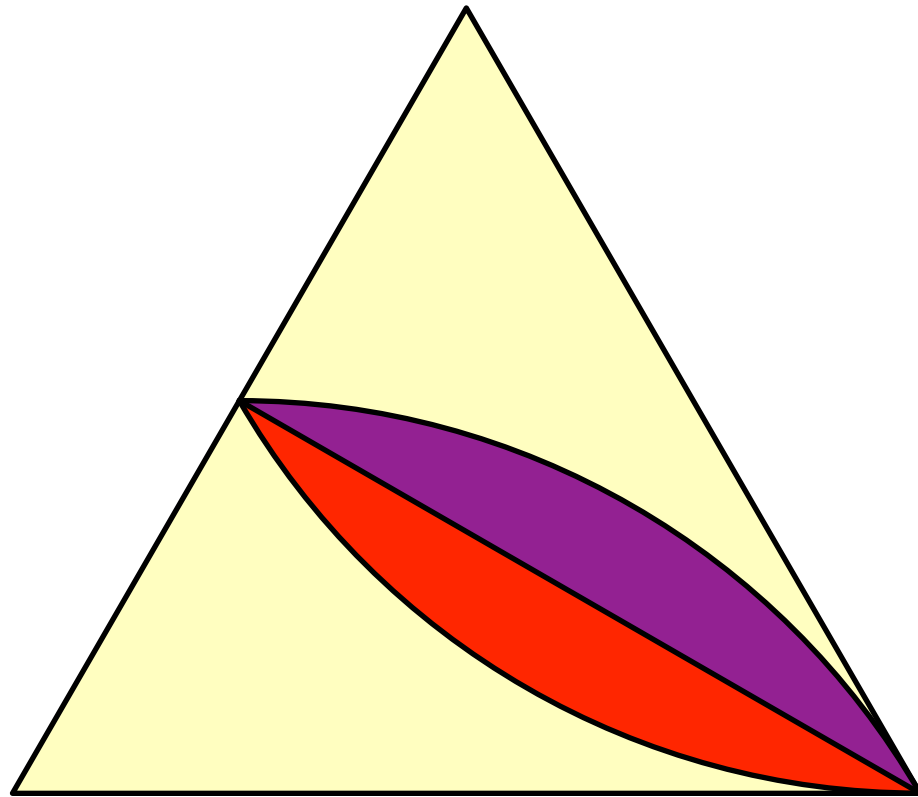
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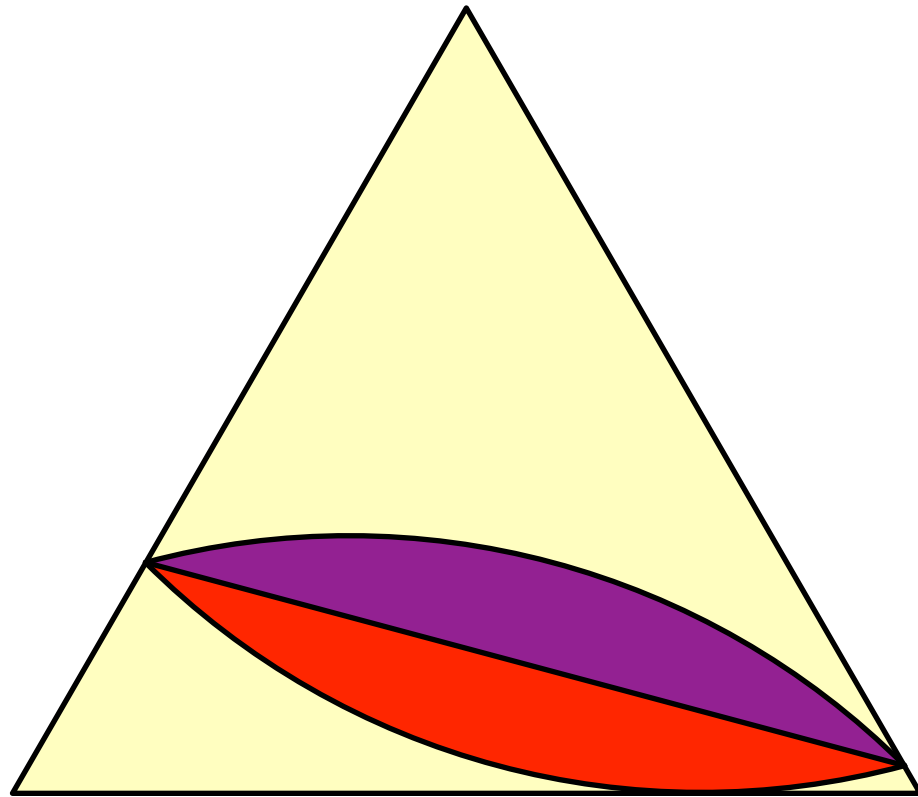
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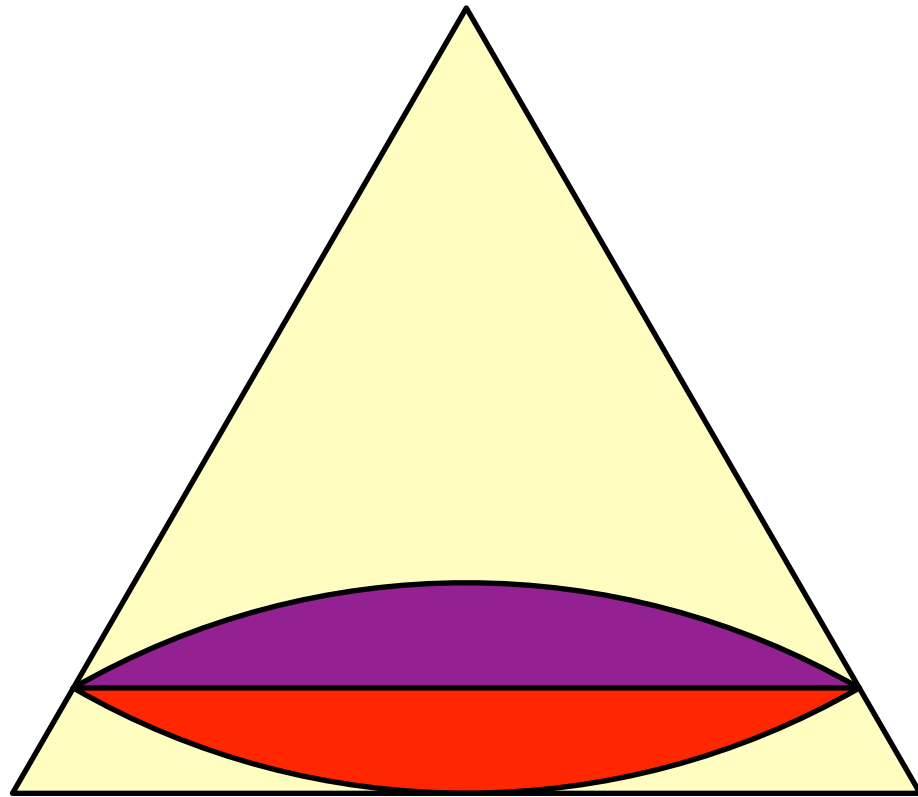
Reuleaux-Zweieck



Reuleaux-Zweieck



# Reuleaux-Zweieck

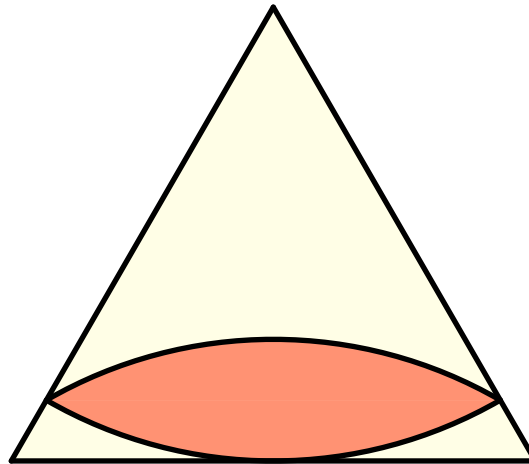




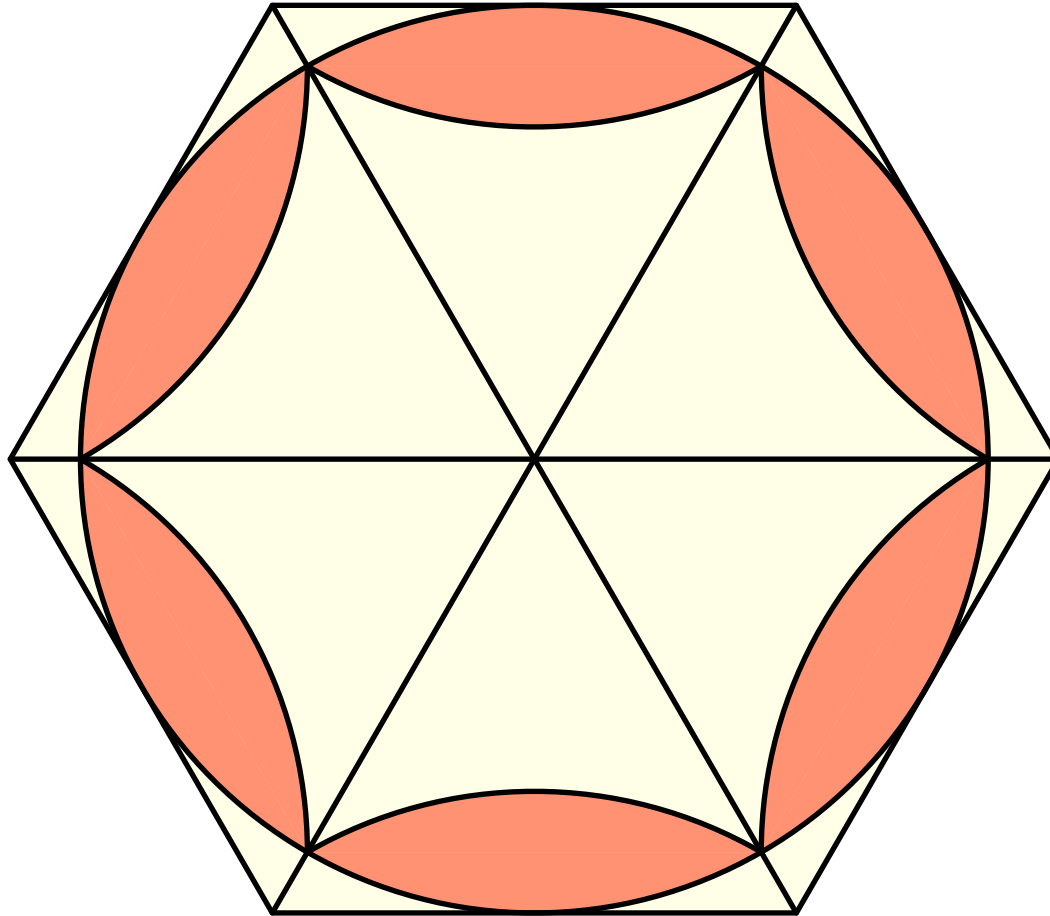
## Beweis: Rechnerisch

- Geradengleichung
- Kreisgleichung
- quadratische Gleichung

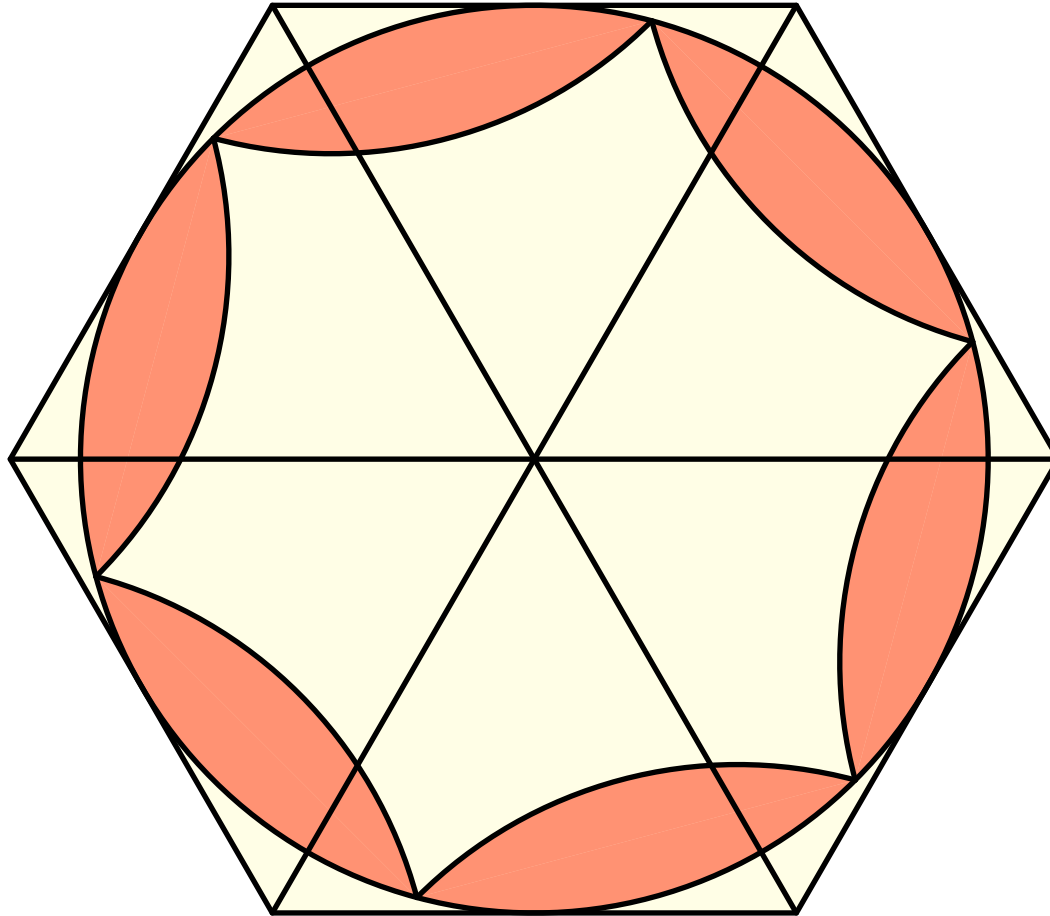
Beweis: Visuell und kinematisch



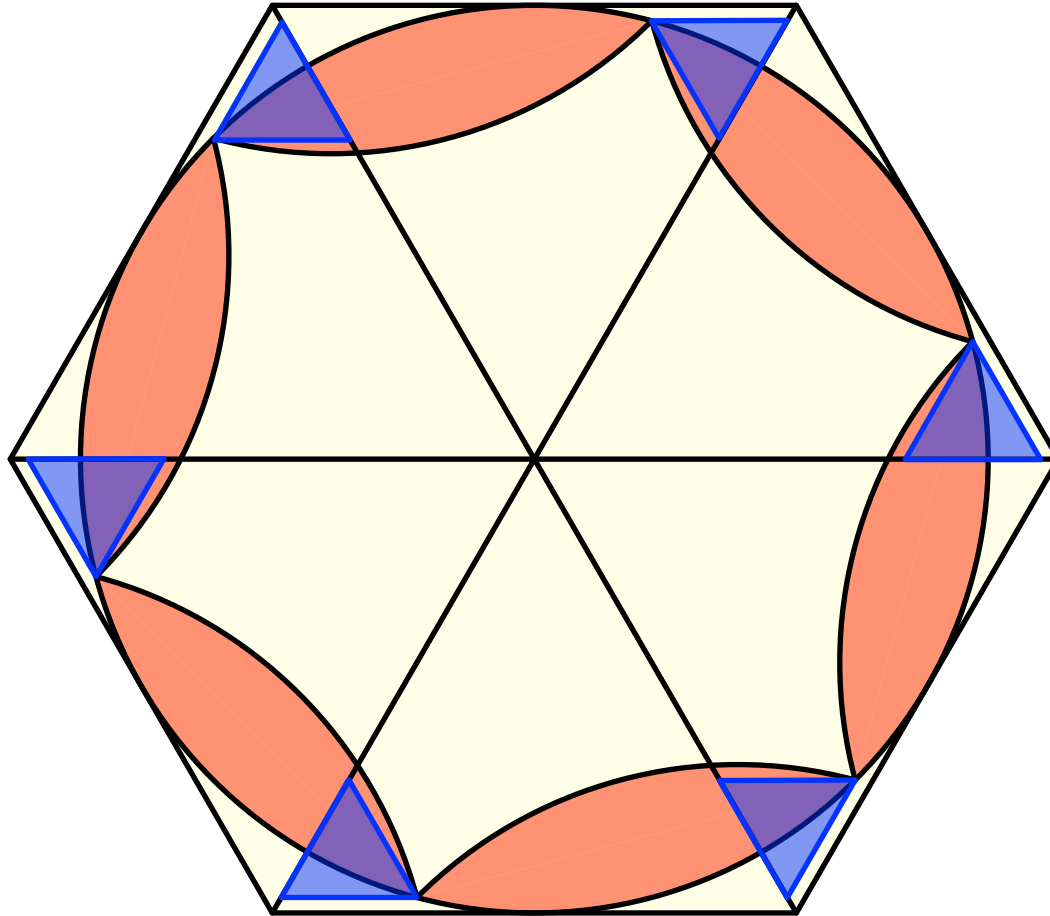
Beweis



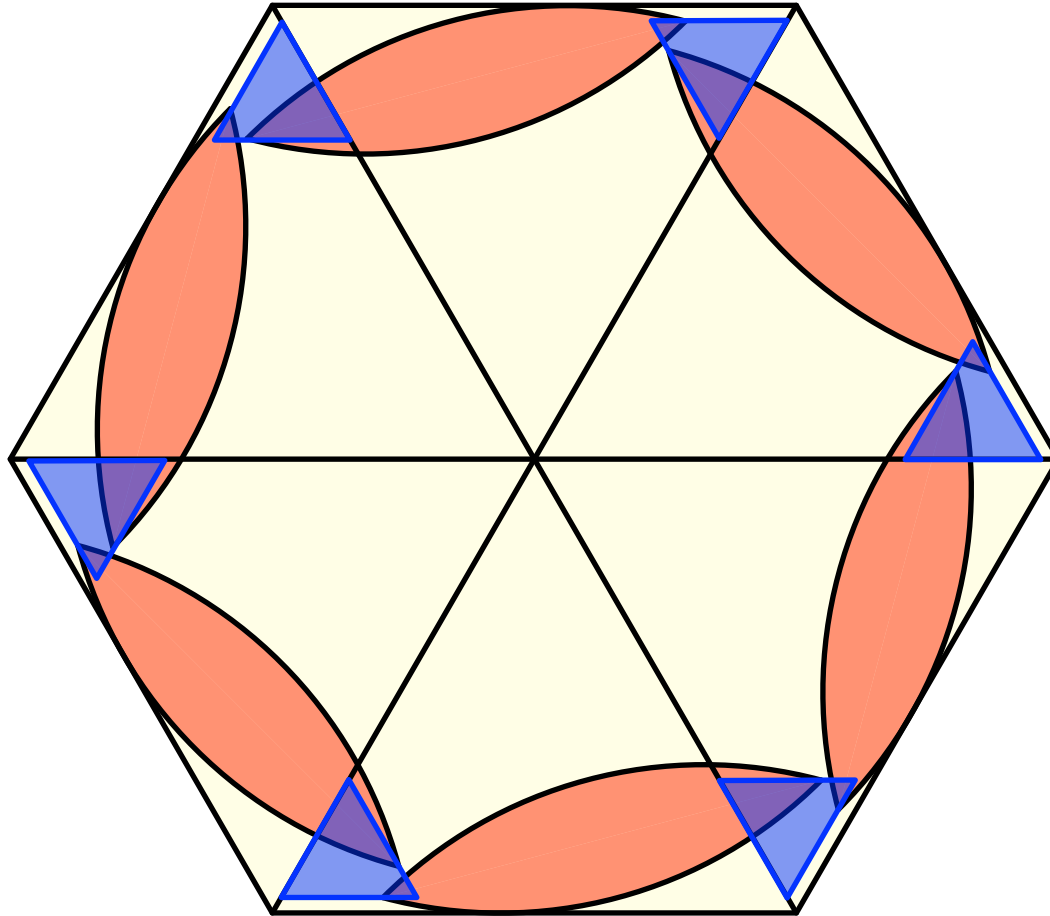
Beweis



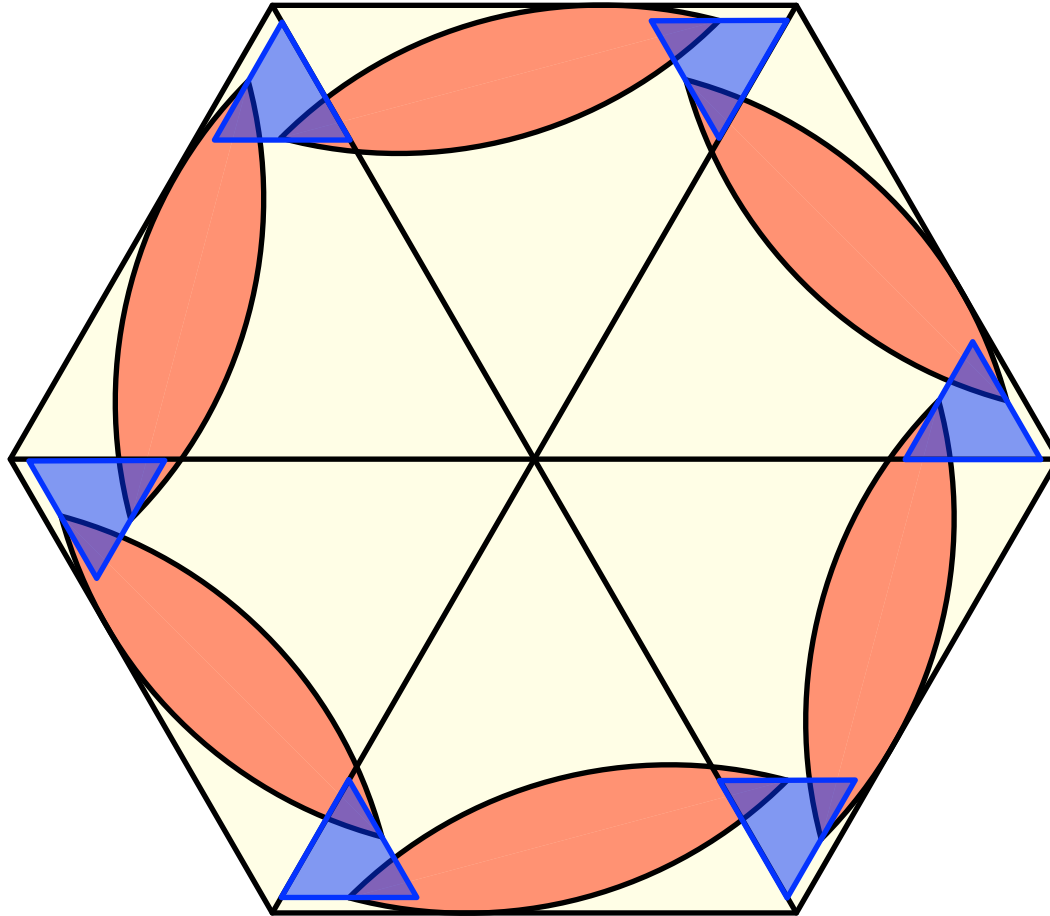
Beweis



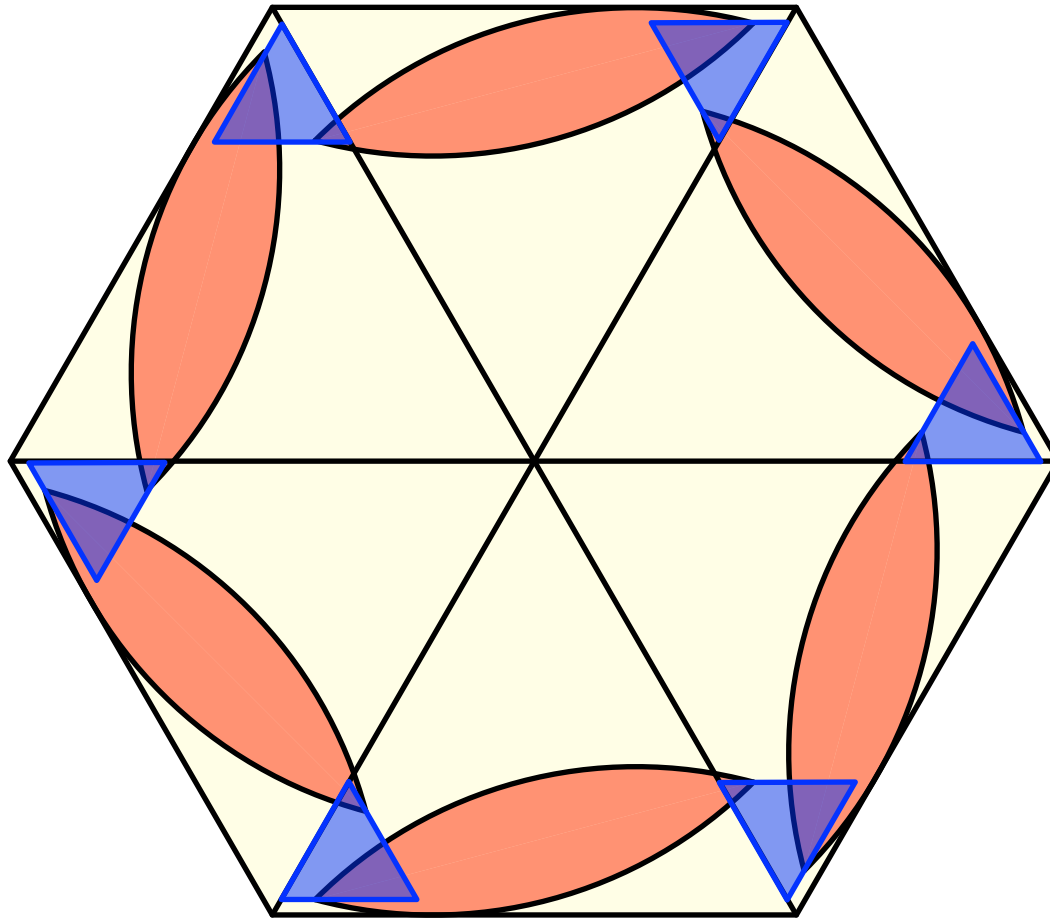
Beweis



Beweis

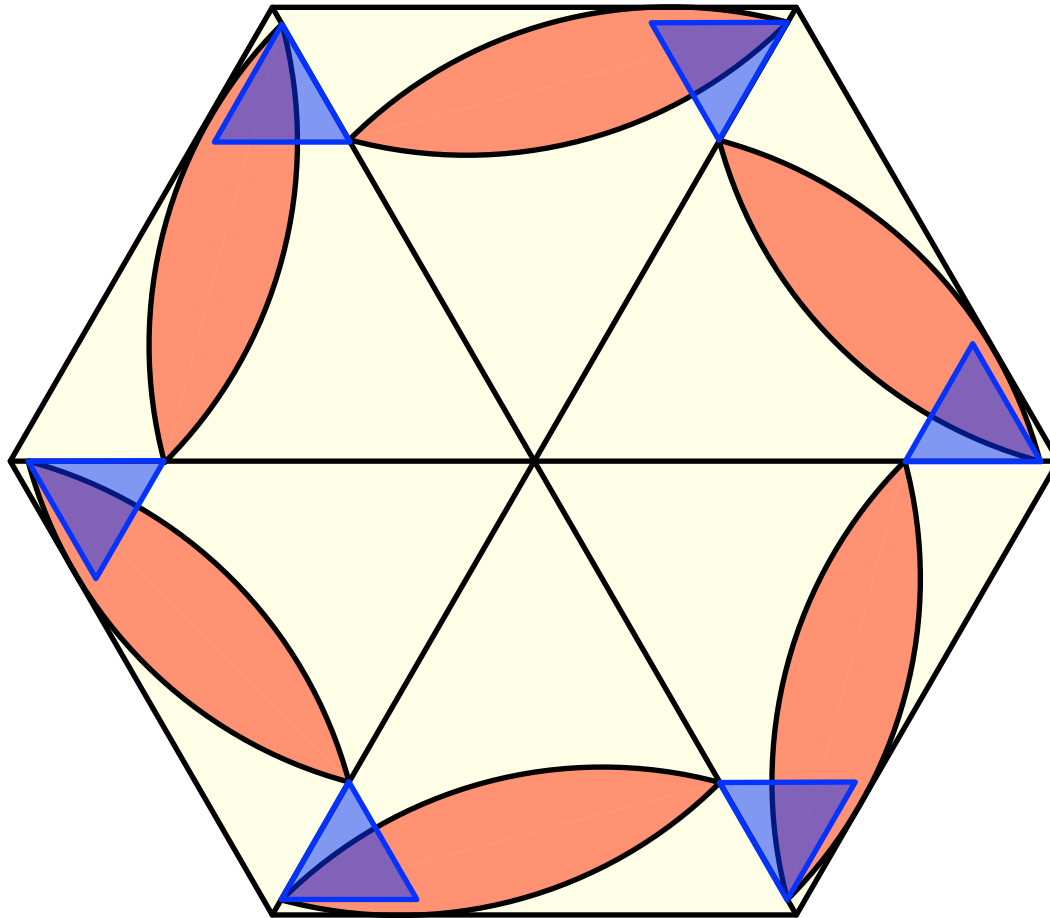


Beweis

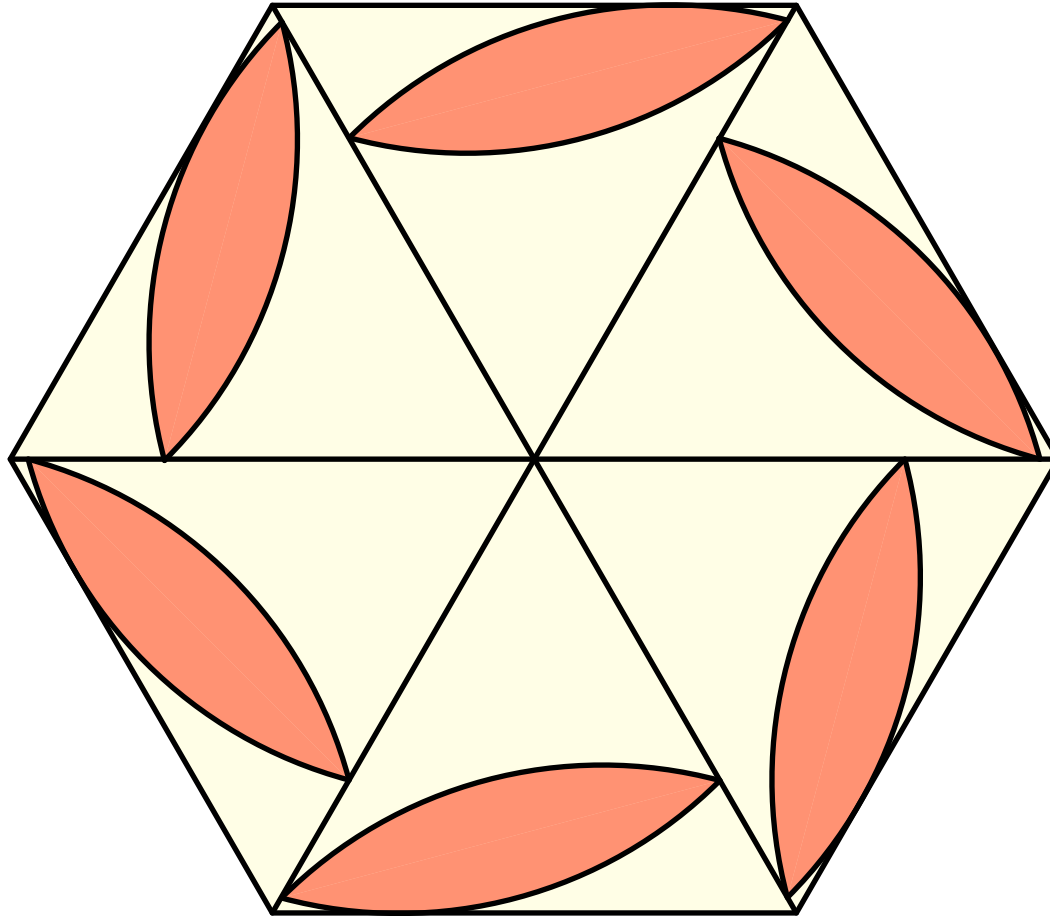




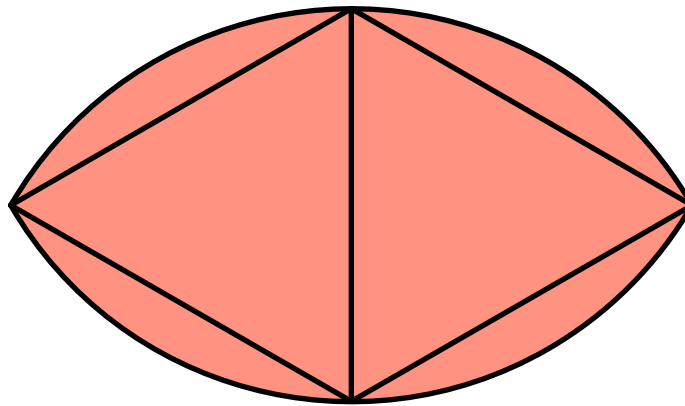
Beweis



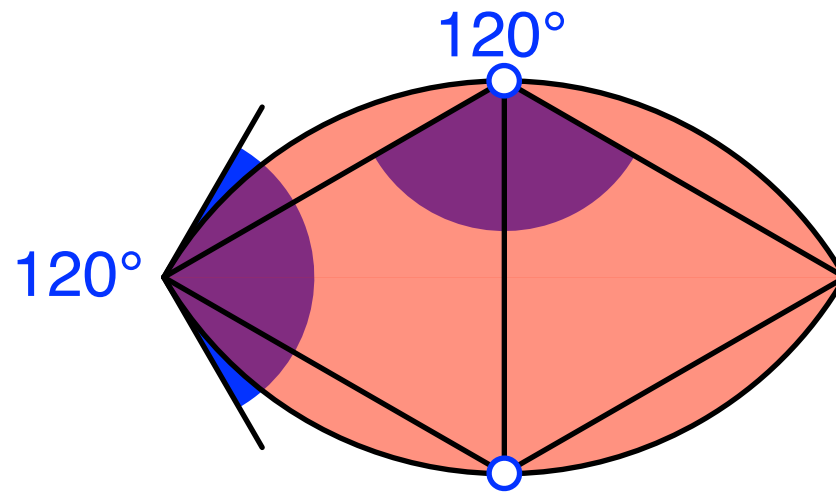
Beweis



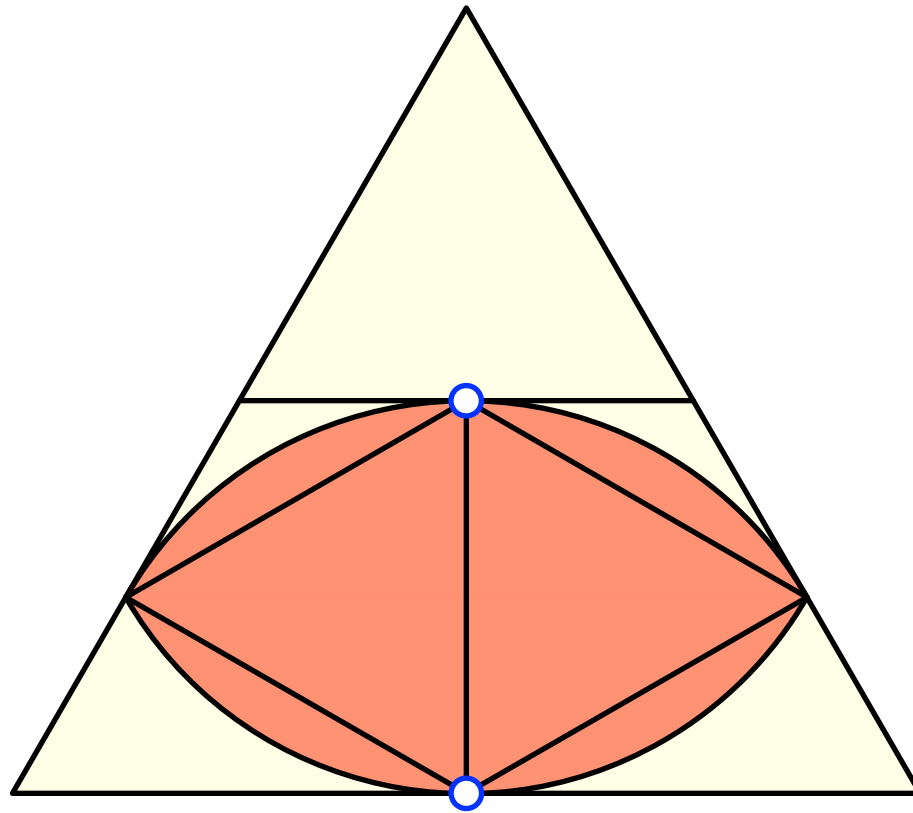
120°-Zweieck



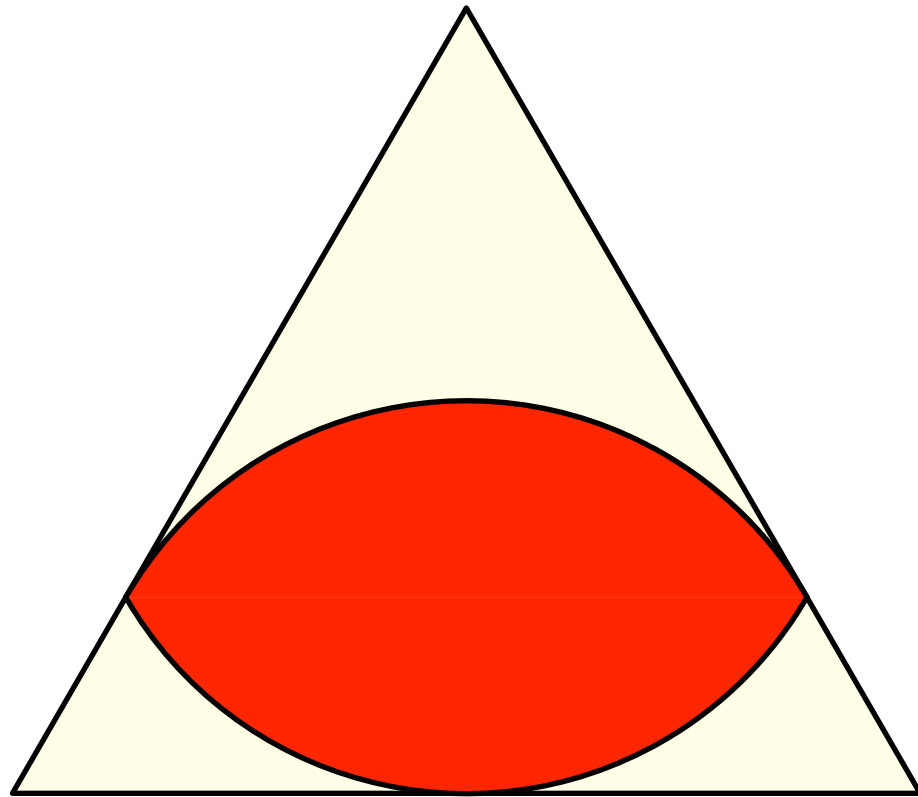
120°-Zweieck



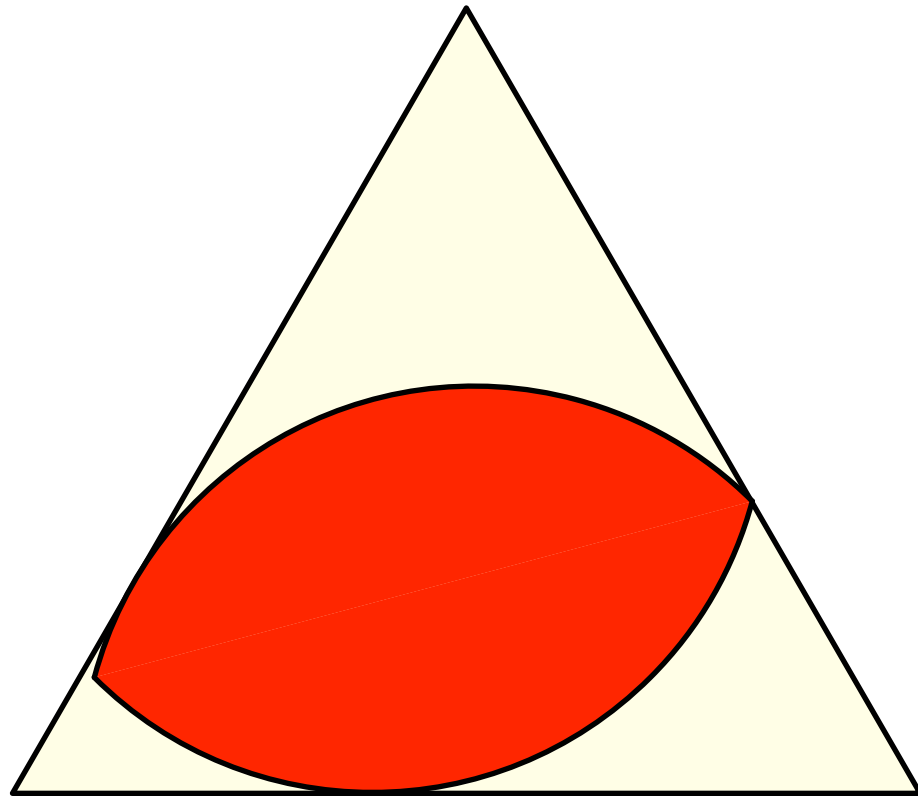
120°-Zweieck



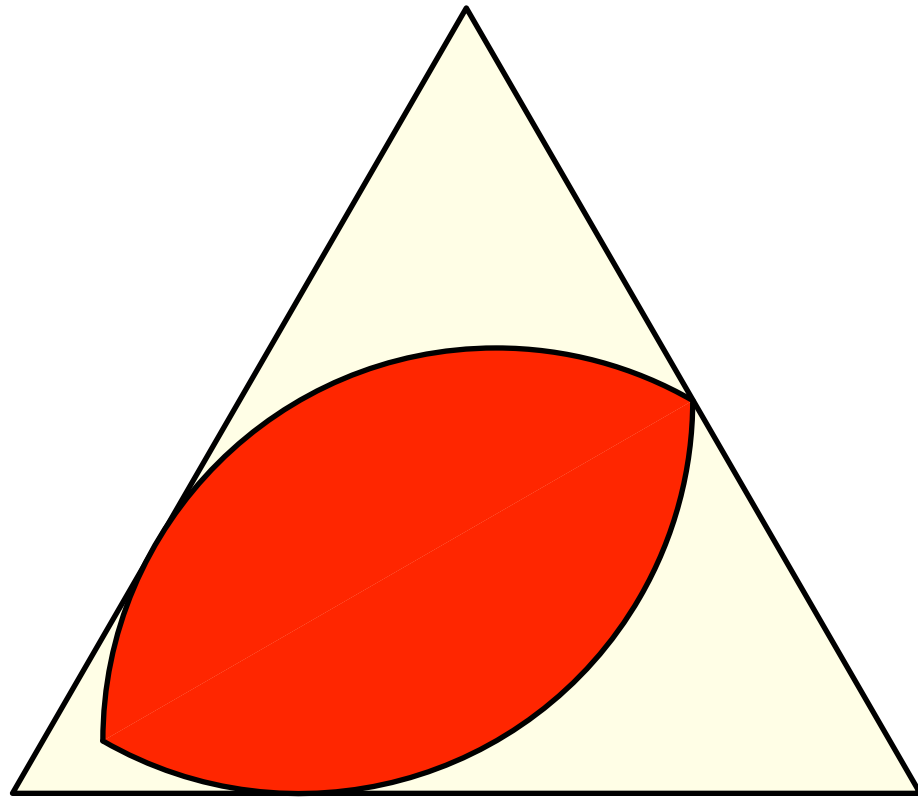
120°-Zweieck



120°-Zweieck

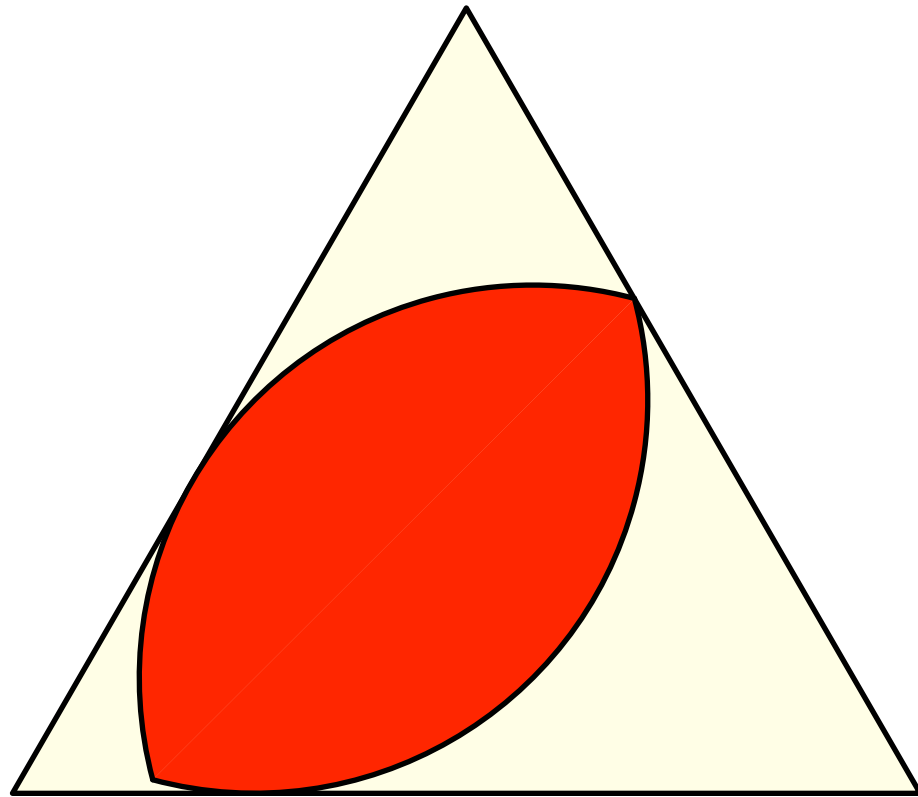


120°-Zweieck

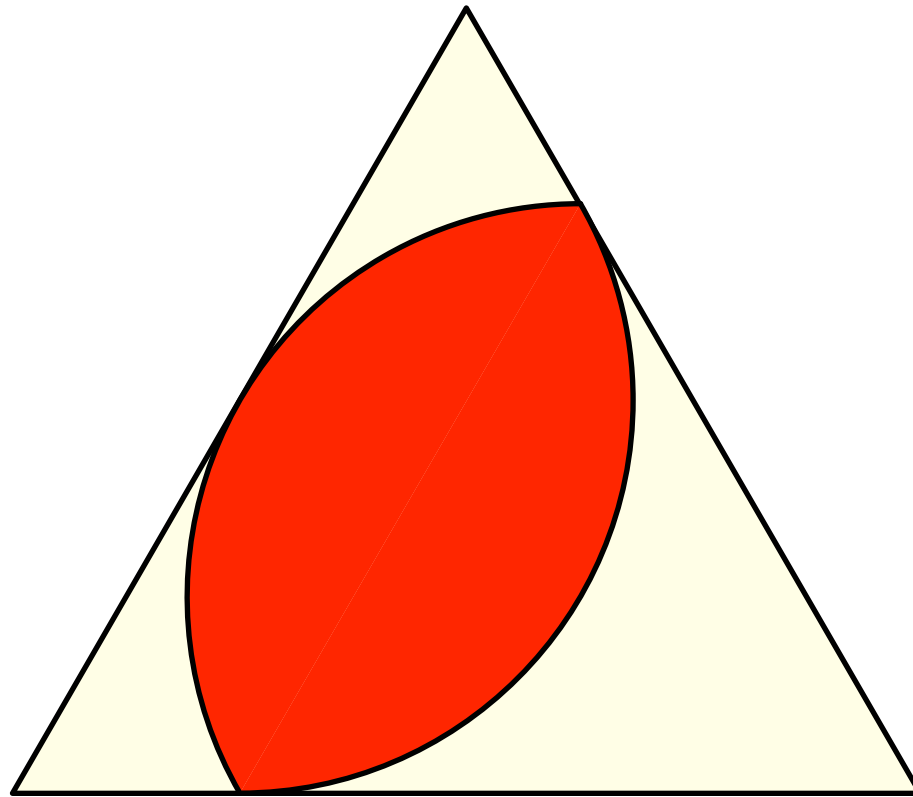




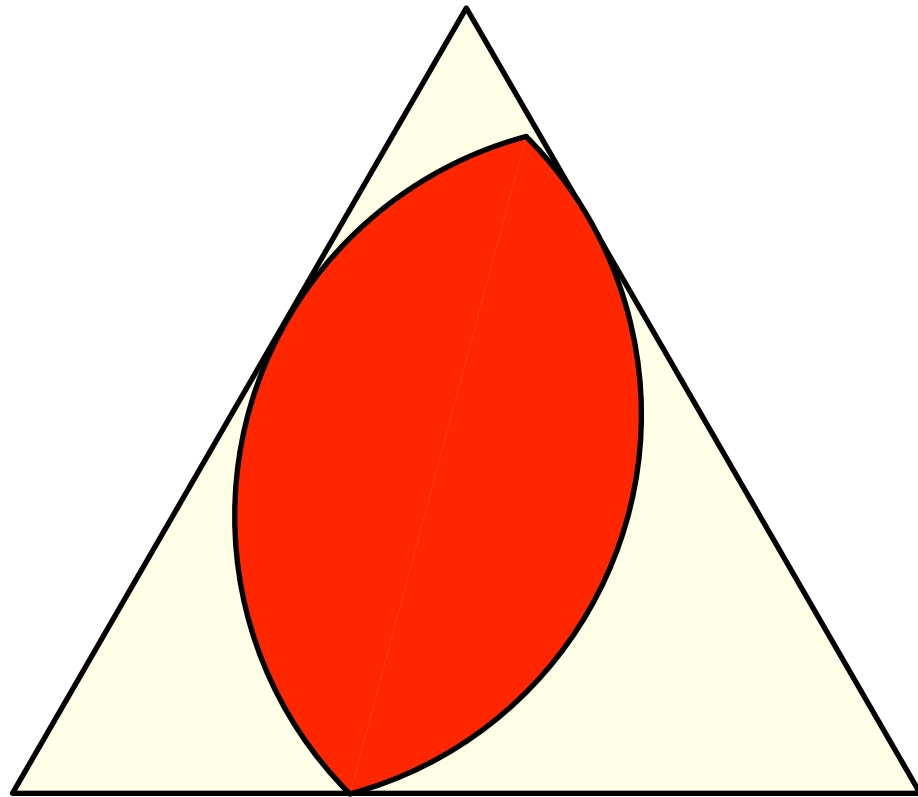
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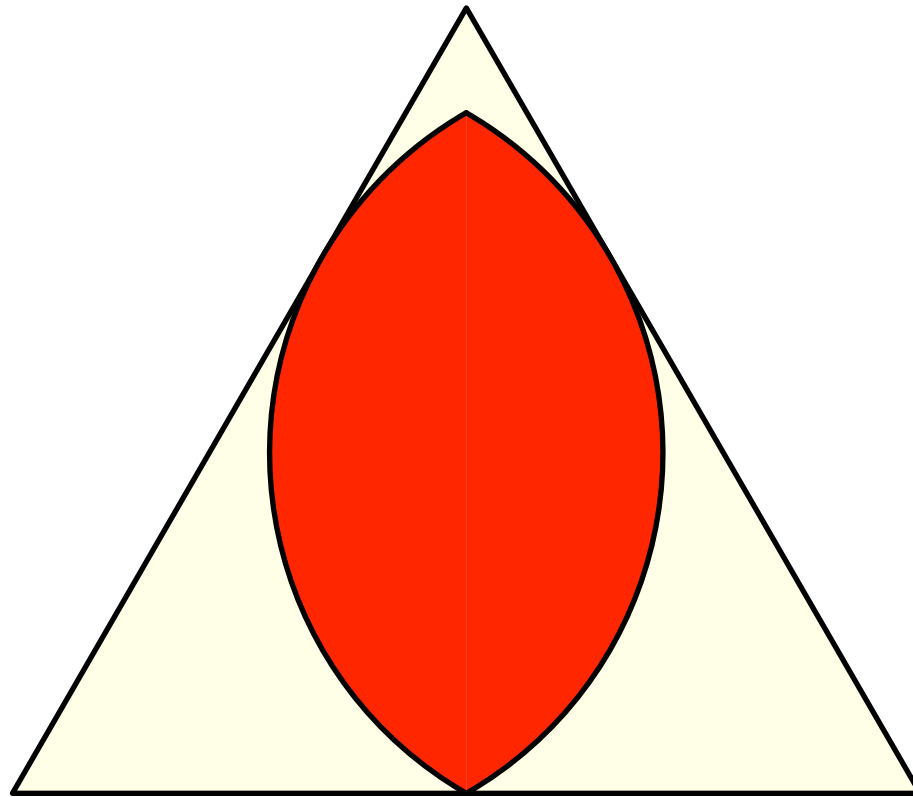
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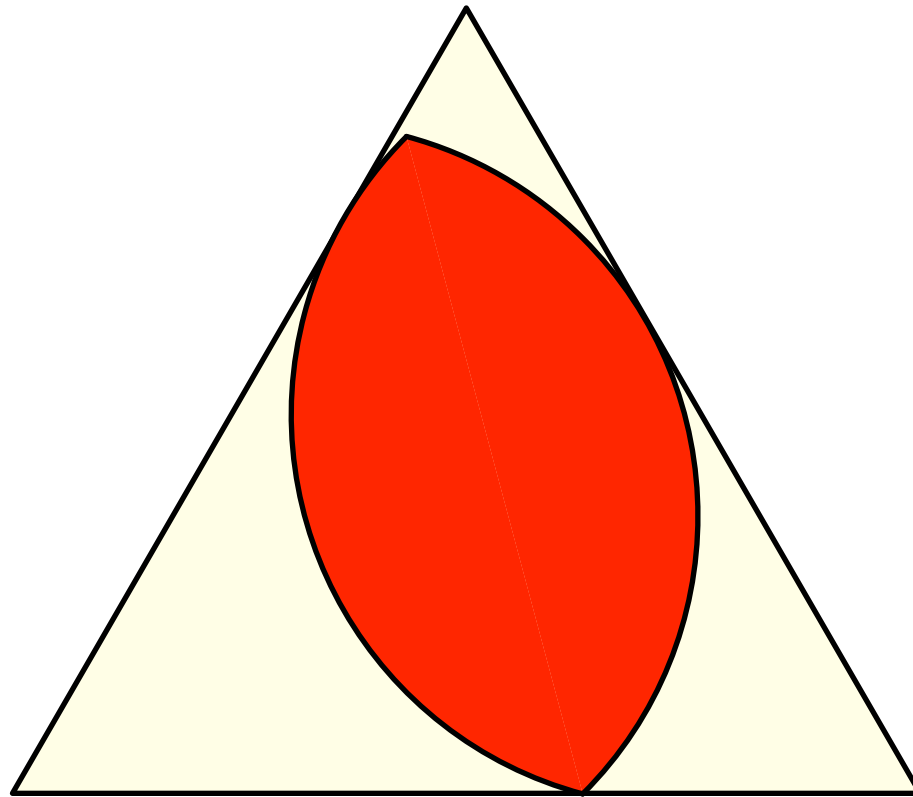
120°-Zweieck



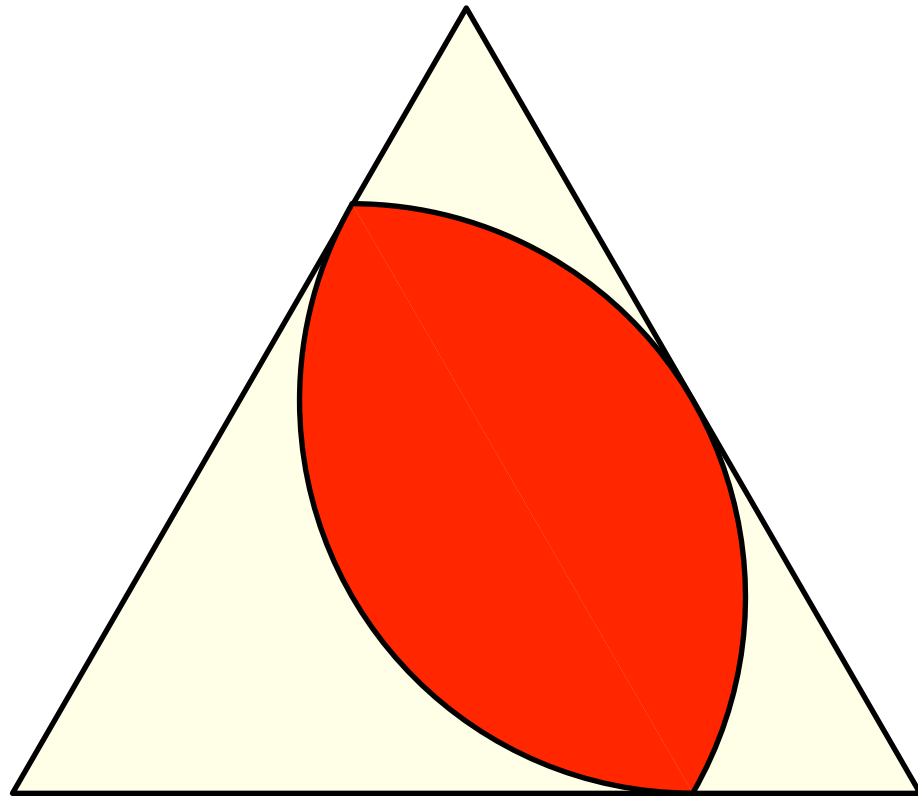
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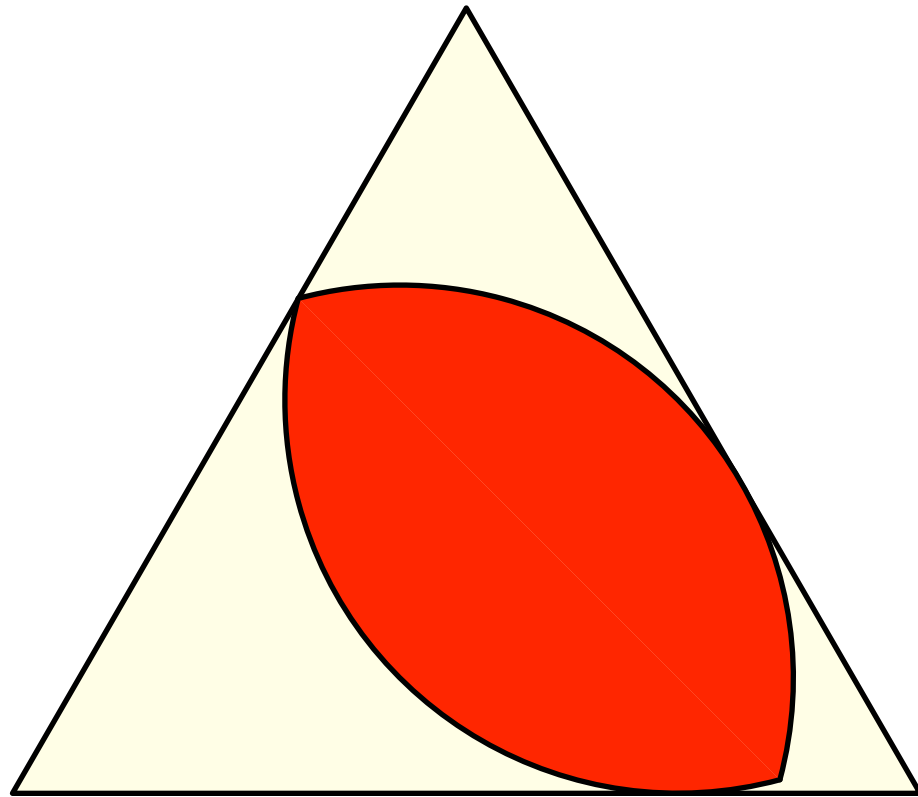
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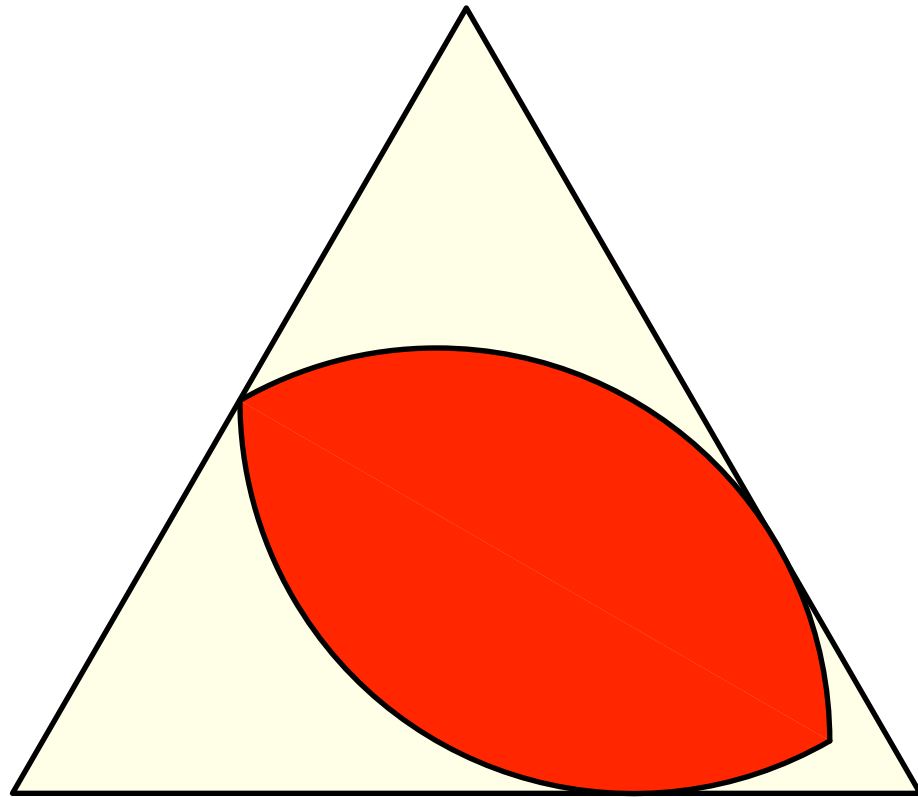
120°-Zweieck



120°-Zweieck

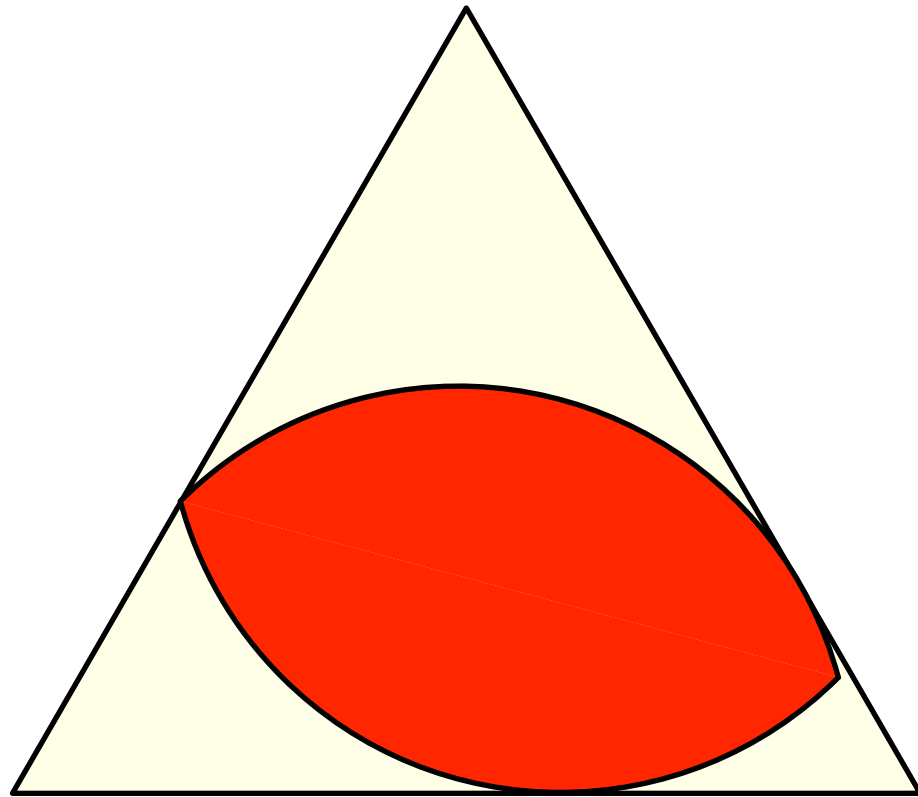


120°-Zweieck

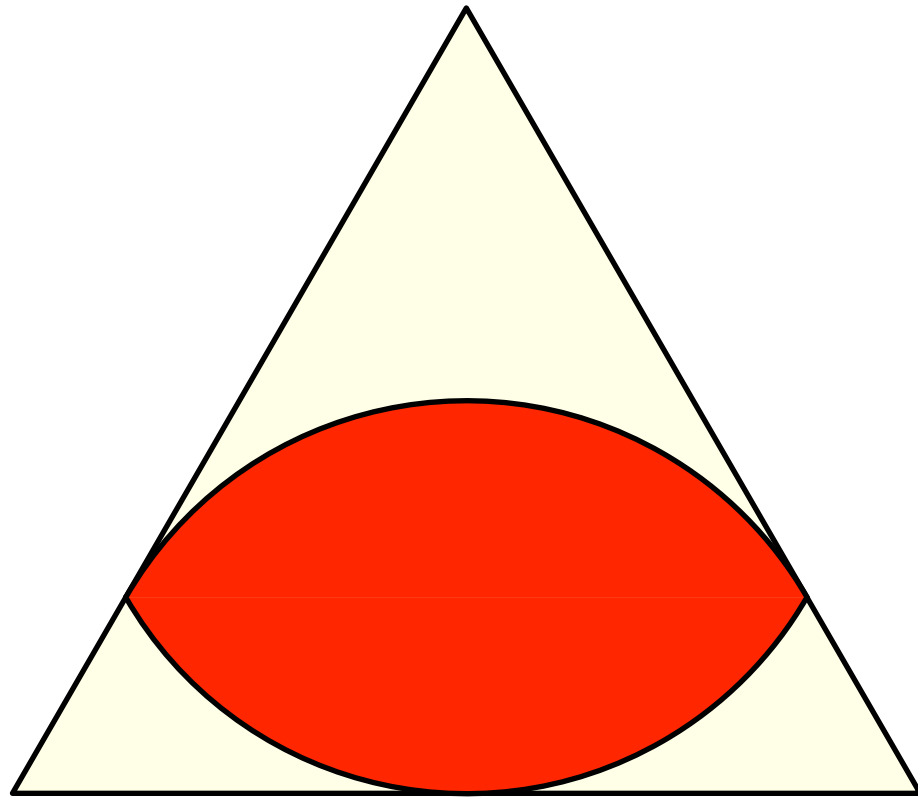




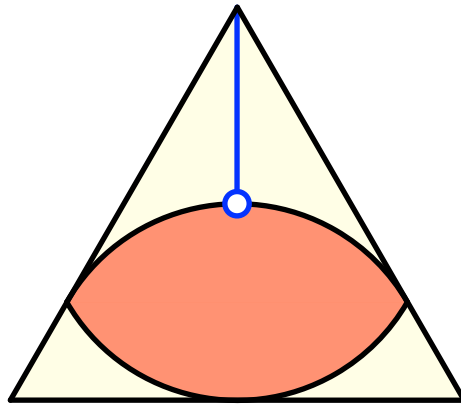
120°-Zweieck



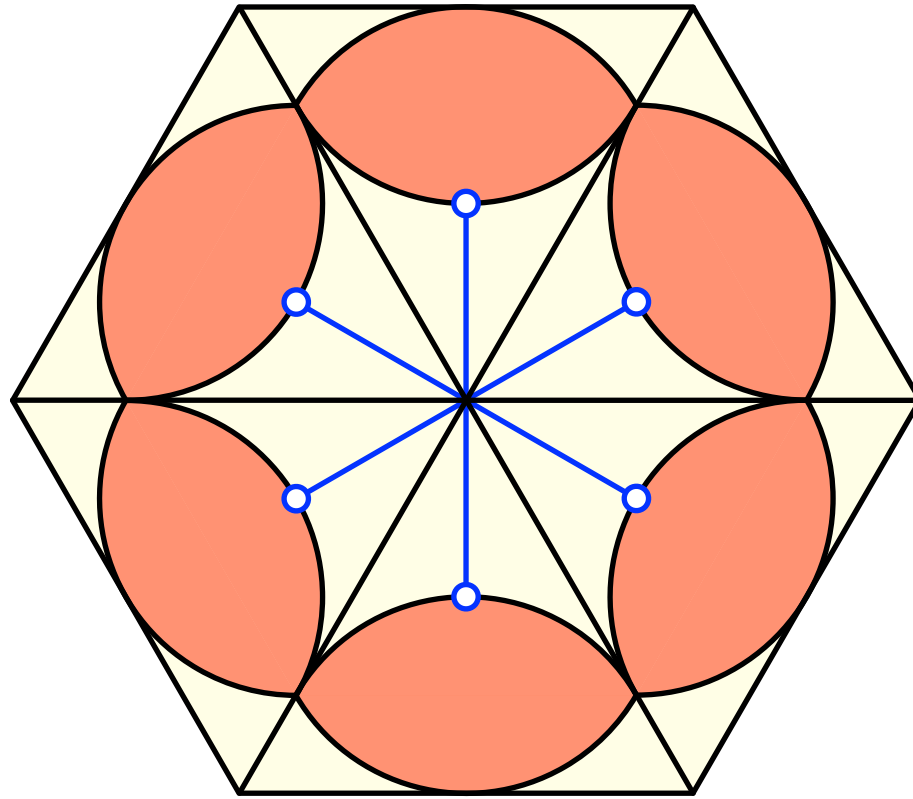
120°-Zweieck



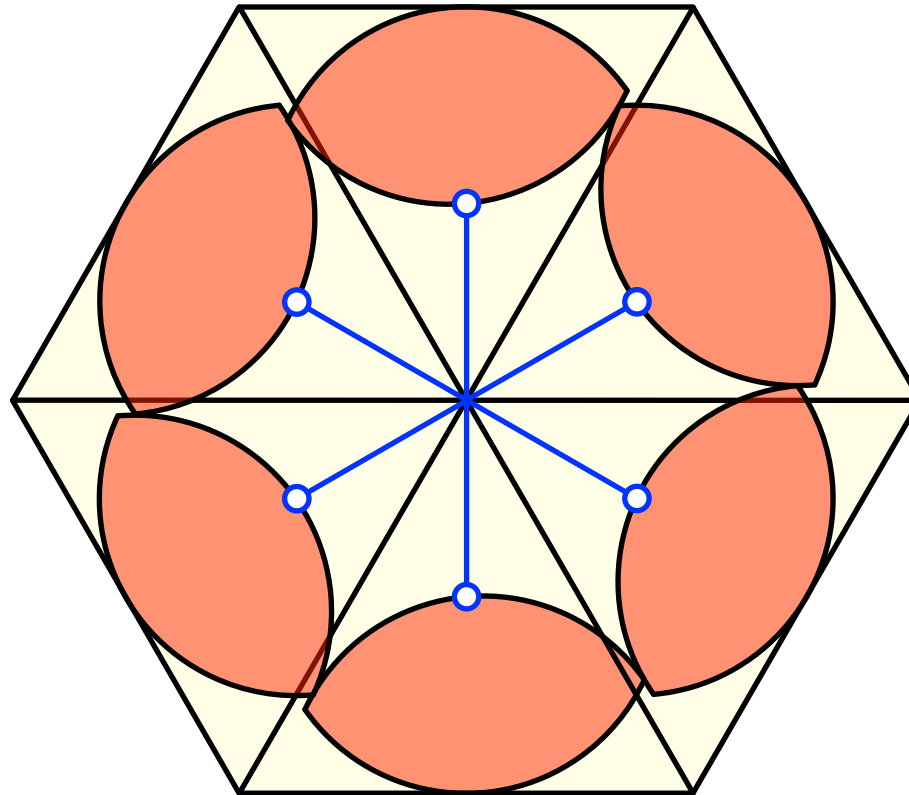
Beweis



Beweis

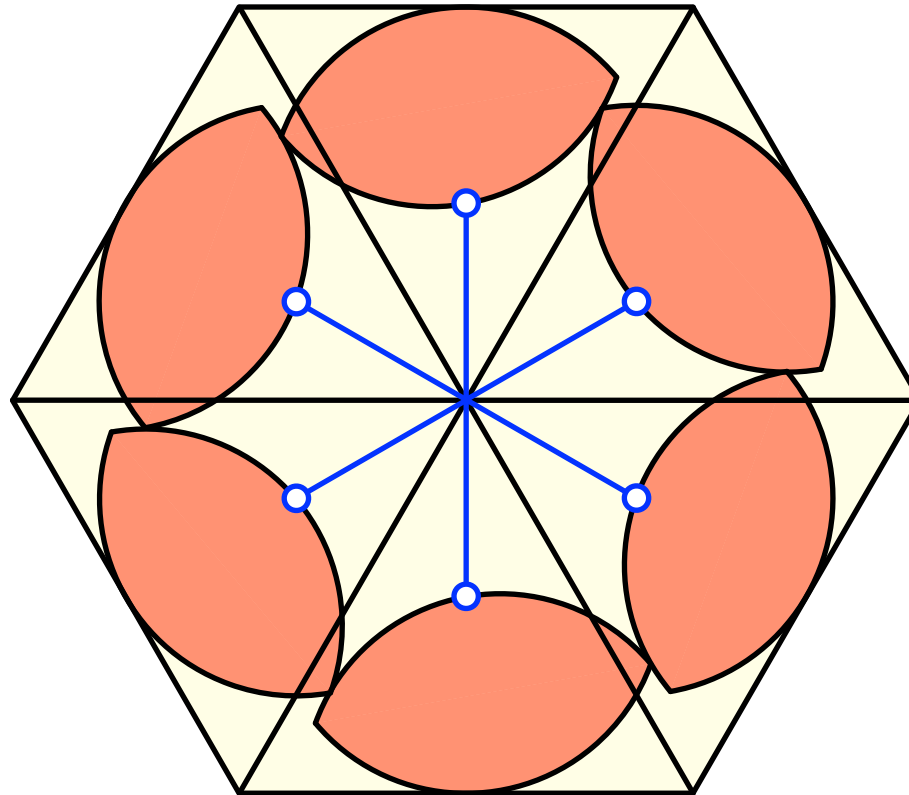


Beweis



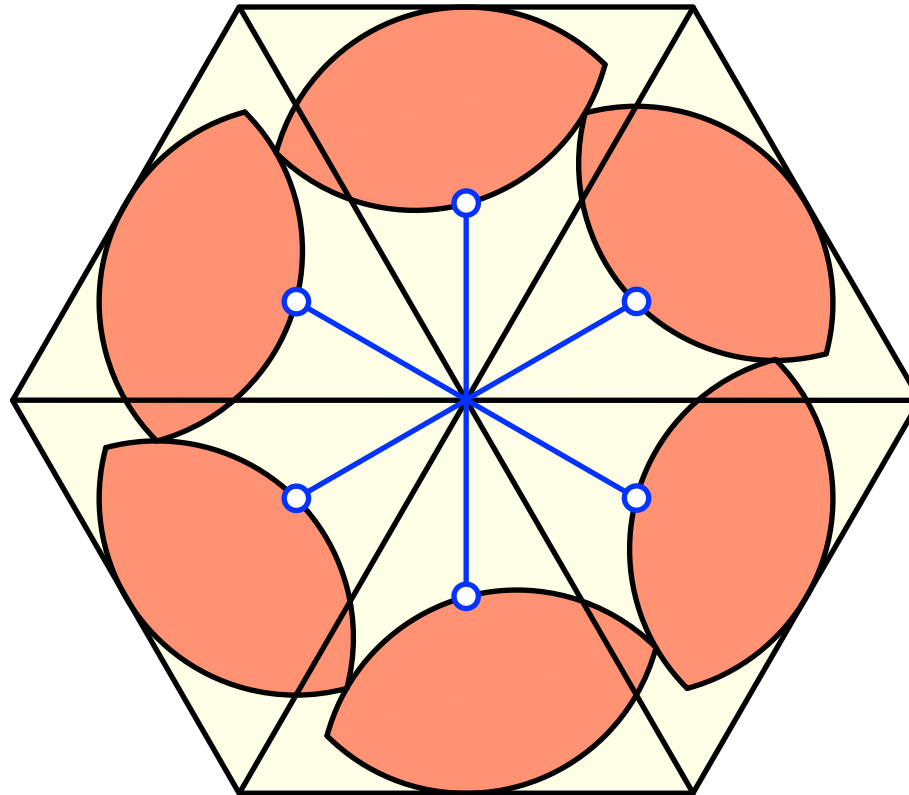
Modell

Beweis



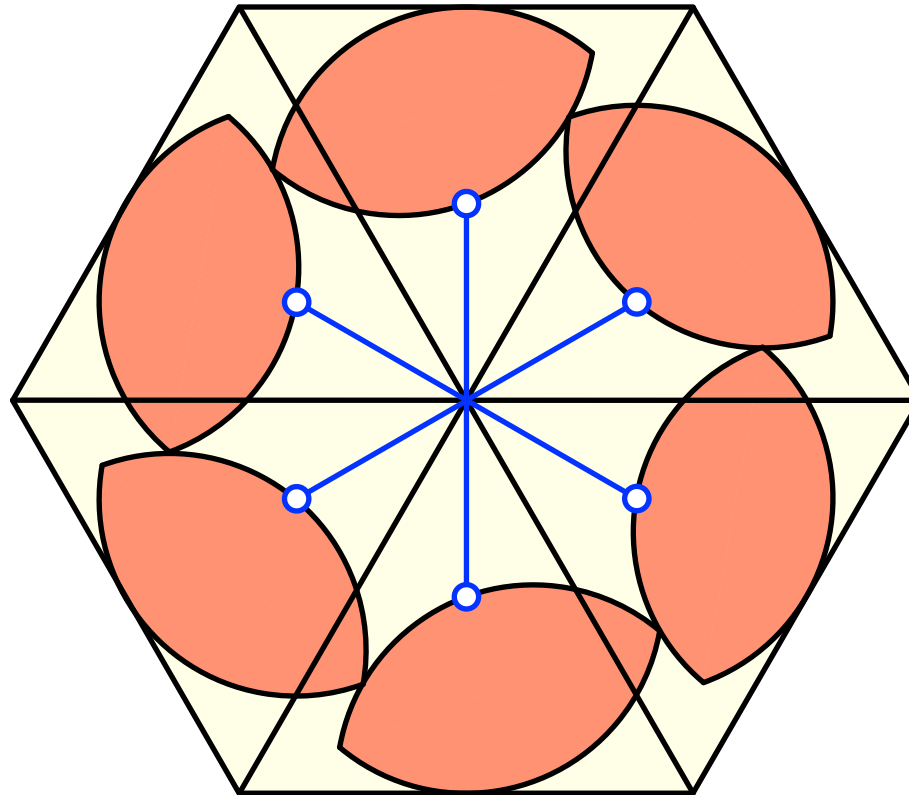
Modell

Beweis



Modell

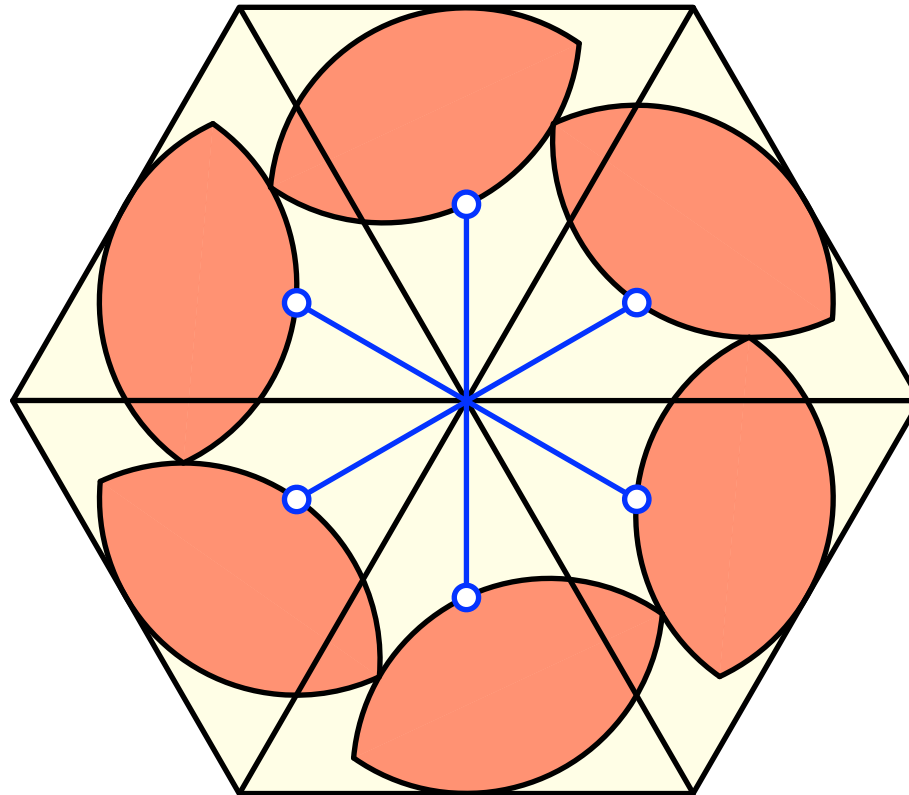
Beweis



Modell

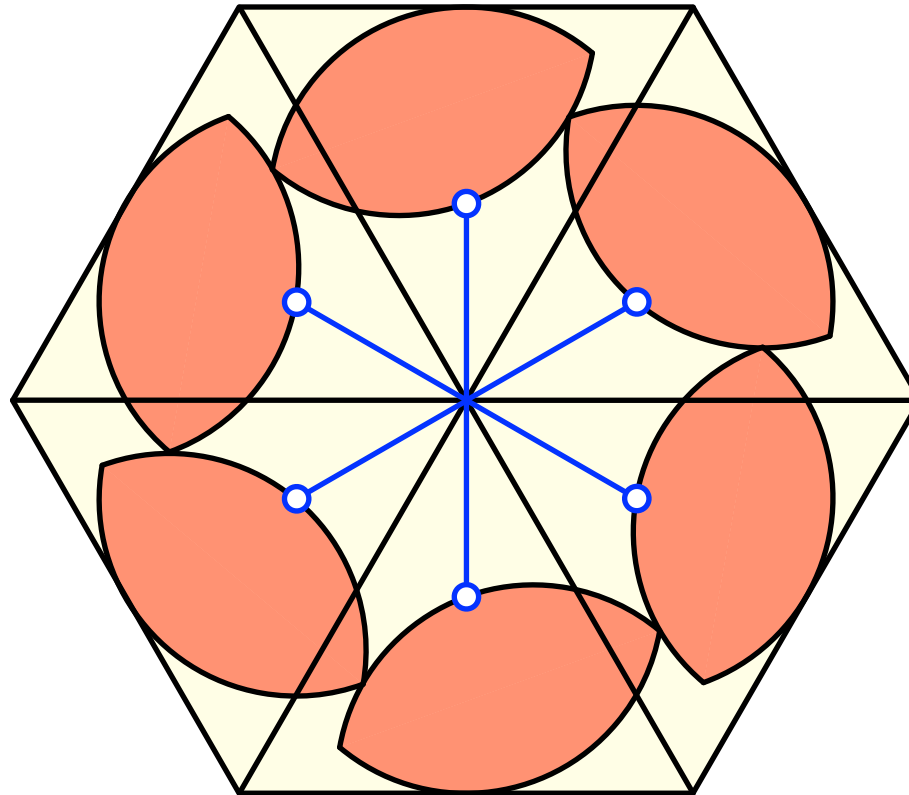


Beweis



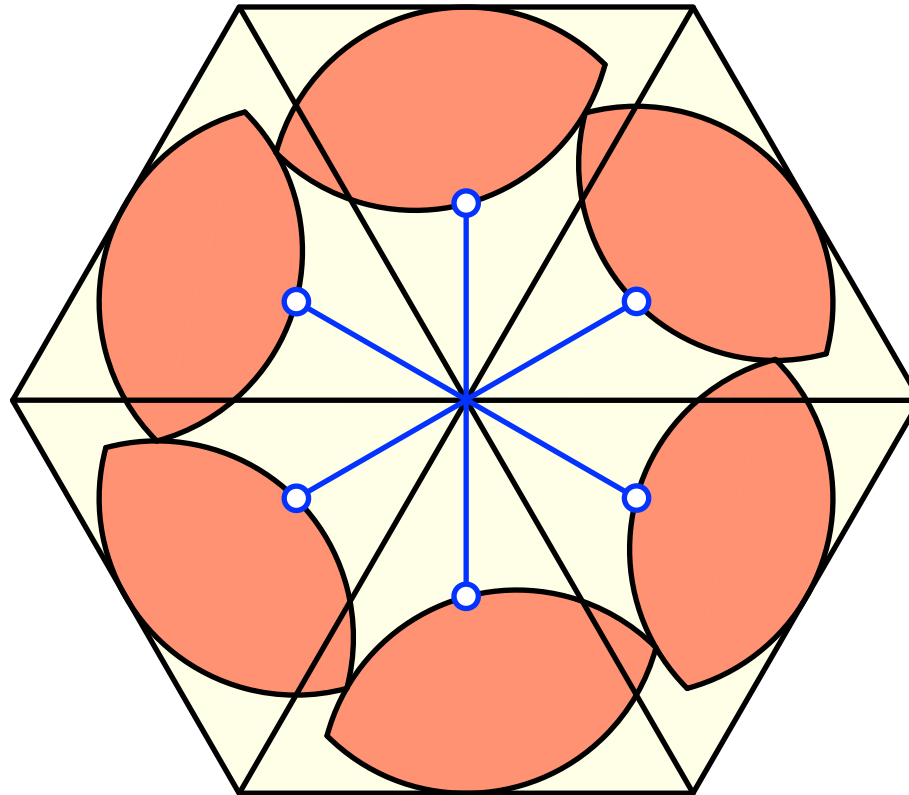
Modell

Beweis



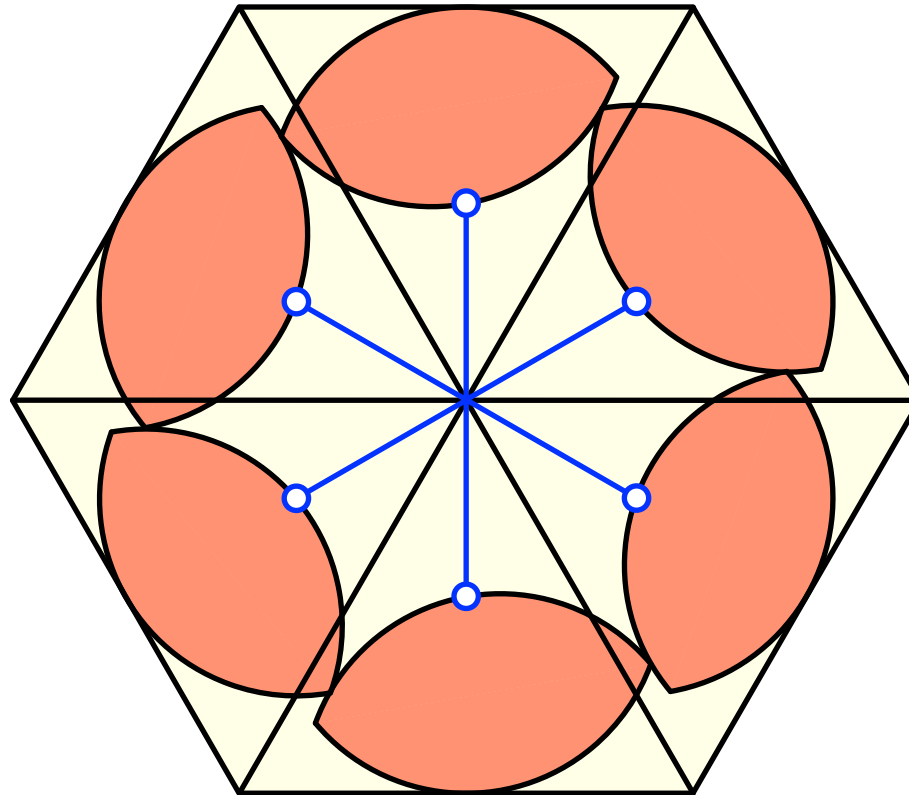
Modell

Beweis



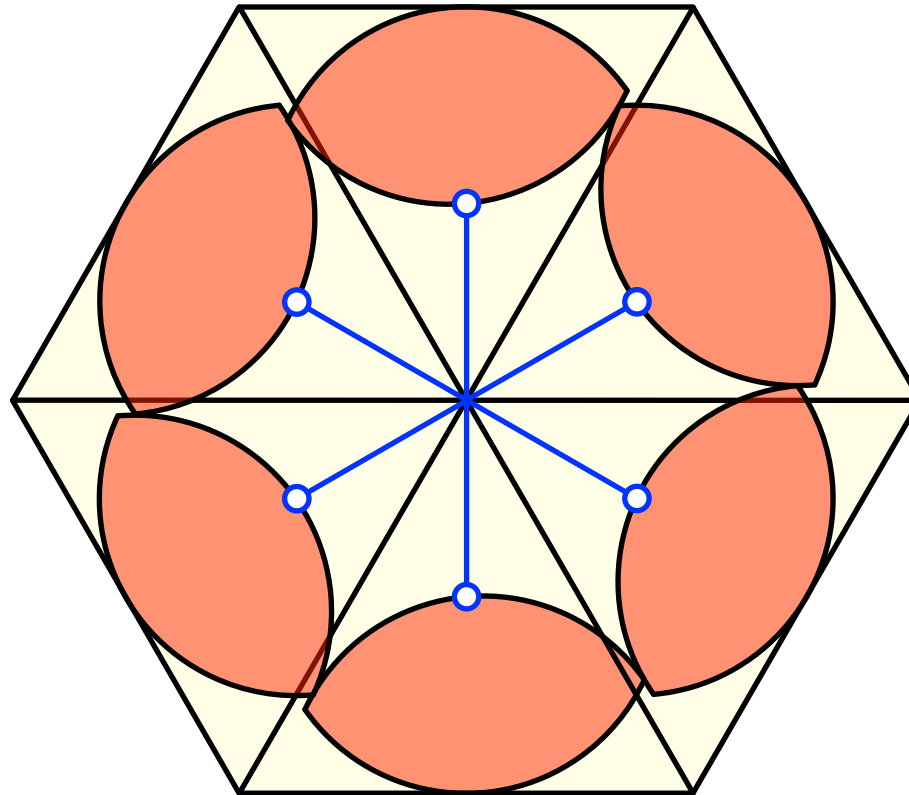
Modell

Beweis



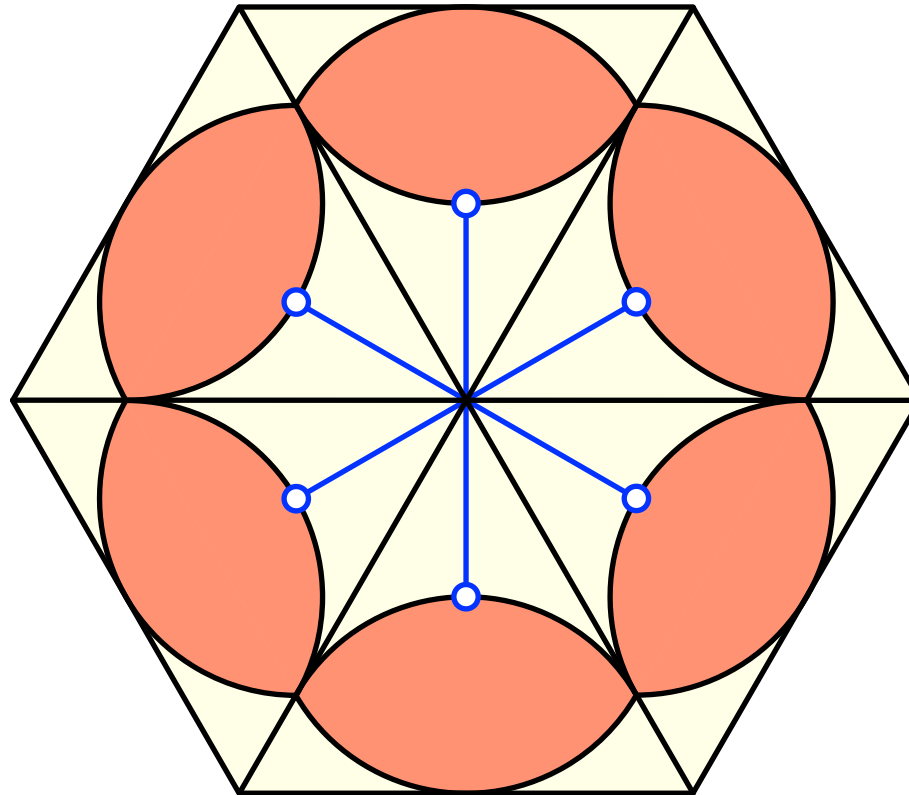
Modell

Beweis



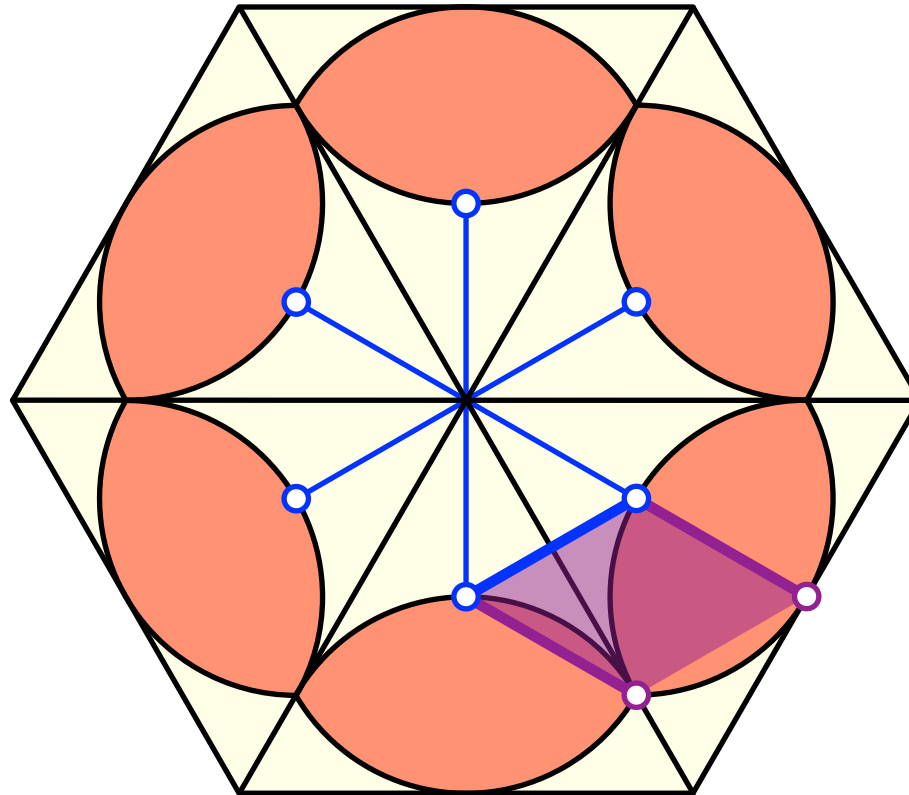
Modell

Beweis



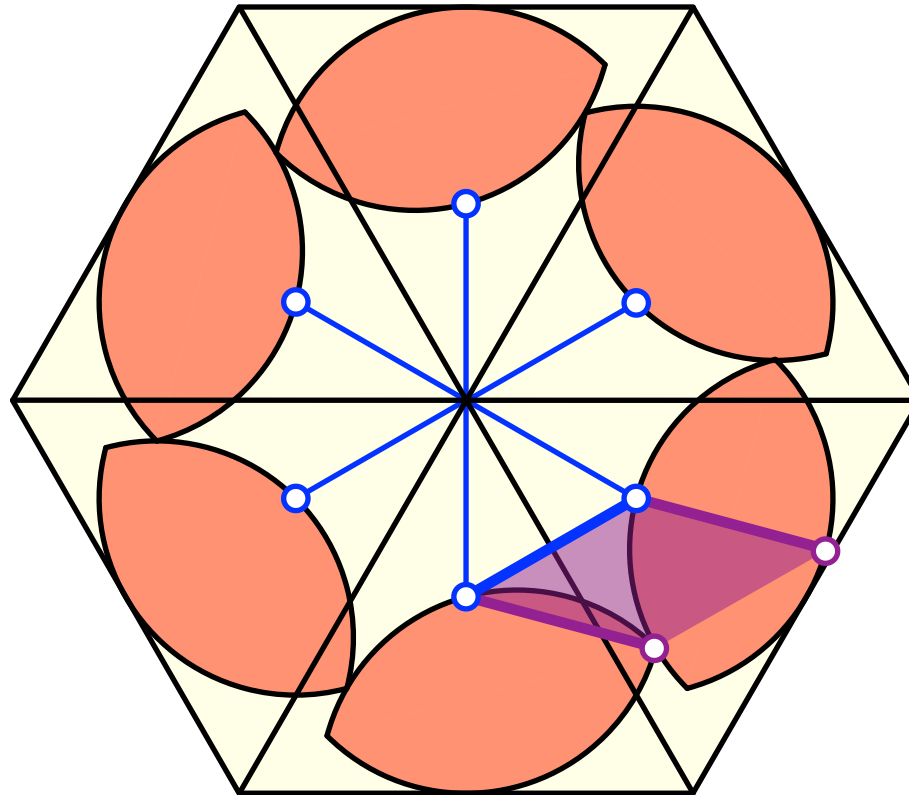
Modell

Beweis



Modell

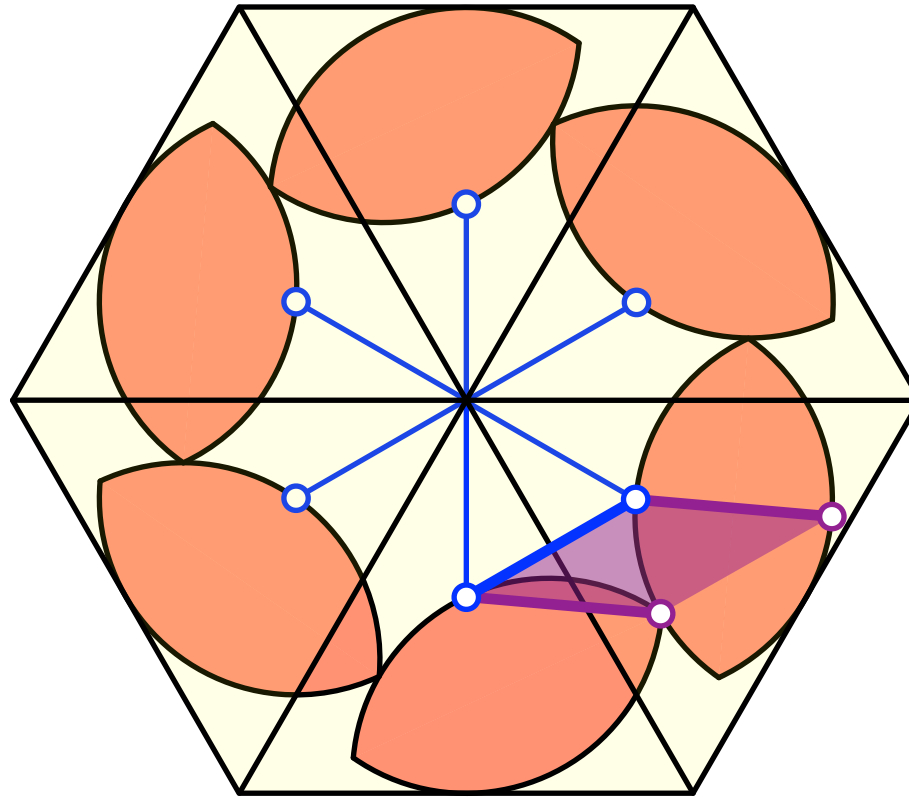
Beweis



Modell

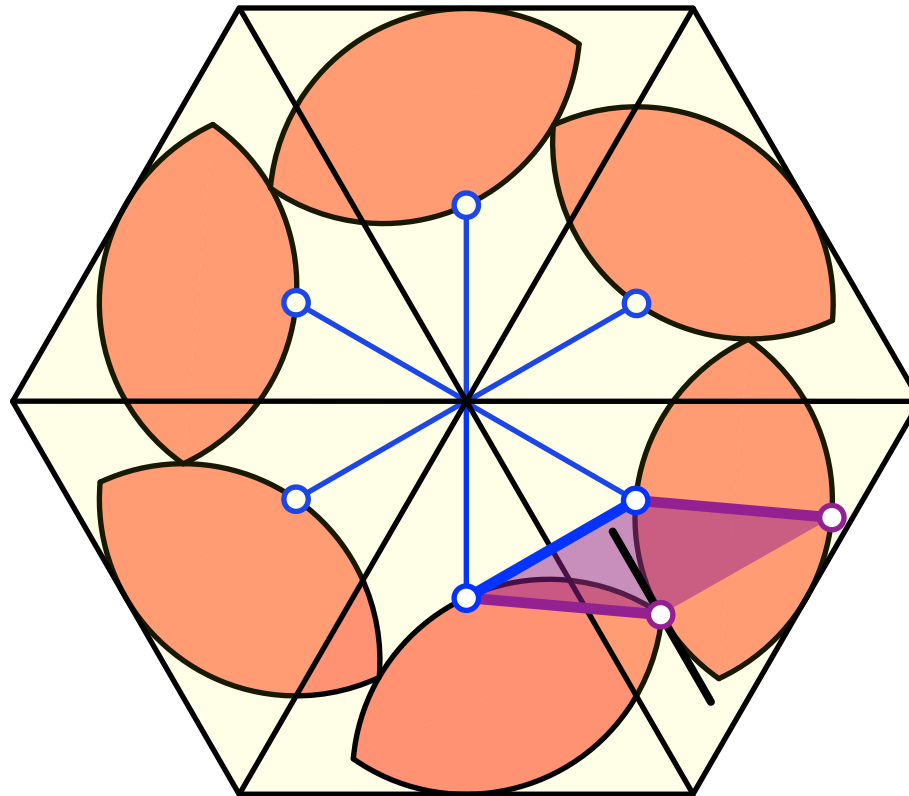


Beweis



Modell

Beweis



Modell

Beweis



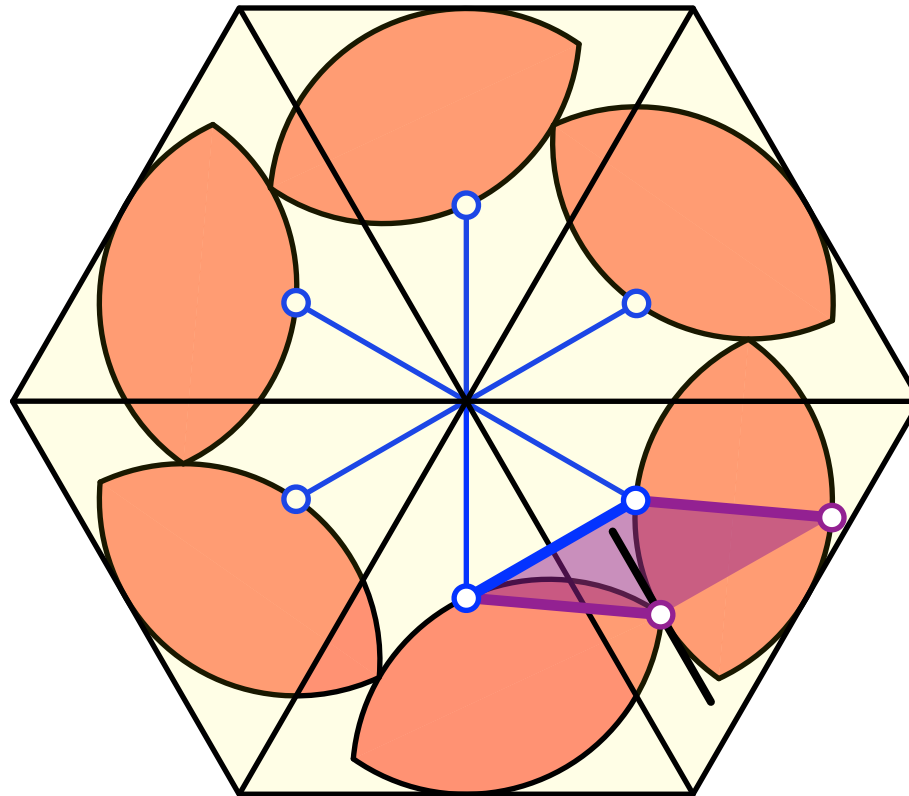
Modell

Beweis



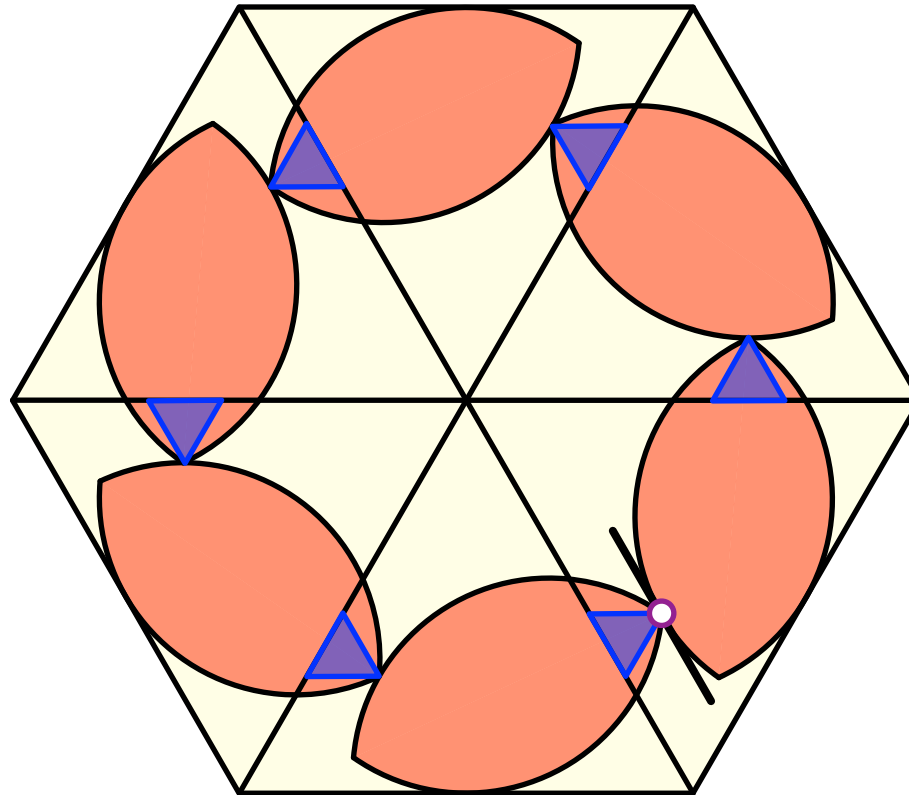
Modell

Beweis



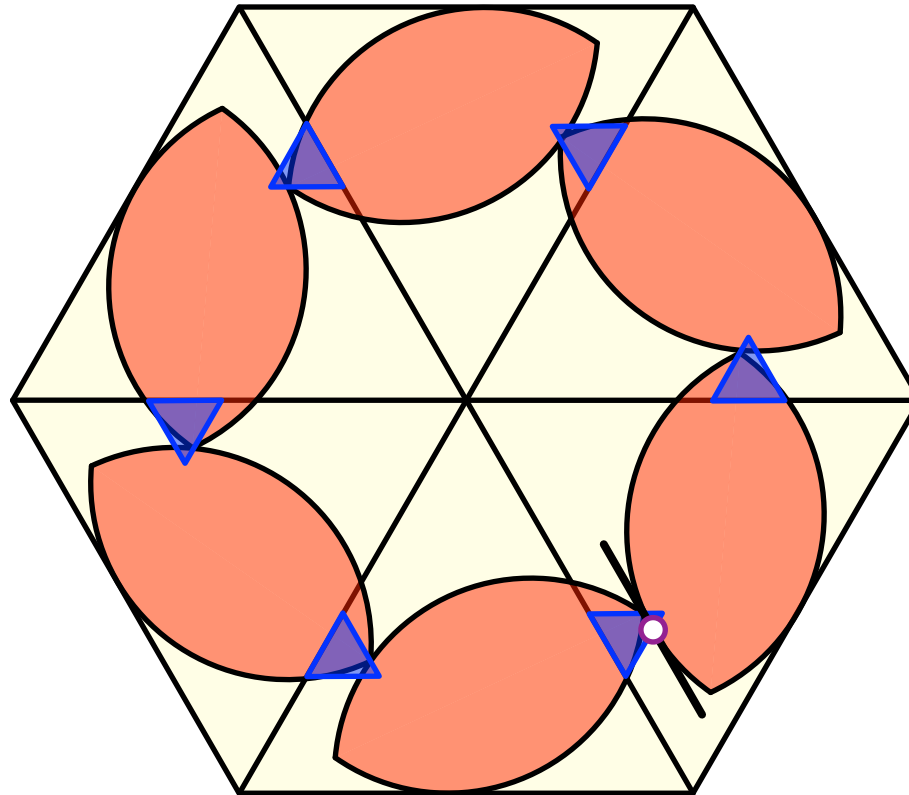
Modell

Beweis

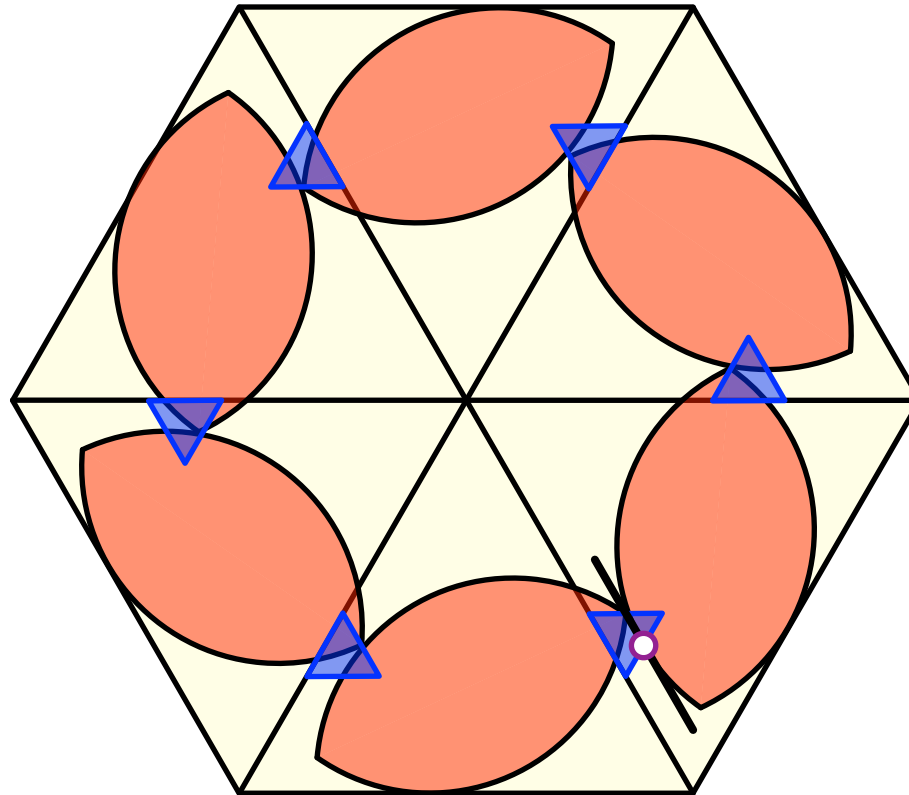


Modell

Beweis

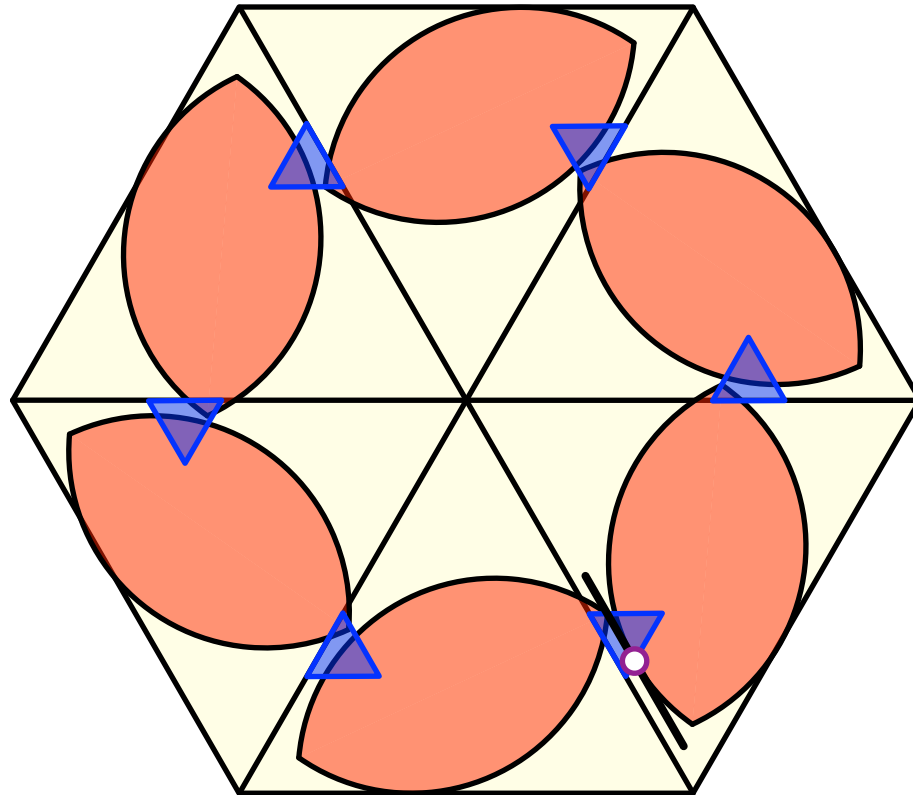


Beweis

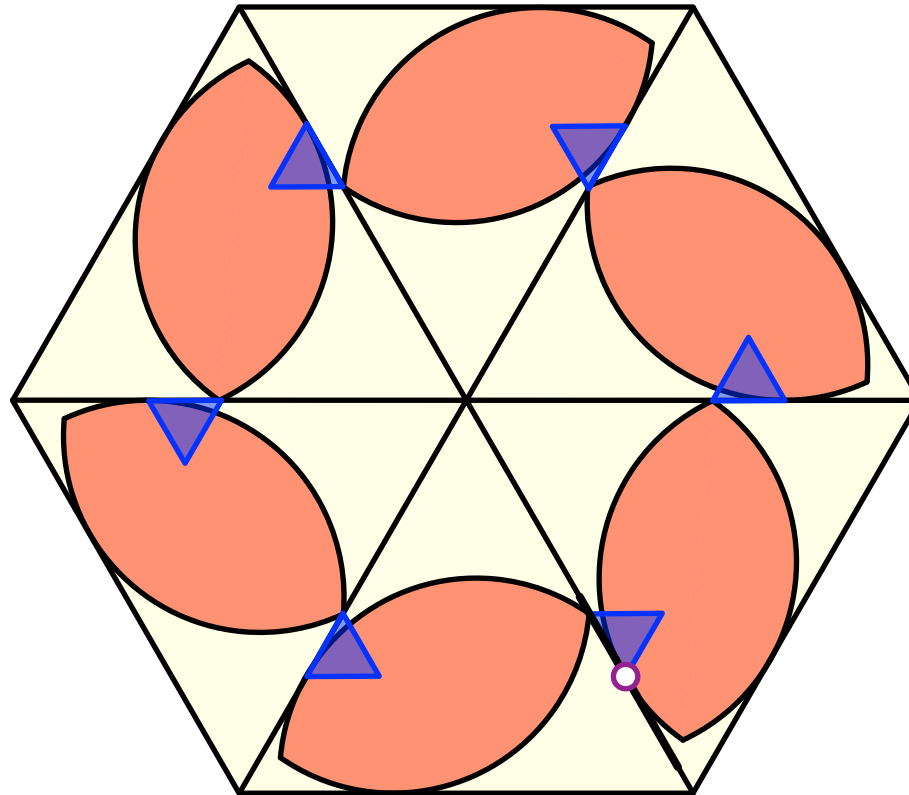




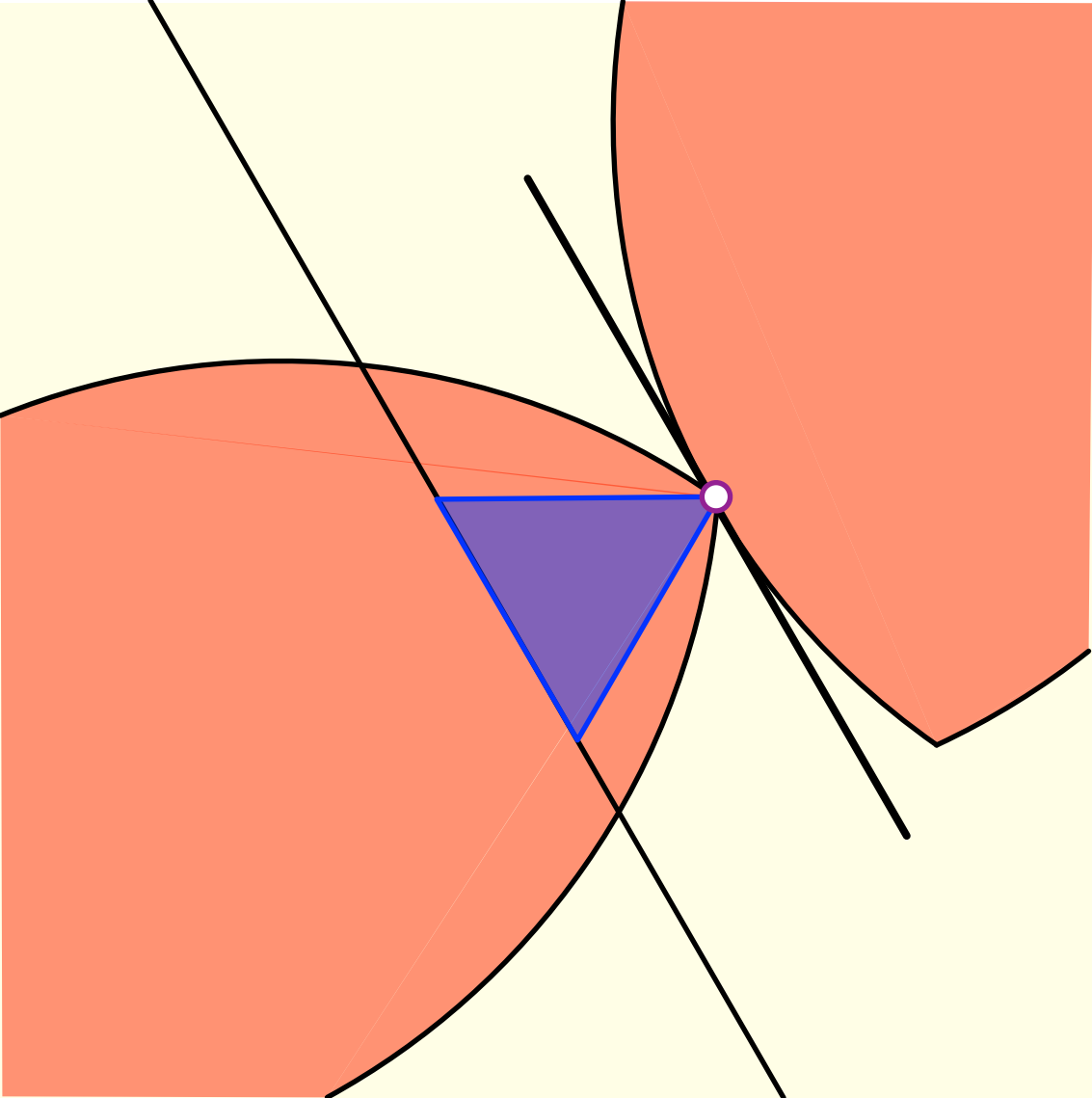
Beweis



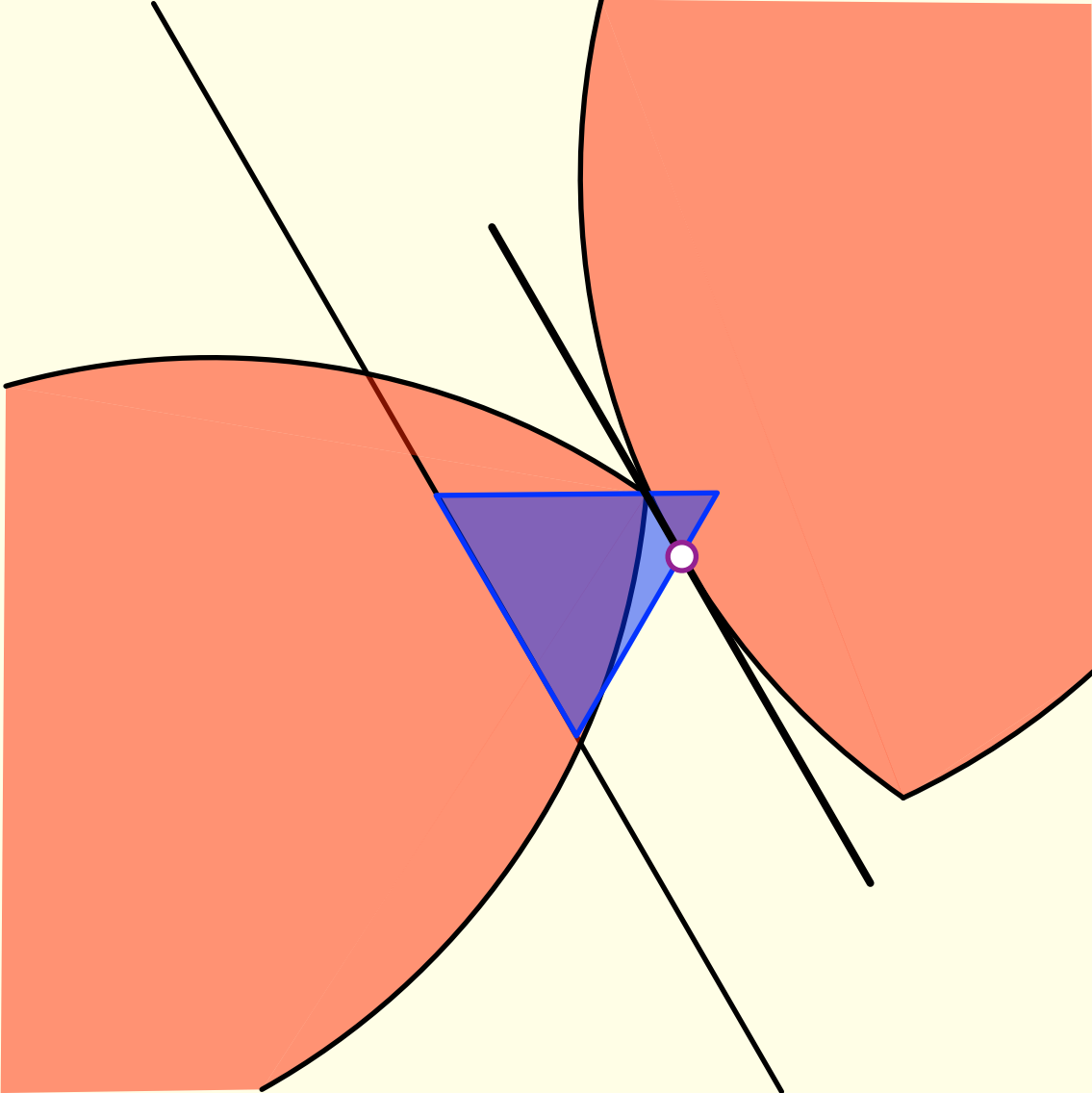
Beweis



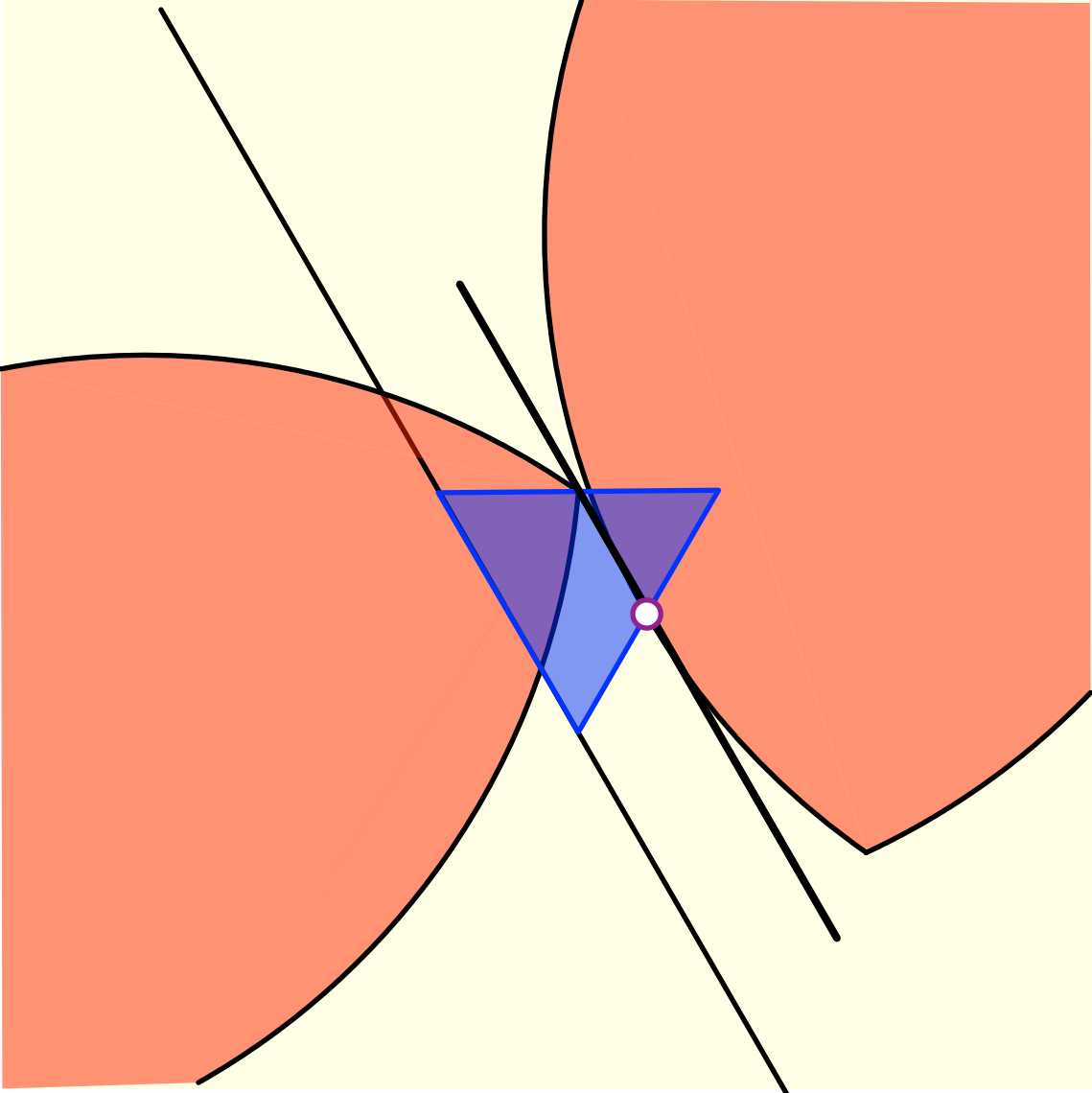
Zoom



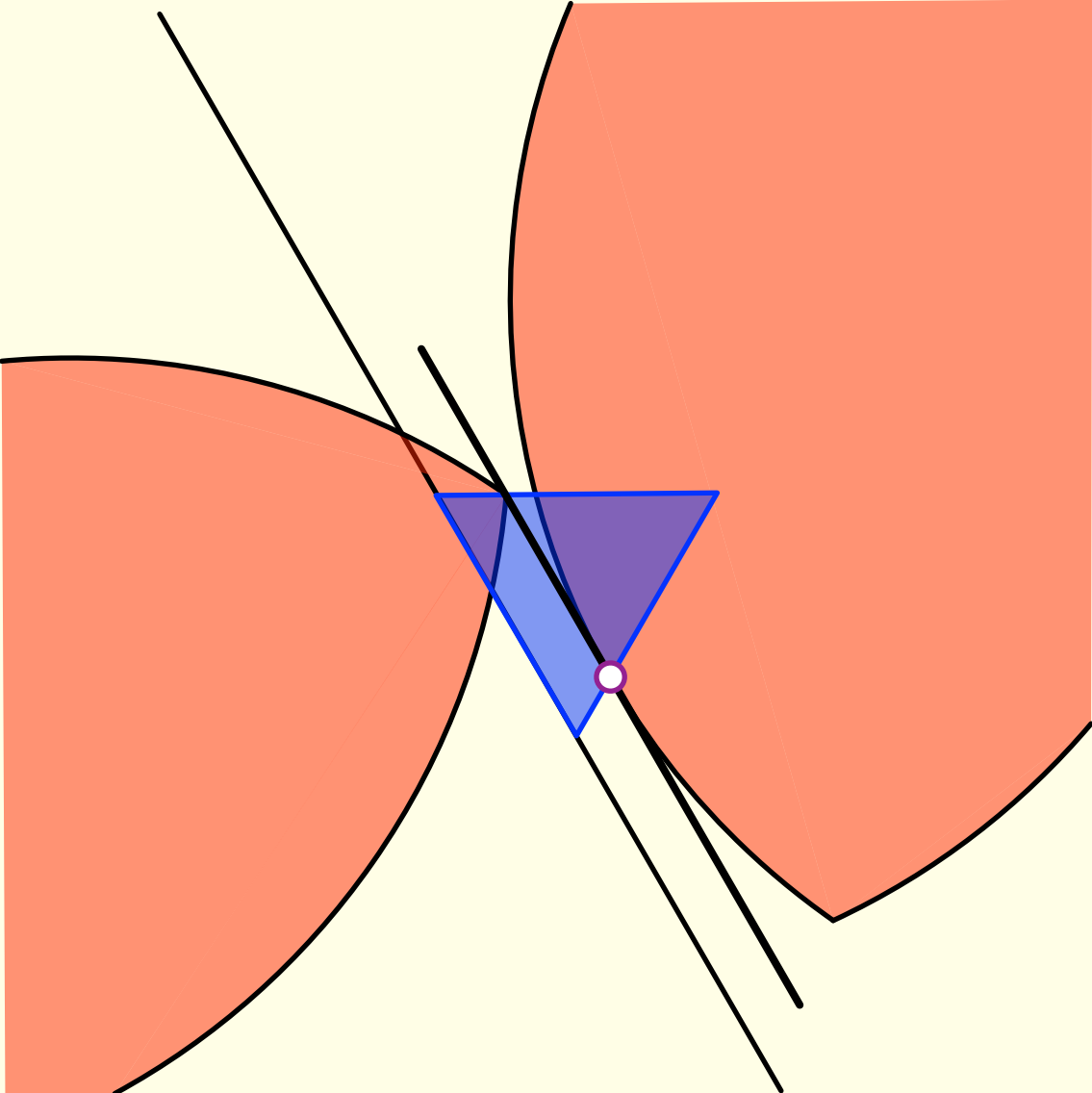
Zoom



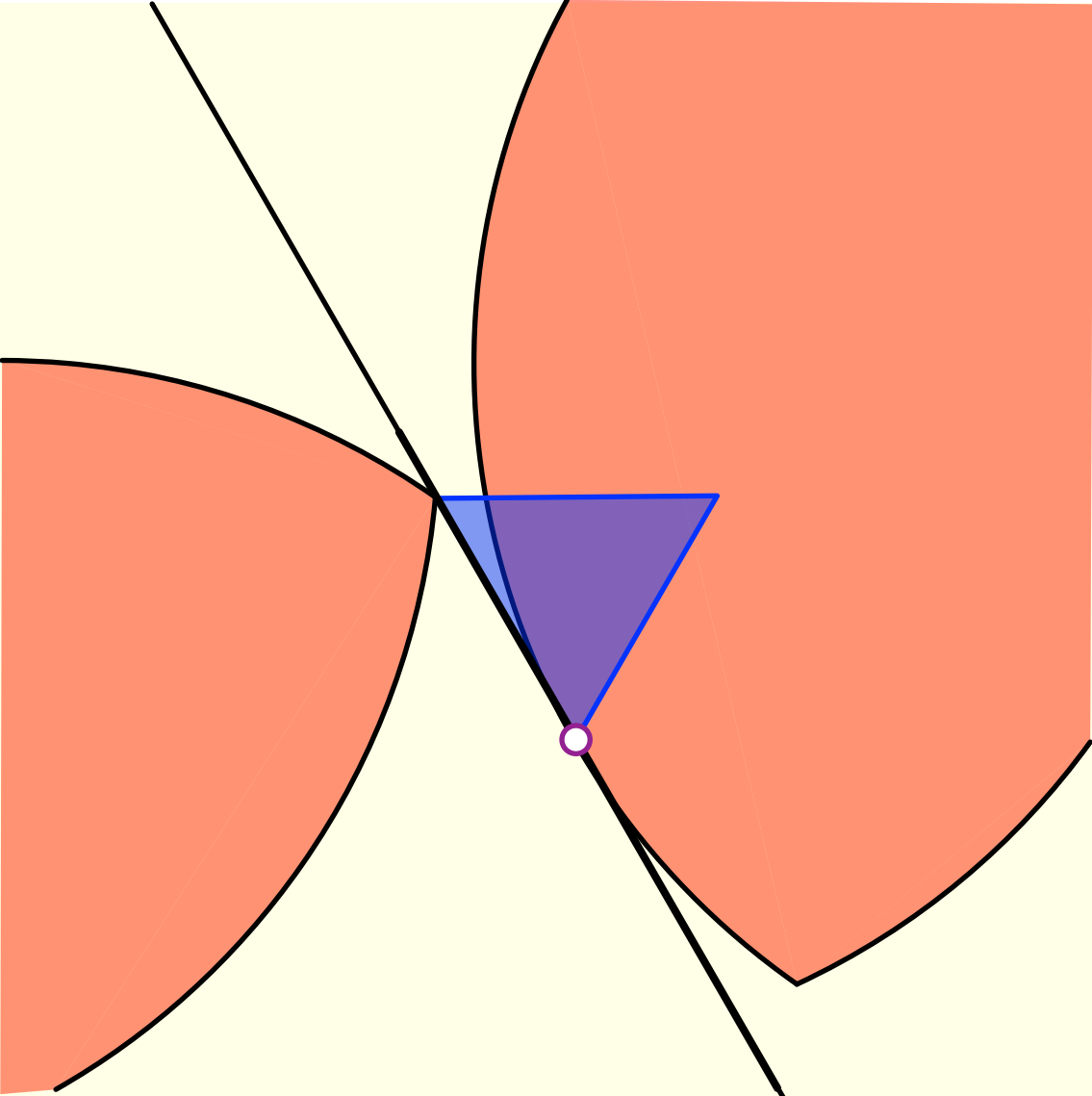
Zoom



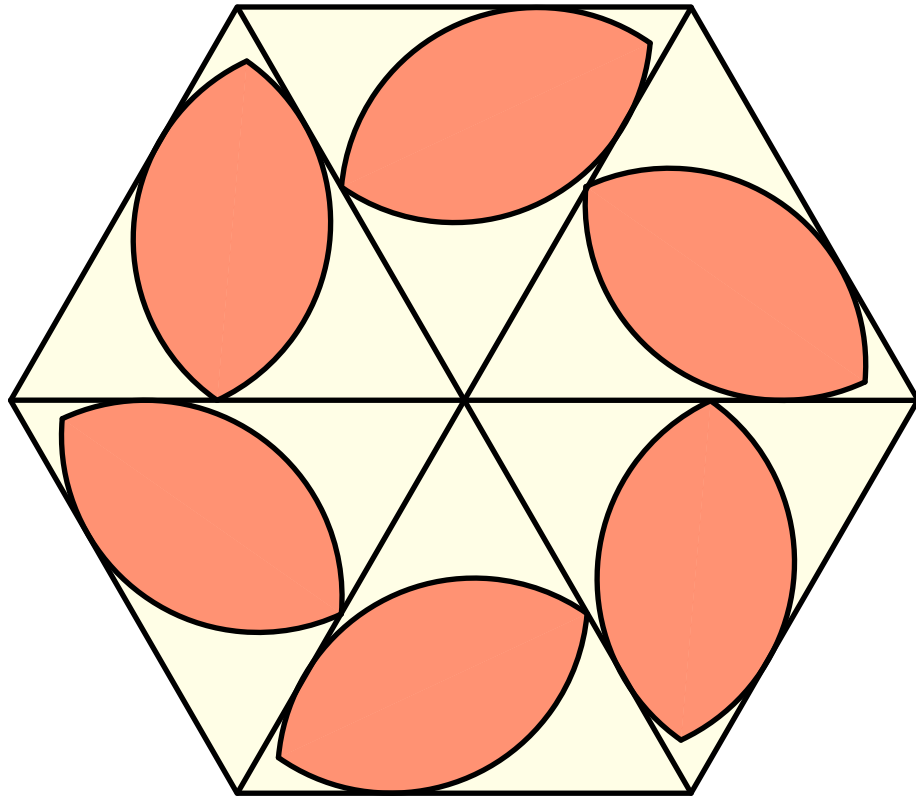
Zoom



Zoom

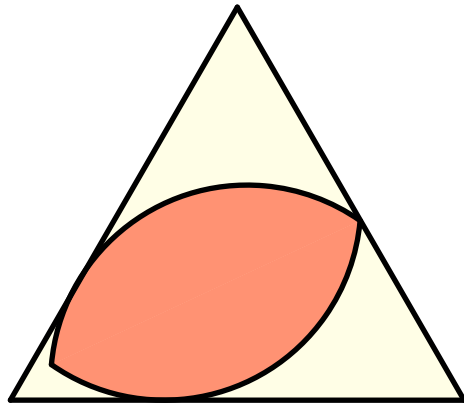


Beweis

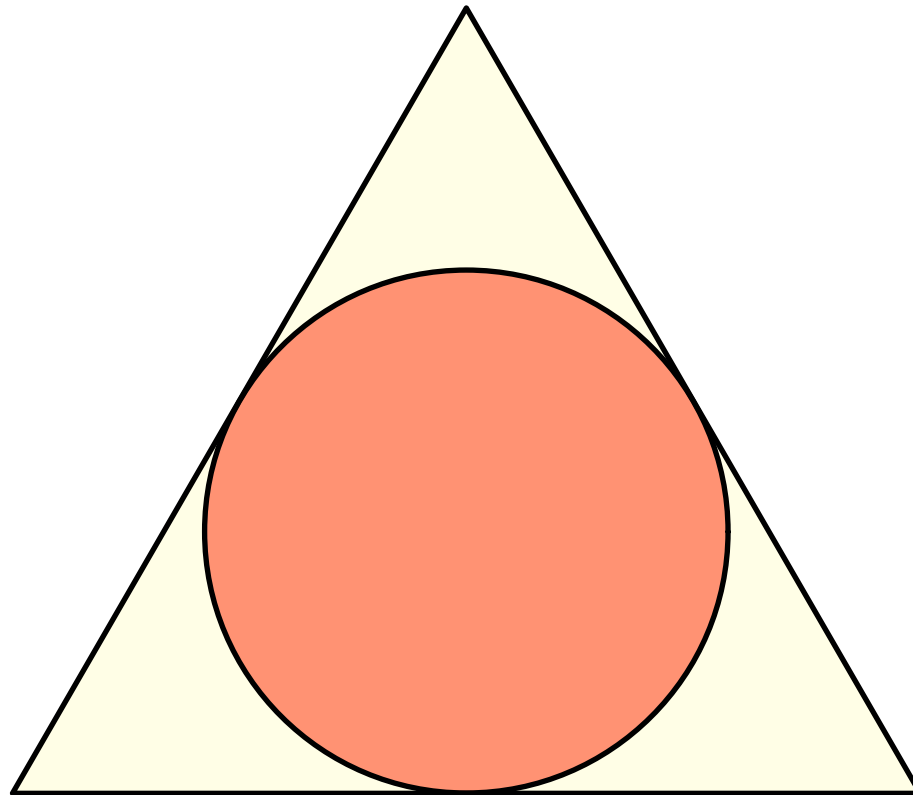




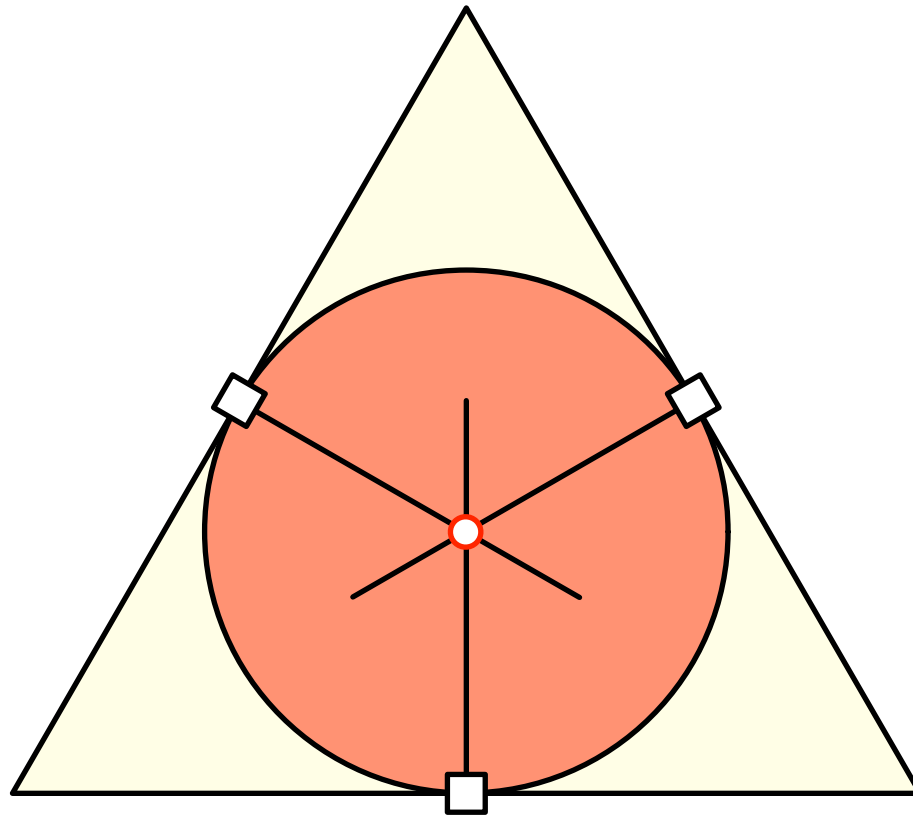
Beweis



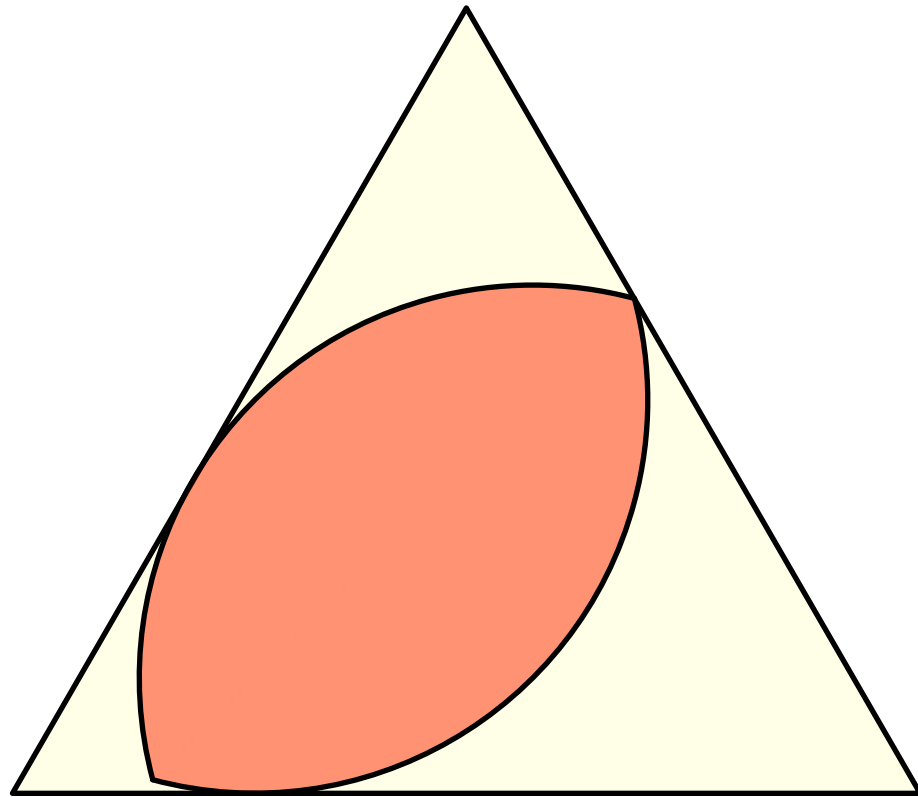
180°-“Zweieck“: Inkreis



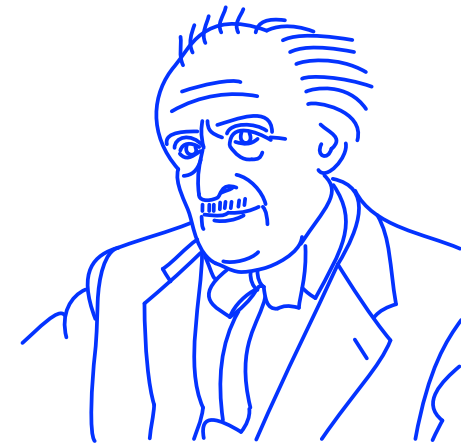
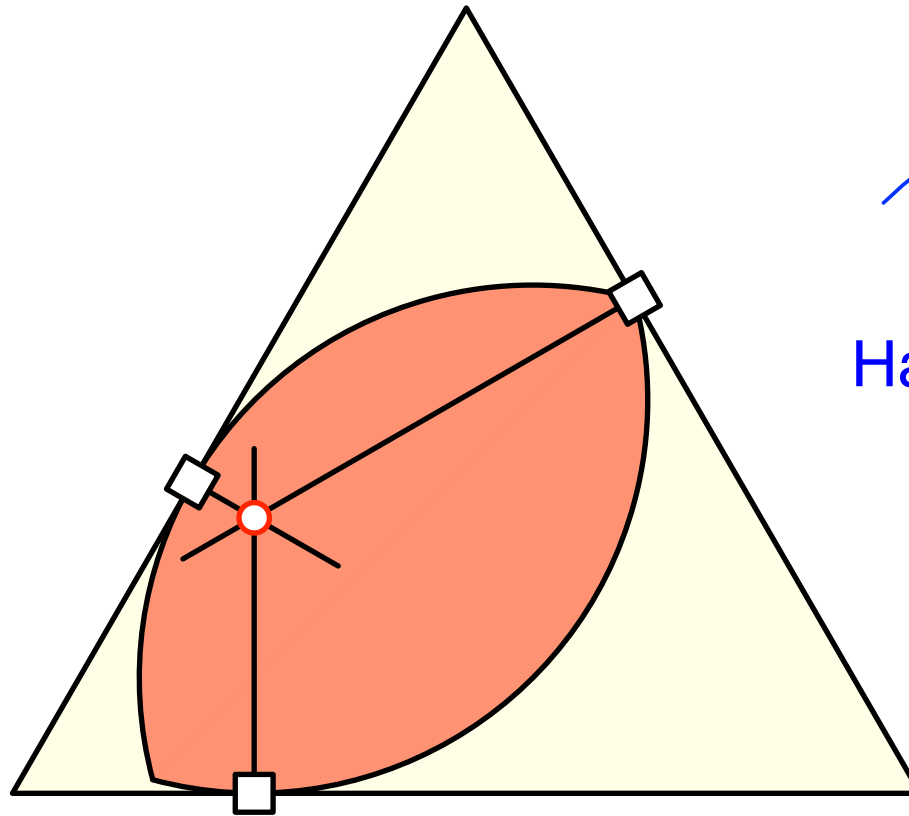
180°-“Zweieck“: Inkreis



120°-Zweieck



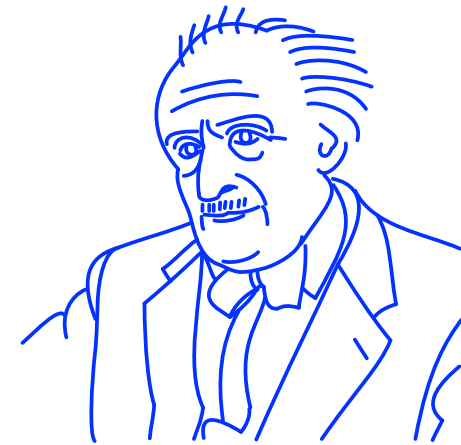
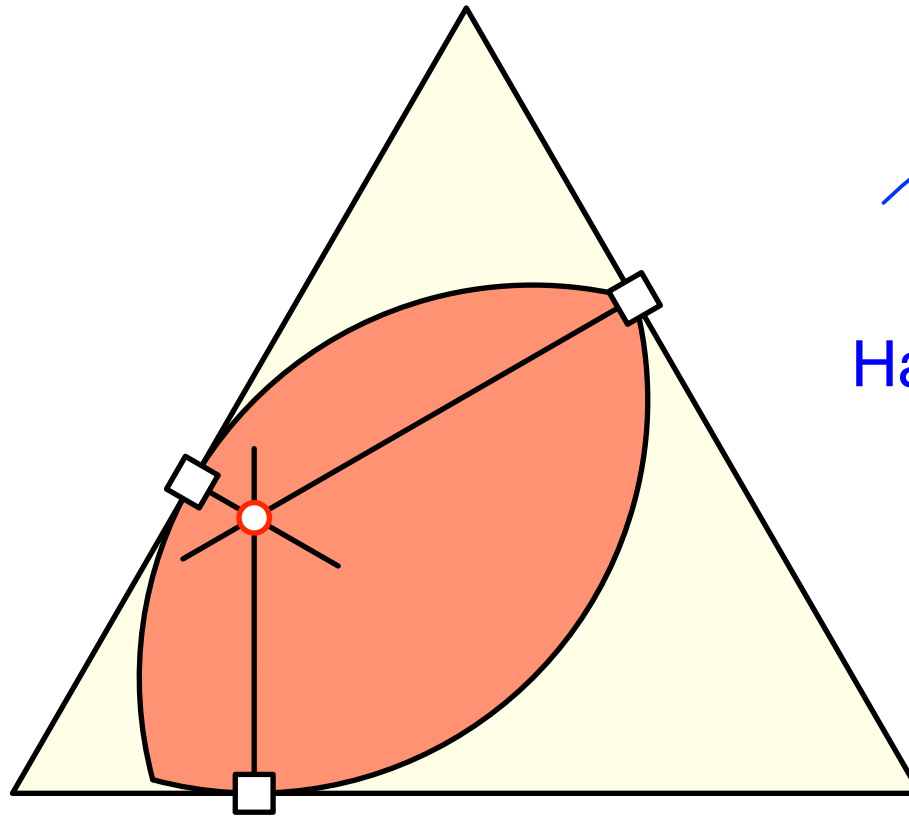
120°-Zweieck



Hans Freudenthal  
1905-1990

120°-Zweieck

Momentaner Drehpunkt



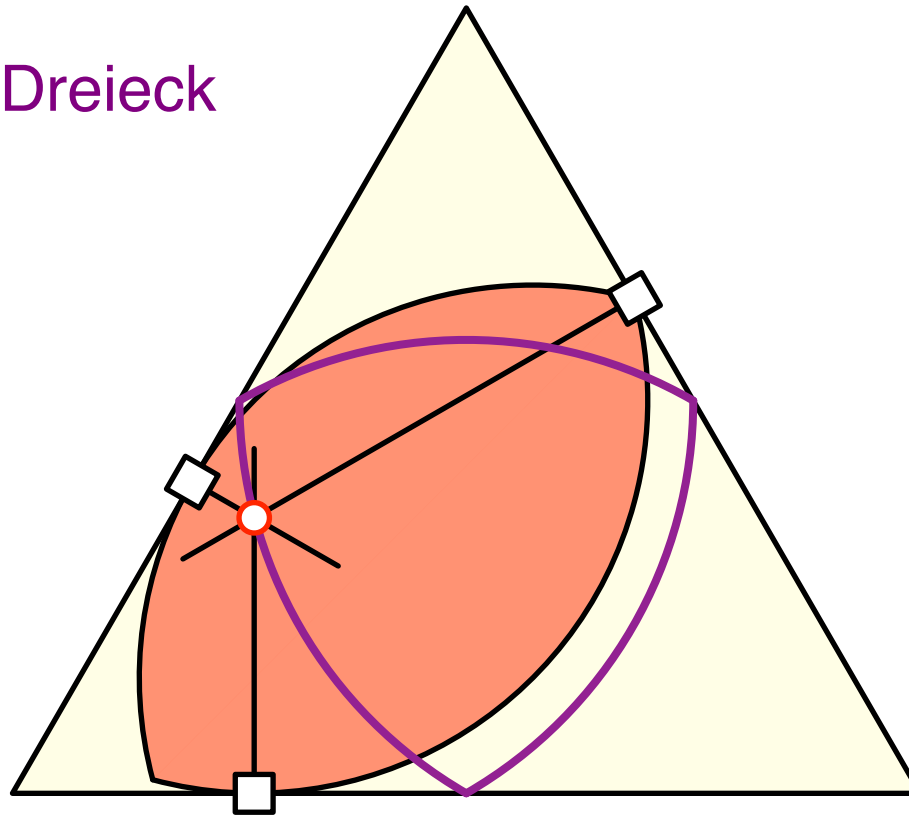
Hans Freudenthal  
1905-1990

120°-Zweieck

Momentaner Drehpunkt

Ortslinie

relativ zum Dreieck

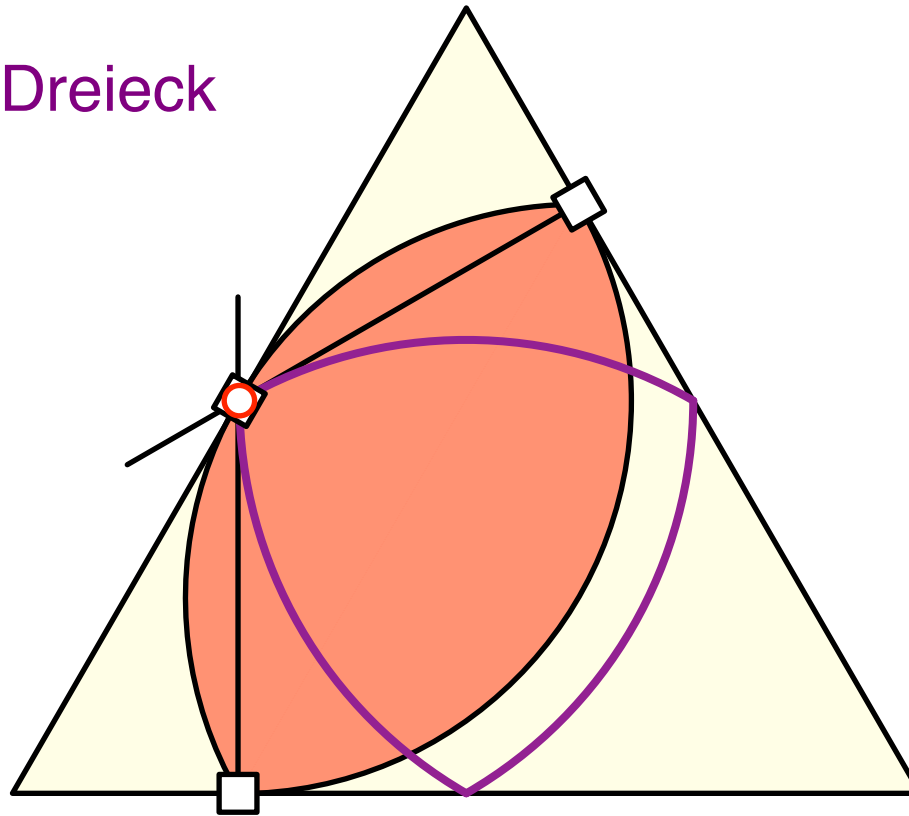


120°-Zweieck

Momentaner Drehpunkt

Ortslinie

relativ zum Dreieck



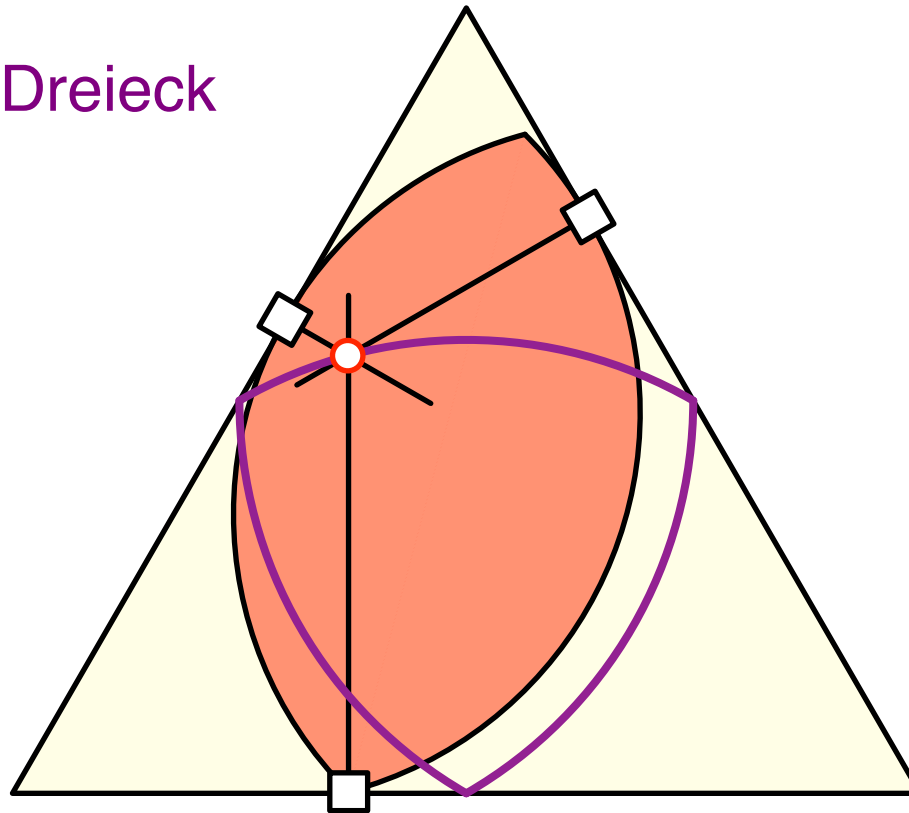


120°-Zweieck

Momentaner Drehpunkt

Ortslinie

relativ zum Dreieck

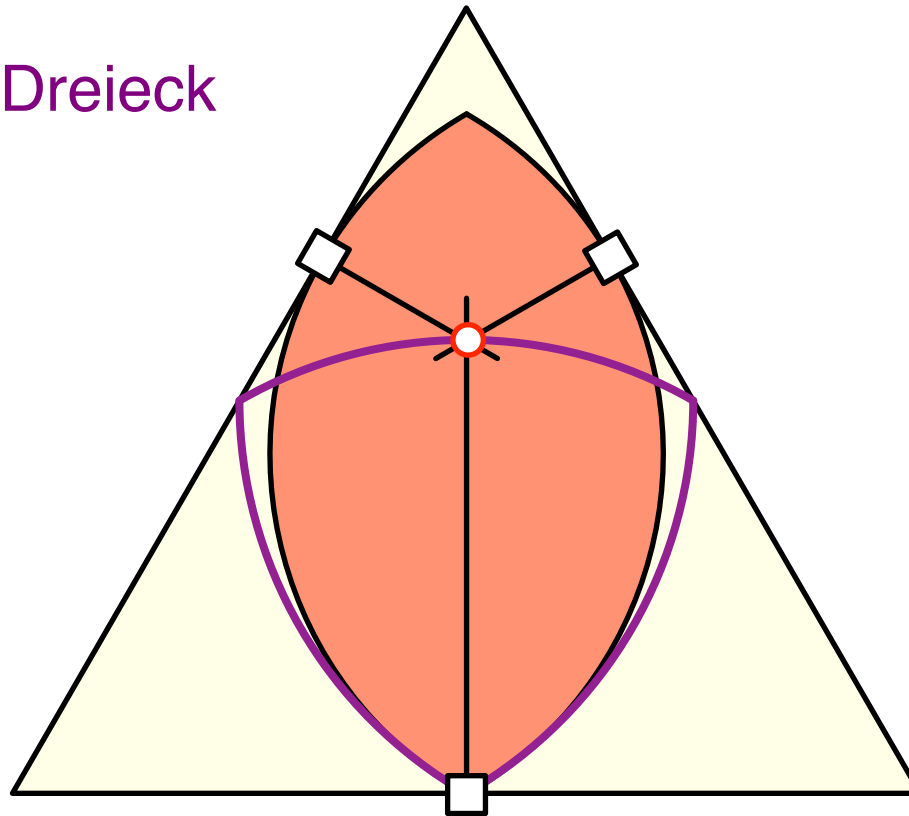


120°-Zweieck

Momentaner Drehpunkt

Ortslinie

relativ zum Dreieck

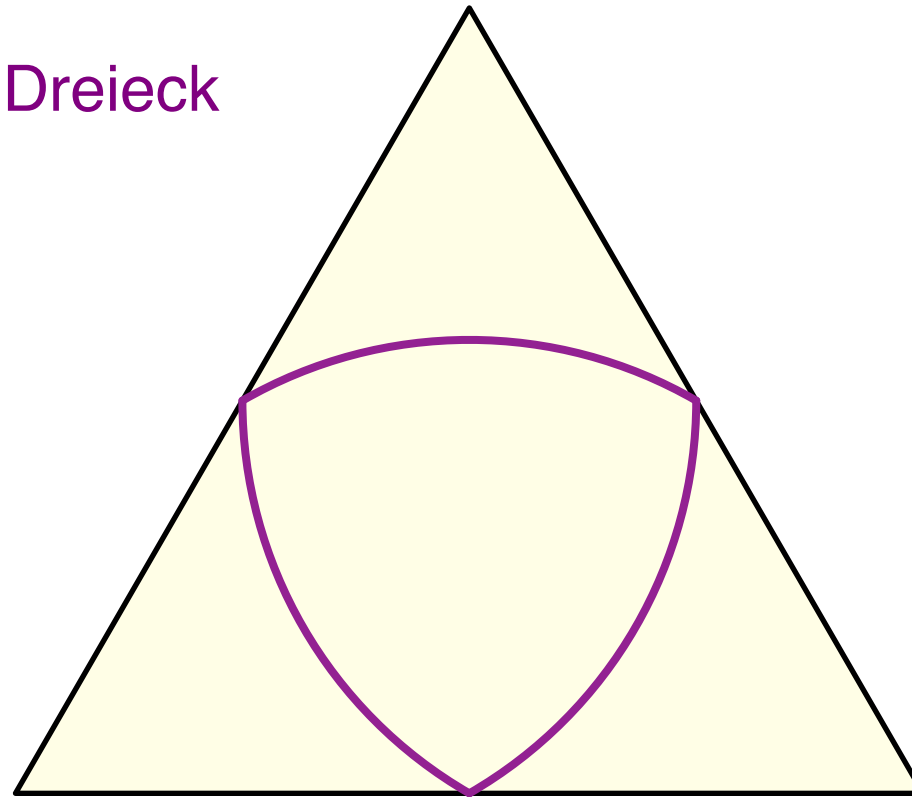


120°-Zweieck

Momentaner Drehpunkt

Ortslinie

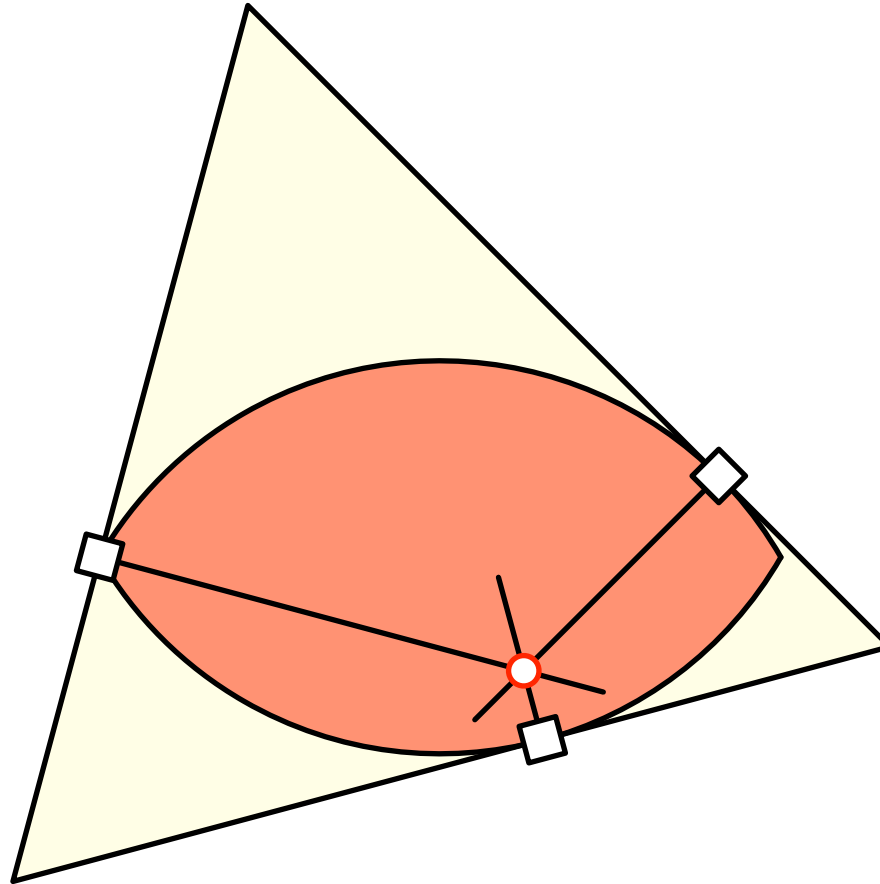
relativ zum Dreieck



Reuleaux-Dreieck

120°-Zweieck

Momentaner Drehpunkt

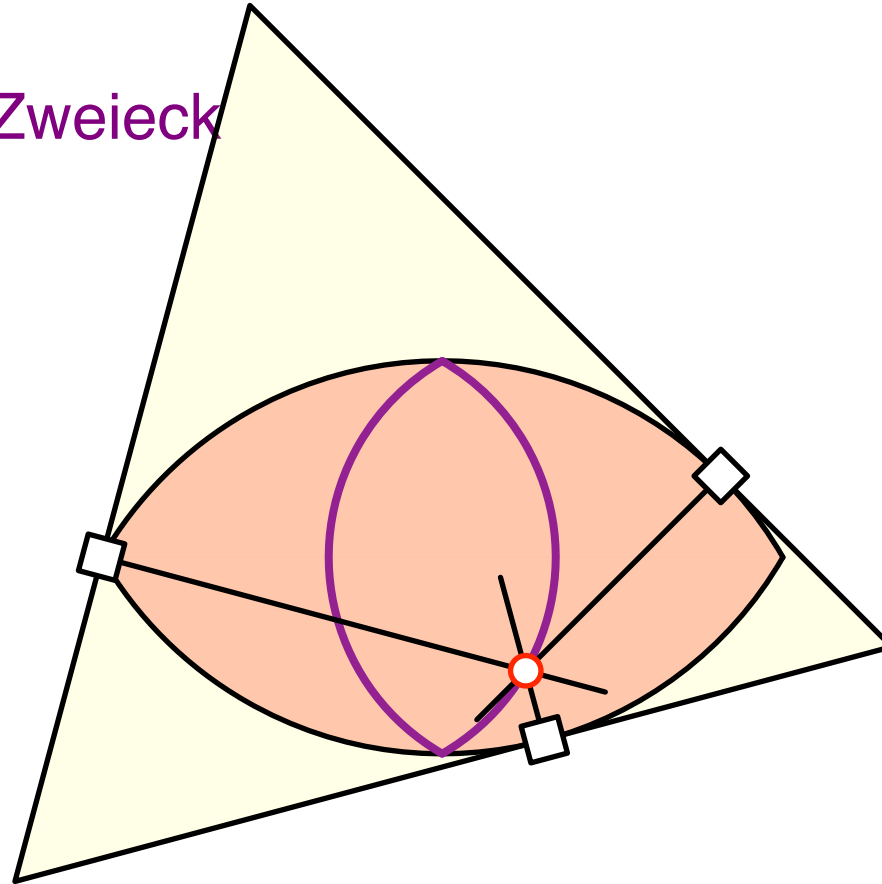


120°-Zweieck

Momentaner Drehpunkt

Ortslinie

relativ zum Zweieck

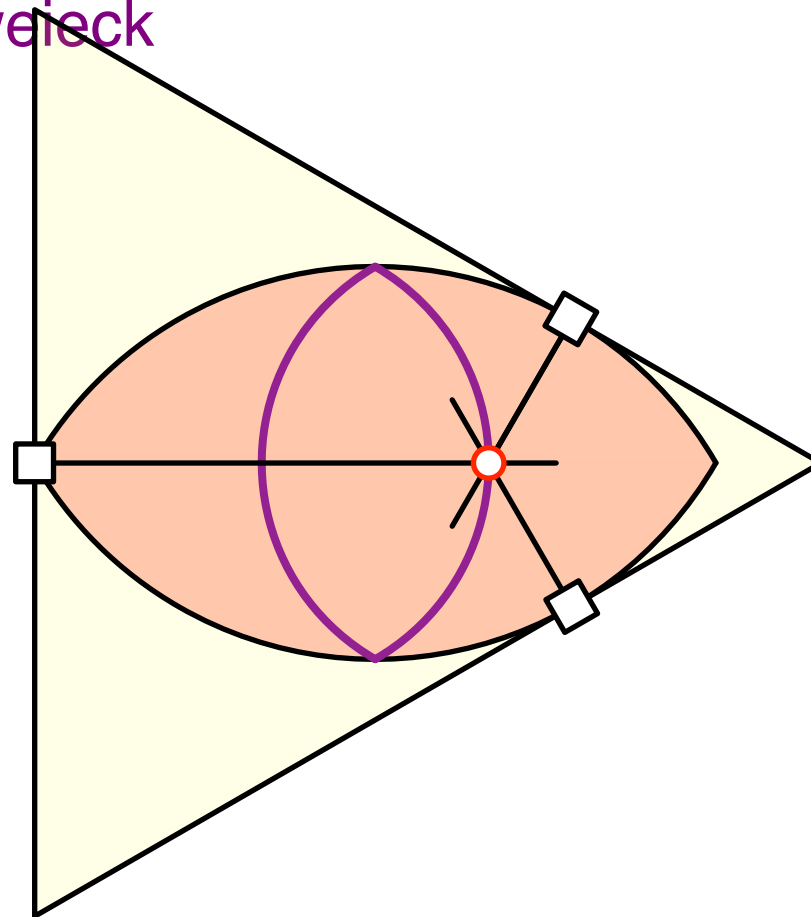


120°-Zweieck

Momentaner Drehpunkt

Ortslinie

relativ zum Zweieck

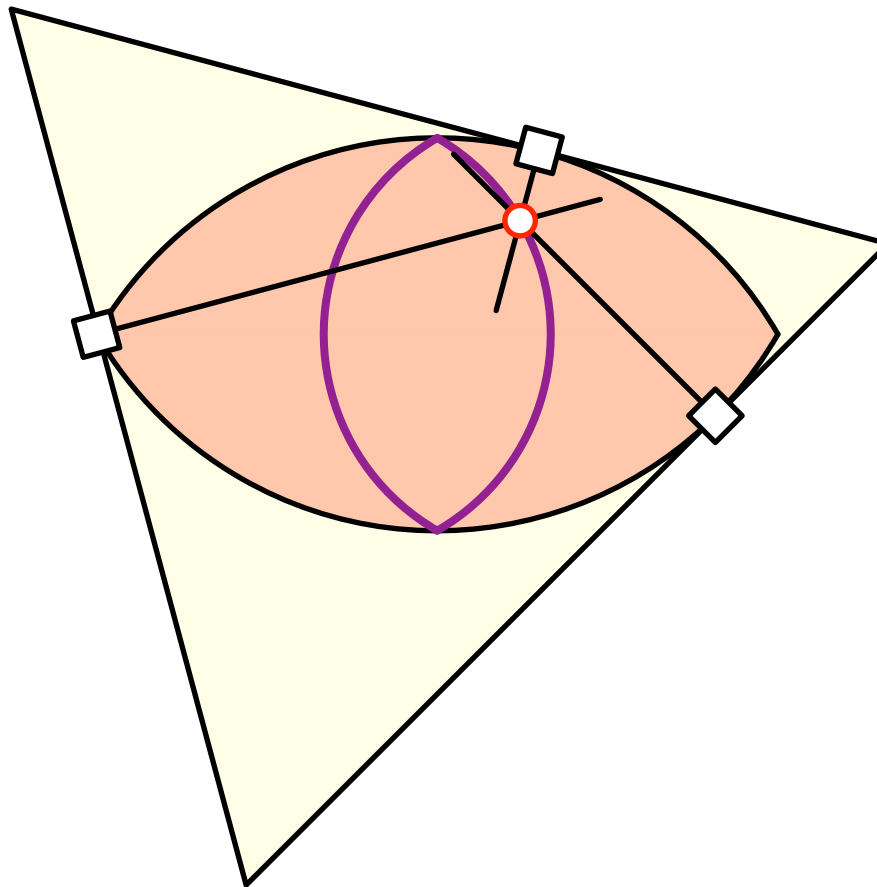


120°-Zweieck

Momentaner Drehpunkt

Ortslinie

relativ zum Zweieck

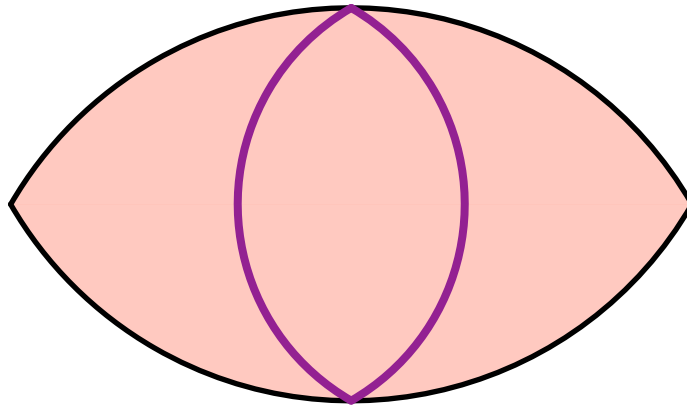


120°-Zweieck

Momentaner Drehpunkt

Ortslinie

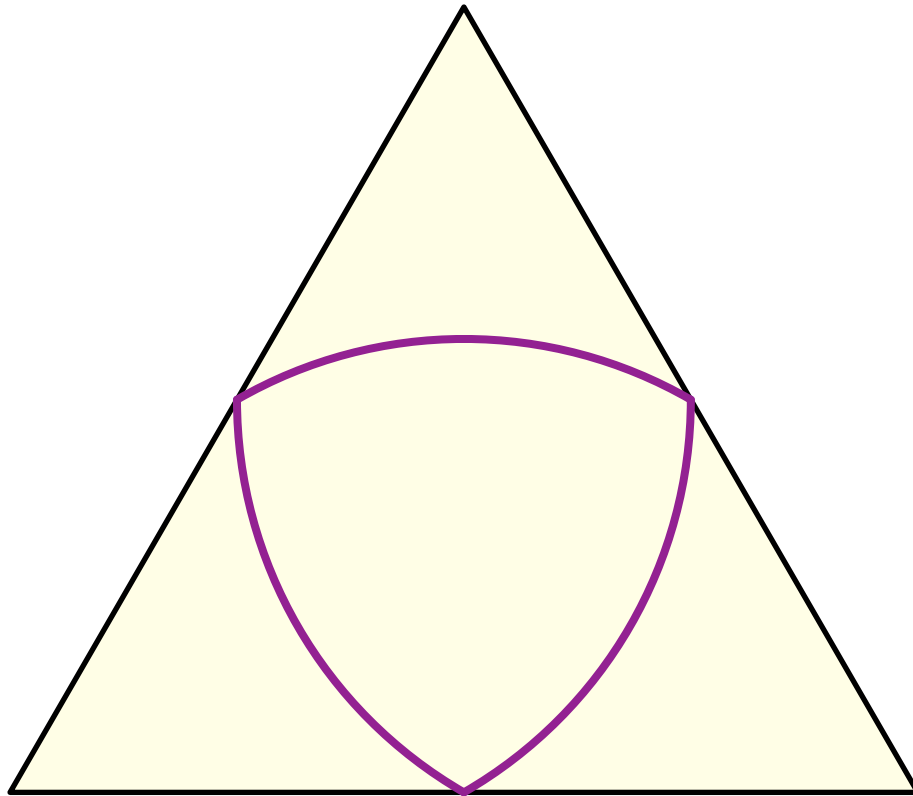
relativ zum Zweieck



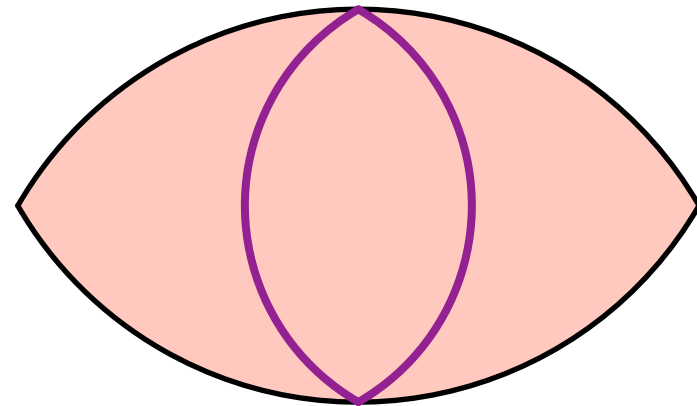
120°-Zweieck



*There are more things  
in heaven and earth, Horatio,  
Than are dreamt of in your philosophy.*



Reuleaux-Dreieck

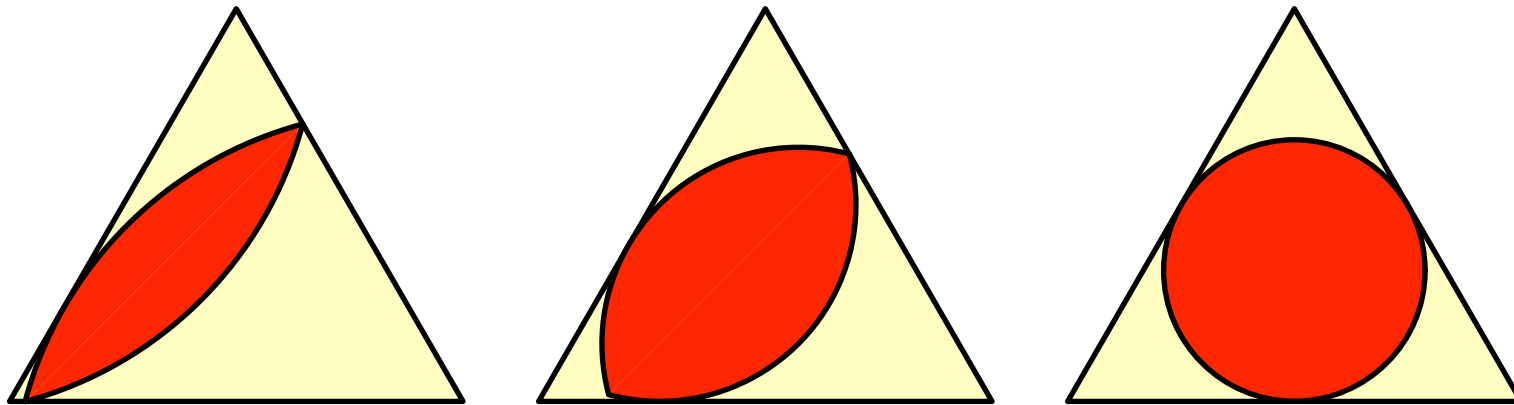


120°-Zweieck

Gleiche Punktmenge, unterschiedliche Symmetrien

Reuleaux-Zweiecke im gleichseitigen Dreieck:

60°-Zweieck, 120°-Zweieck, 180°-Zweieck (Inkreis)



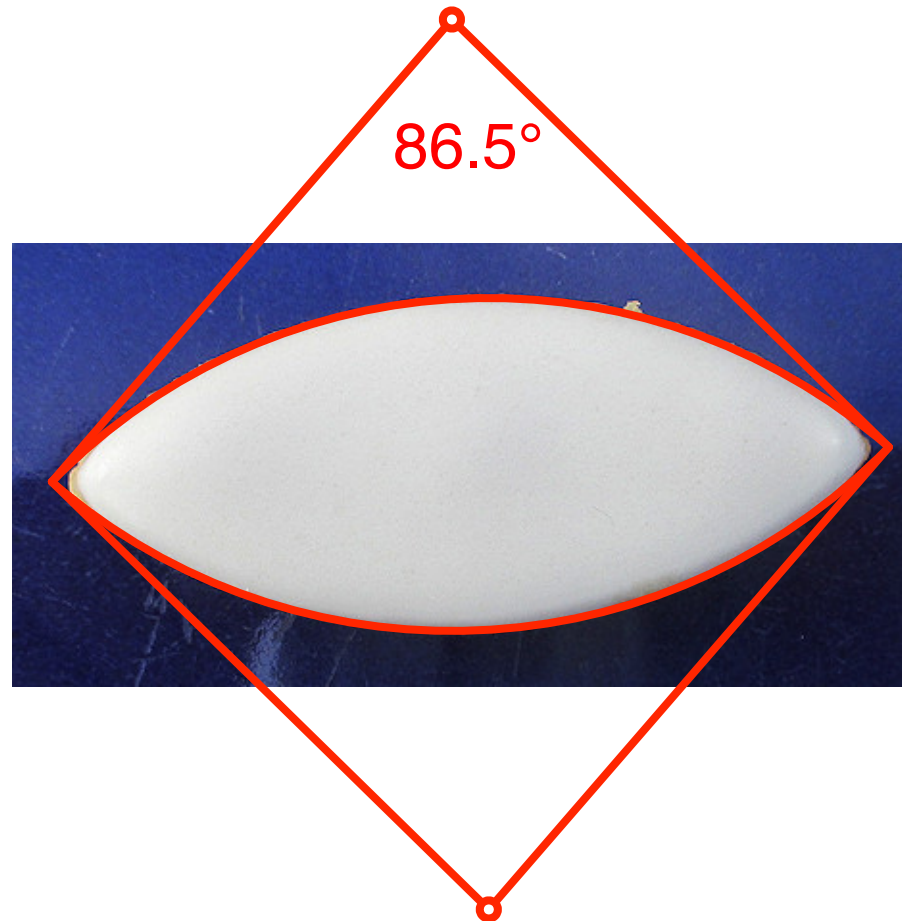
# Calissons de Provence



# Calissons de Provence



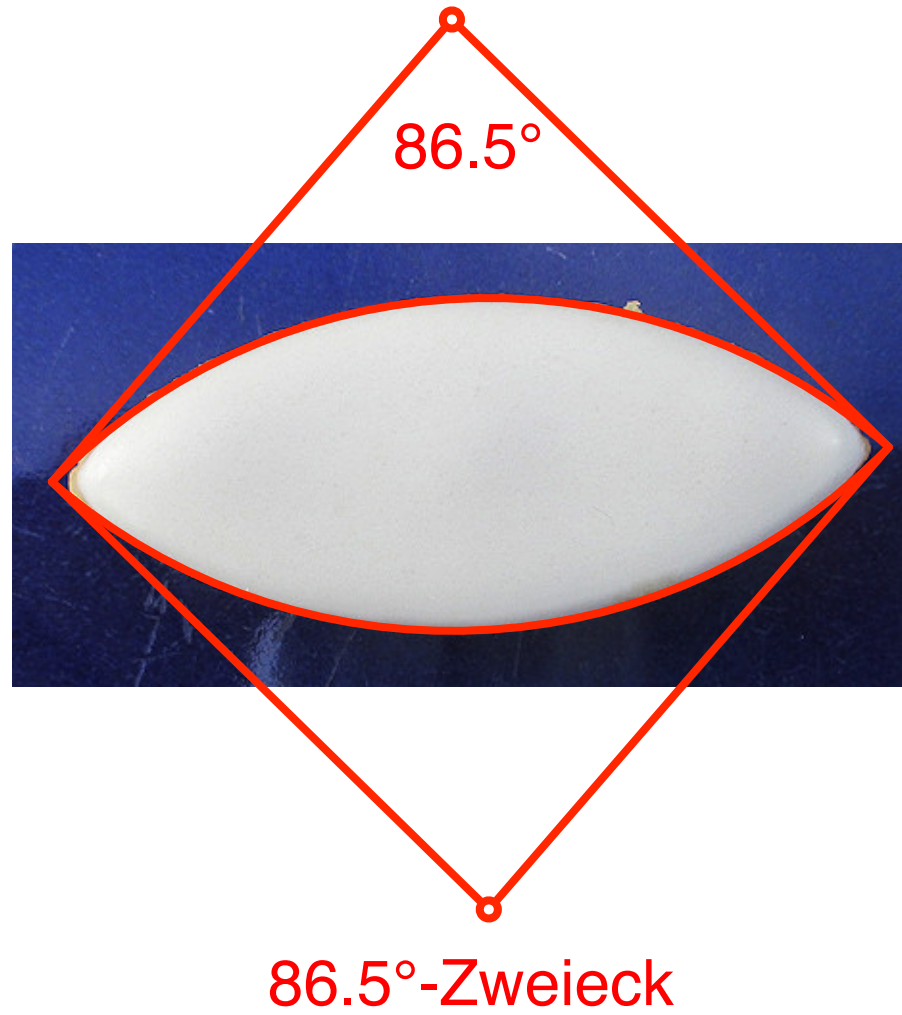
# Calissons de Provence



$86.5^\circ$ -Zweieck

Kann nicht im Dreieck gedreht werden

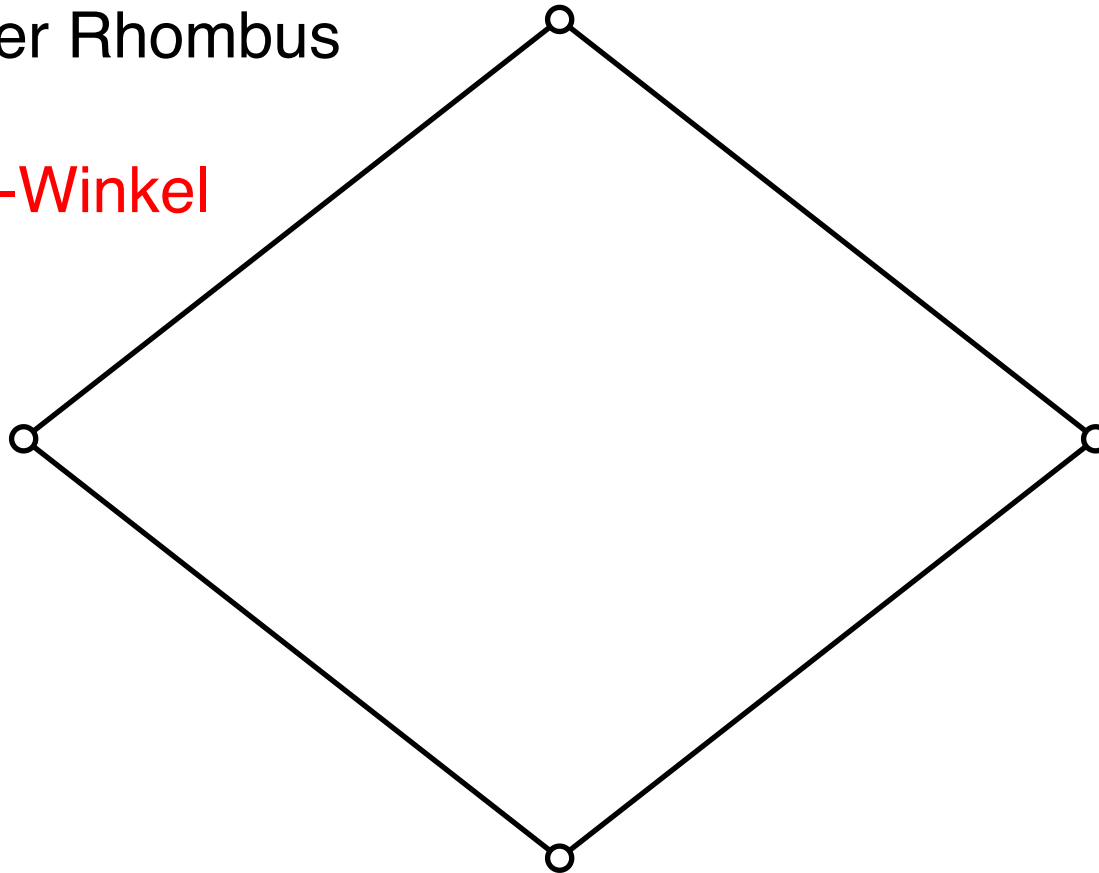
Beliebiges Zweieck



Beliebiges Zweieck

Beliebiger Rhombus

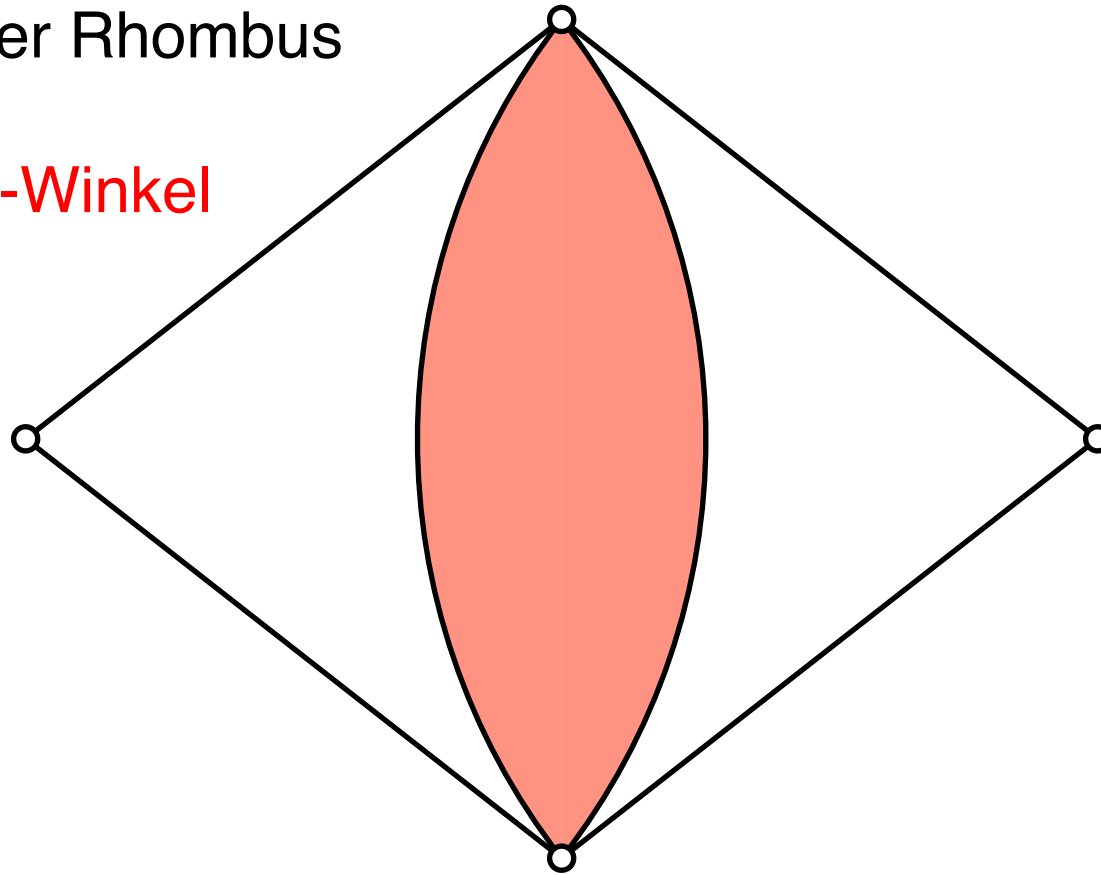
kein  $60^\circ$ -Winkel



Beliebiges Zweieck

Beliebiger Rhombus

kein  $60^\circ$ -Winkel

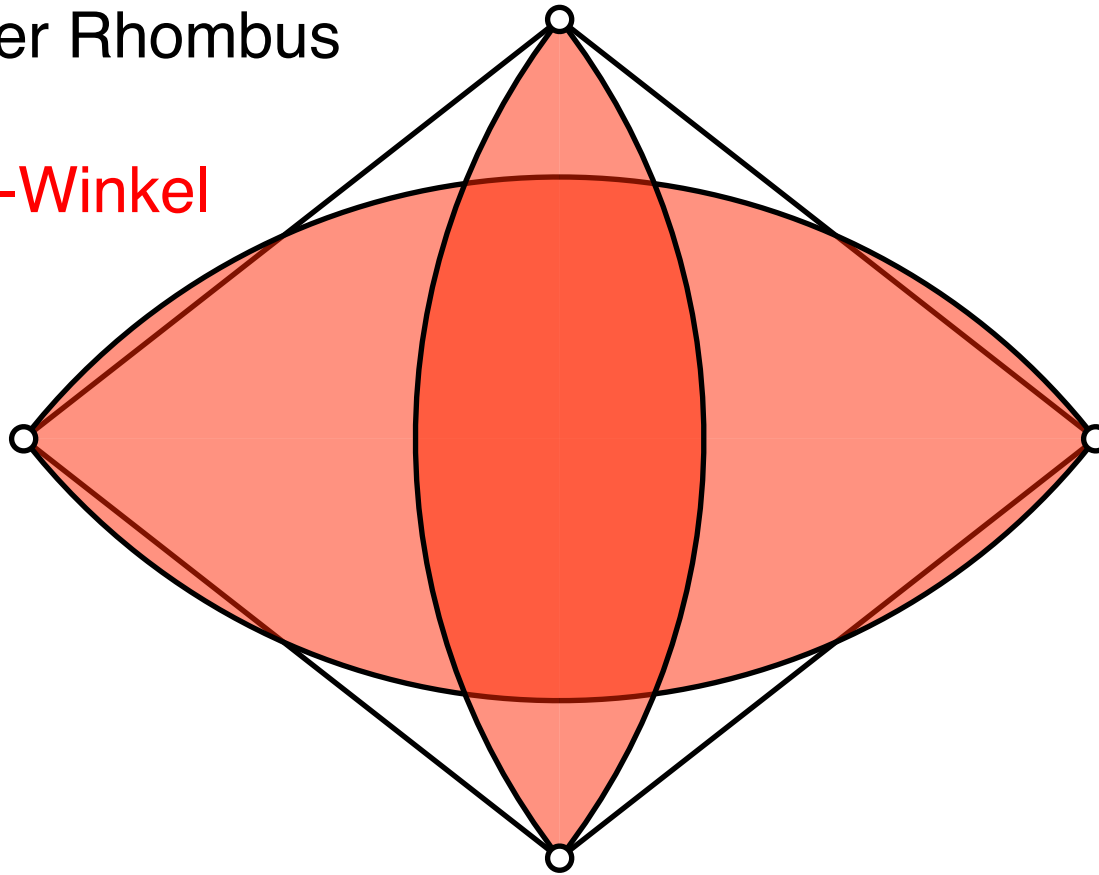




Beliebiges Zweieck

Beliebiger Rhombus

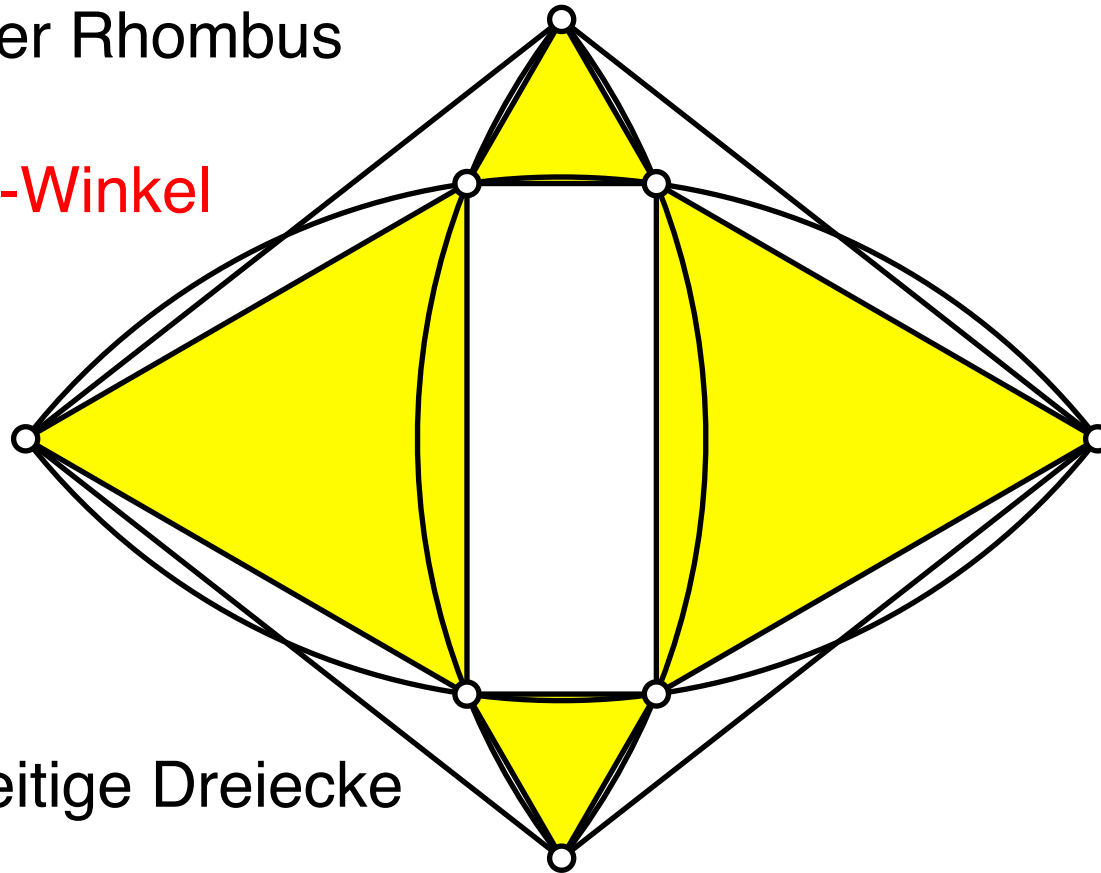
kein  $60^\circ$ -Winkel



Beliebiges Zweieck

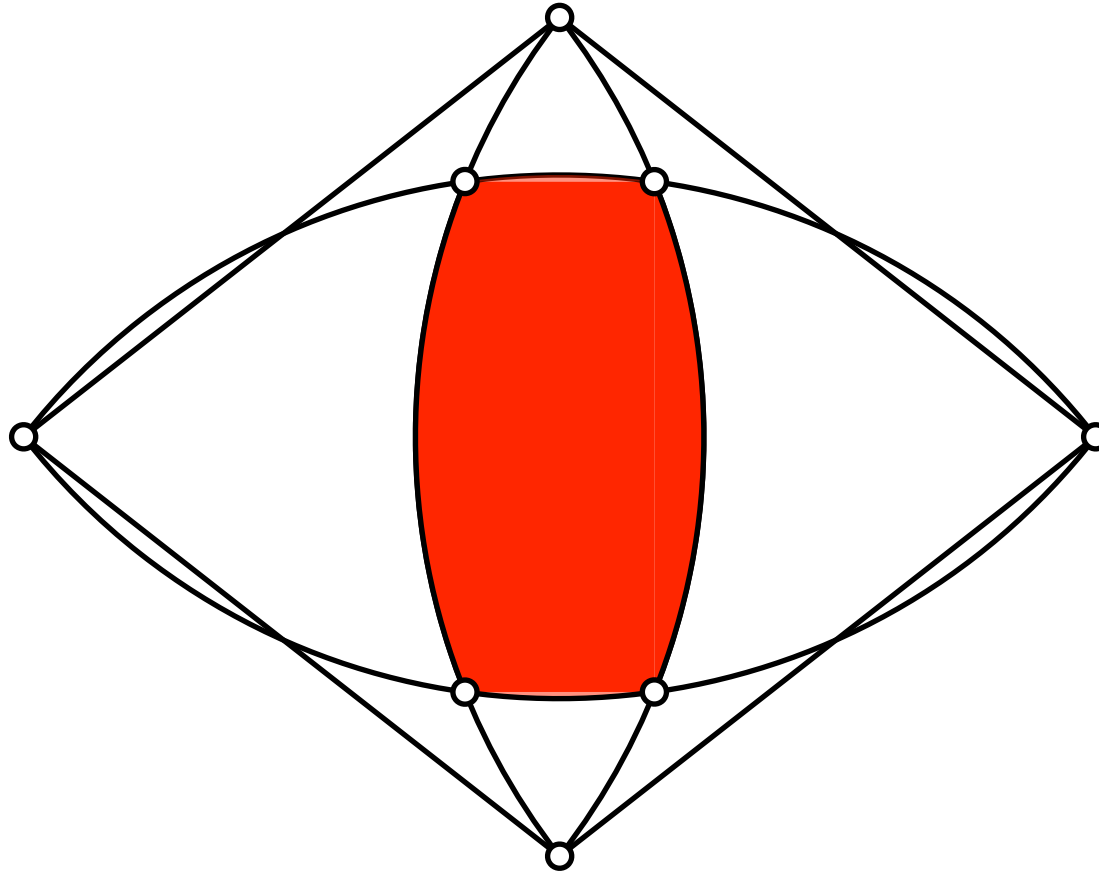
Beliebiger Rhombus

kein  $60^\circ$ -Winkel

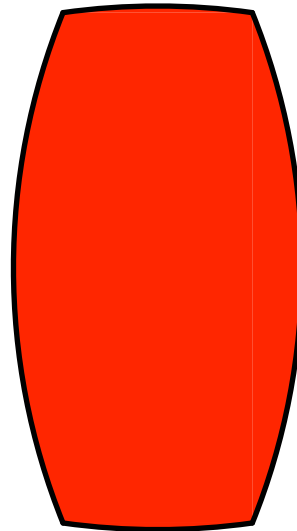


Gleichseitige Dreiecke

Bogen-Viereck

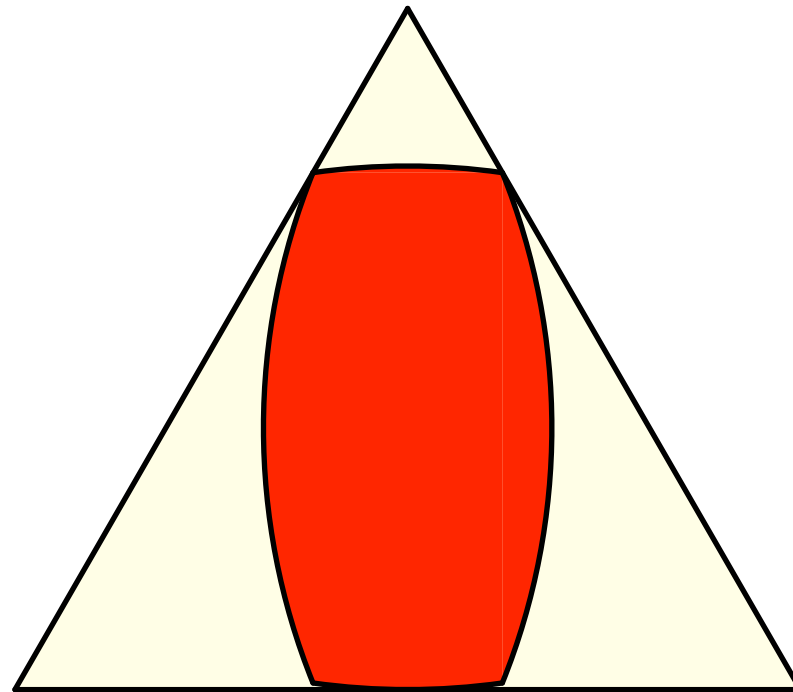


Bogen-Viereck



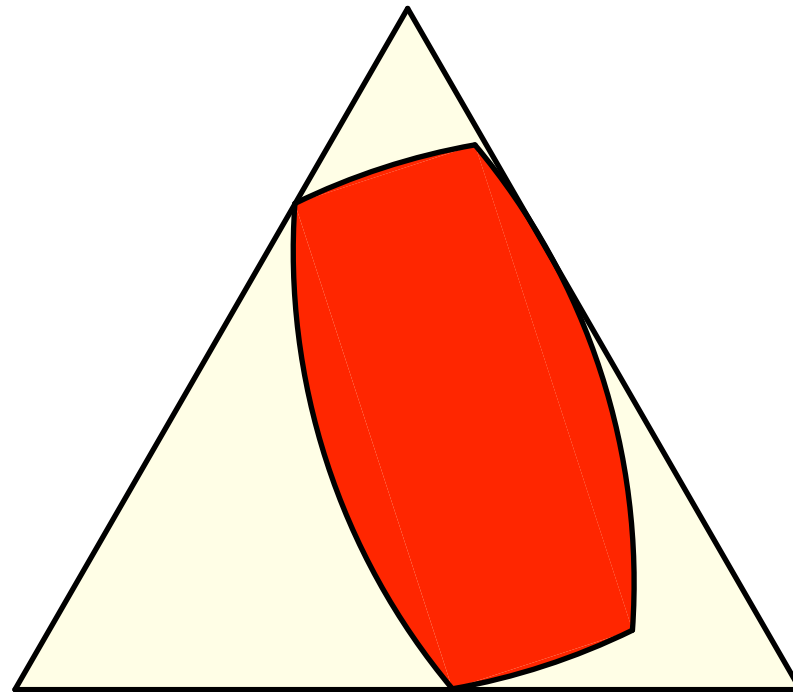
Bogen-Viereck

im Dreieck



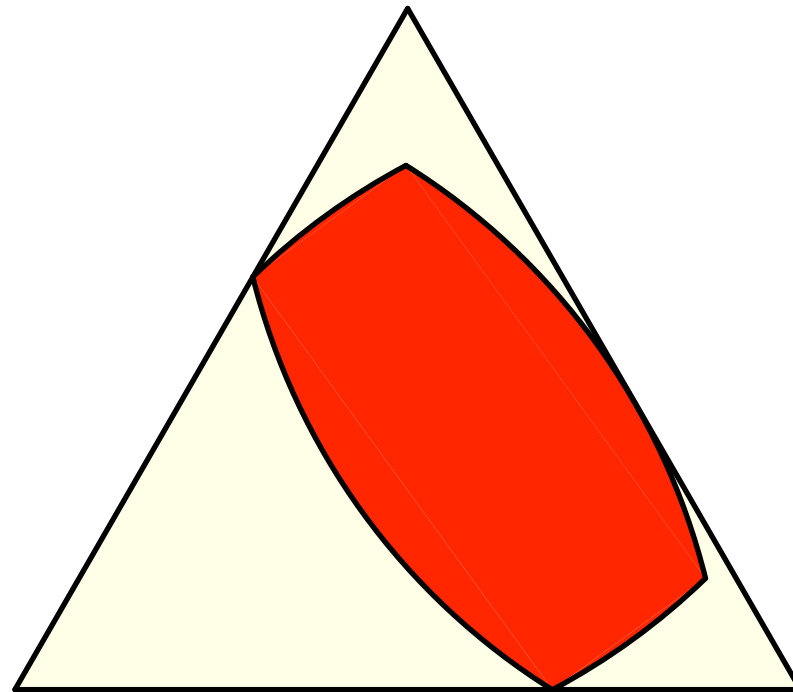
Bogen-Viereck

im Dreieck



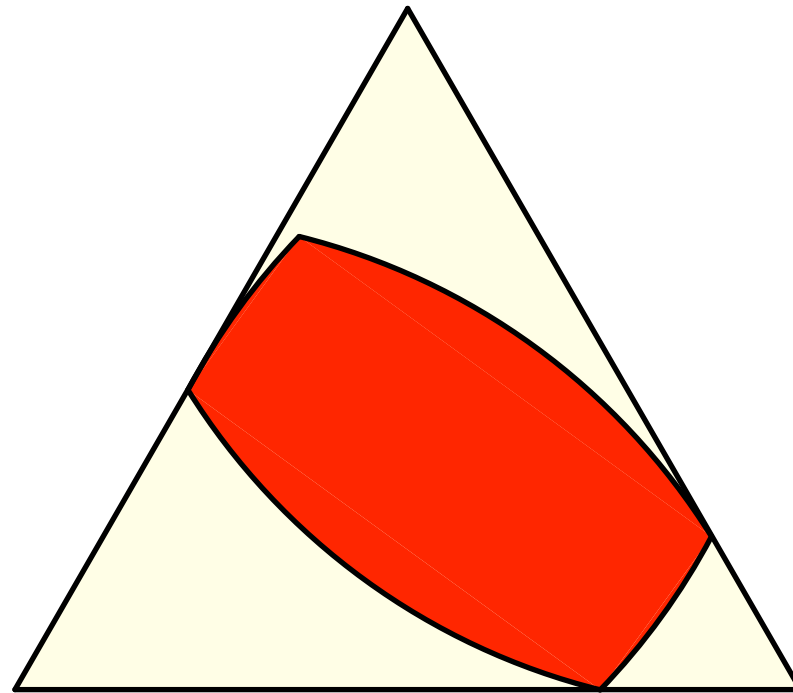
Bogen-Viereck

im Dreieck



Bogen-Viereck

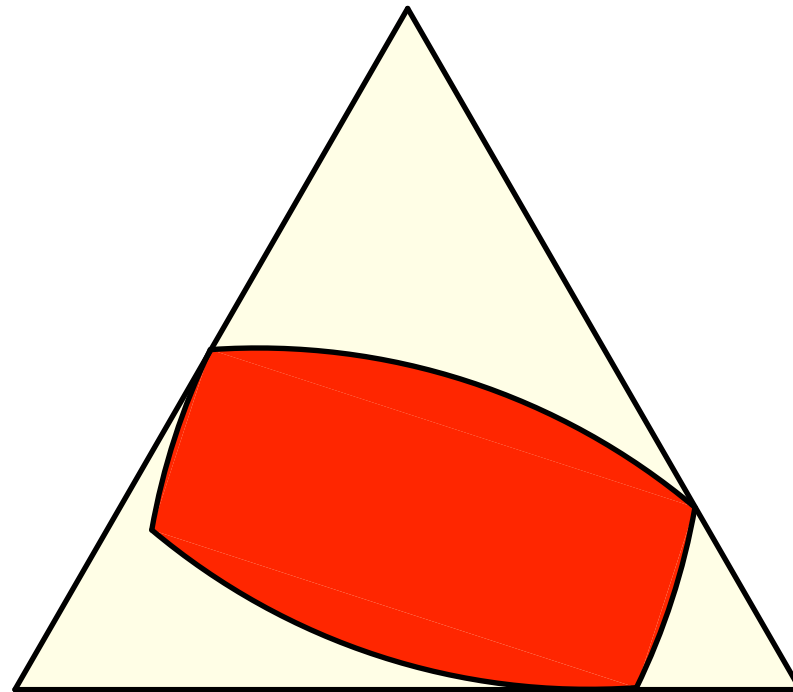
im Dreieck





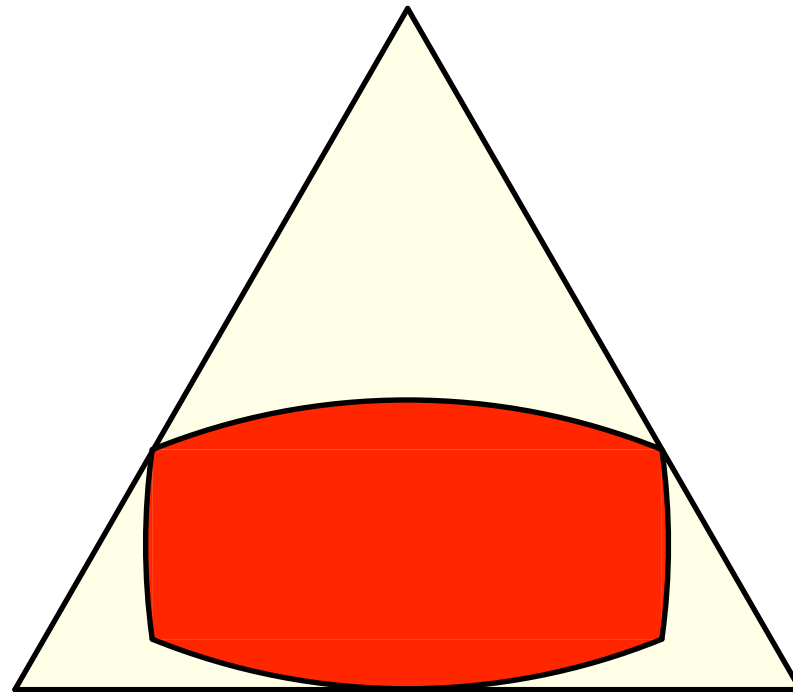
Bogen-Viereck

im Dreieck



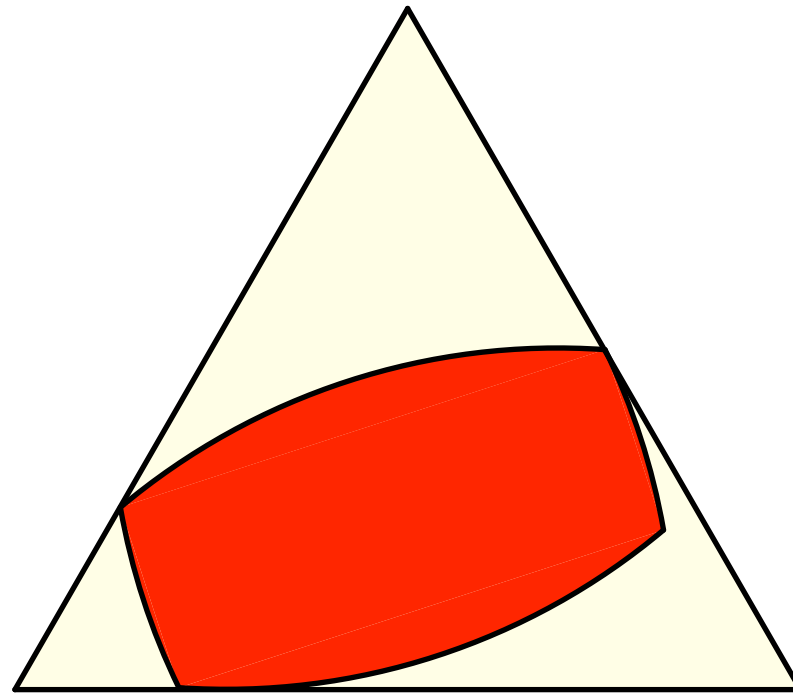
Bogen-Viereck

im Dreieck



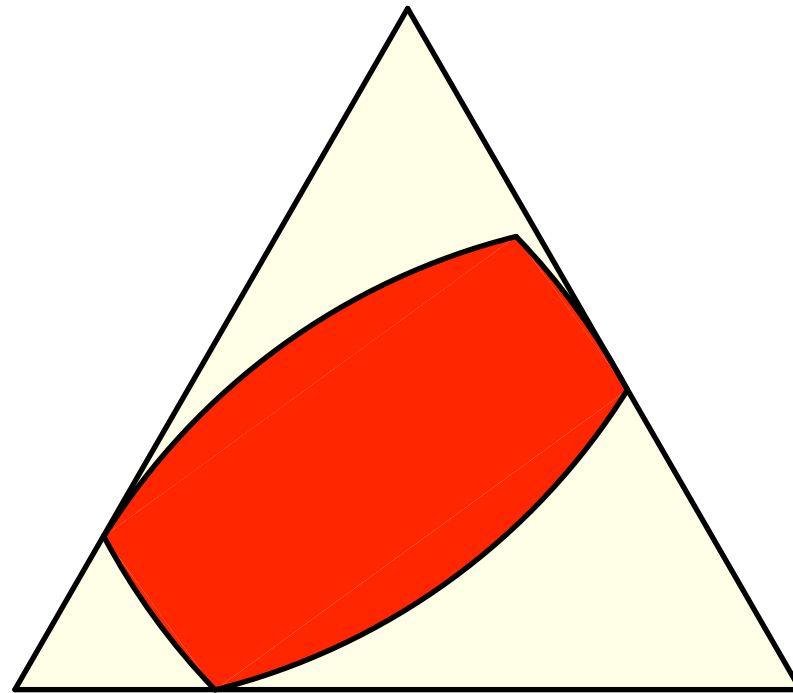
Bogen-Viereck

im Dreieck



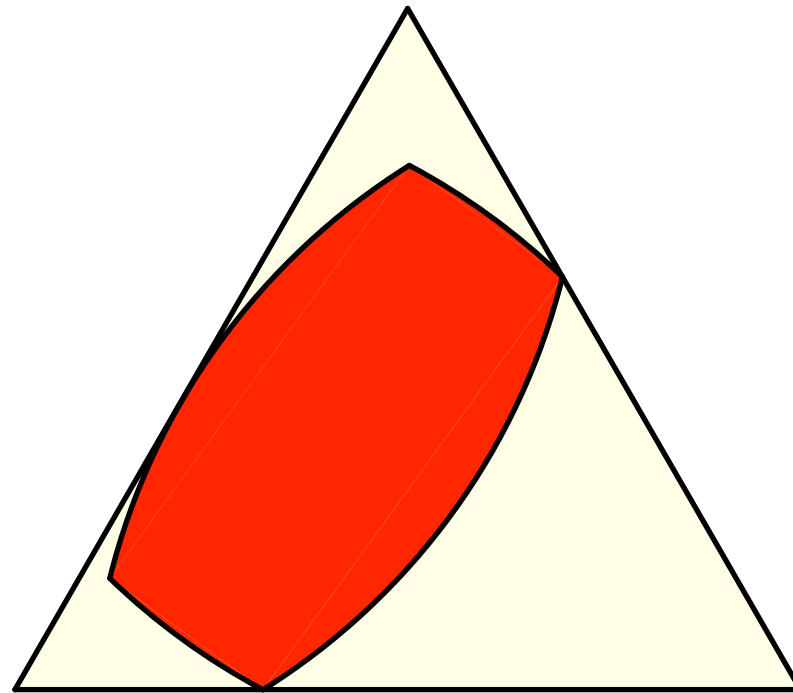
Bogen-Viereck

im Dreieck



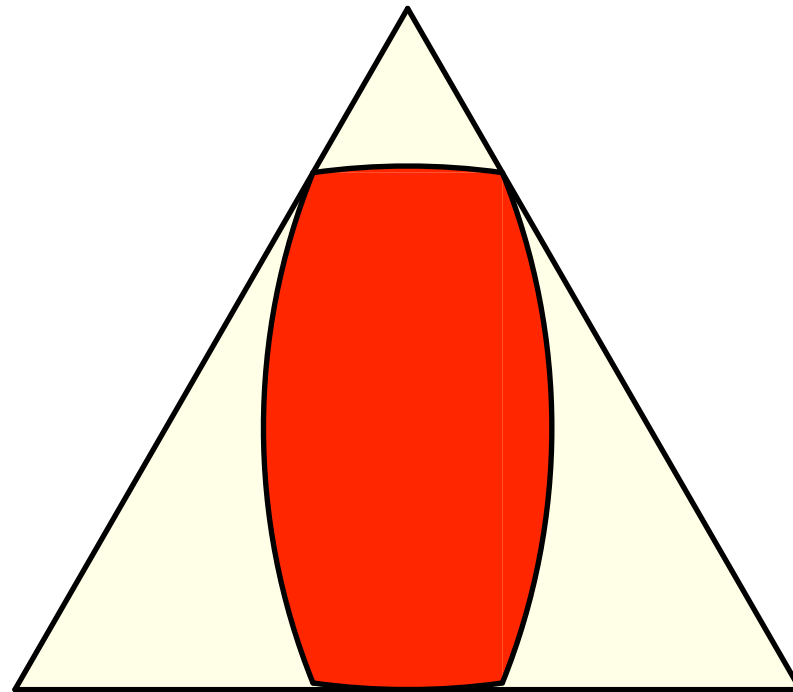
Bogen-Viereck

im Dreieck



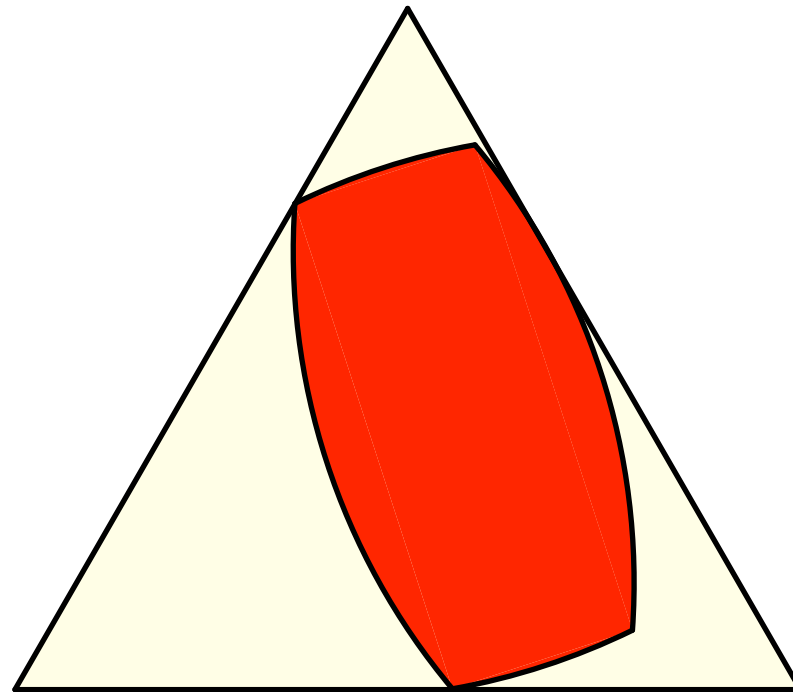
Bogen-Viereck

im Dreieck



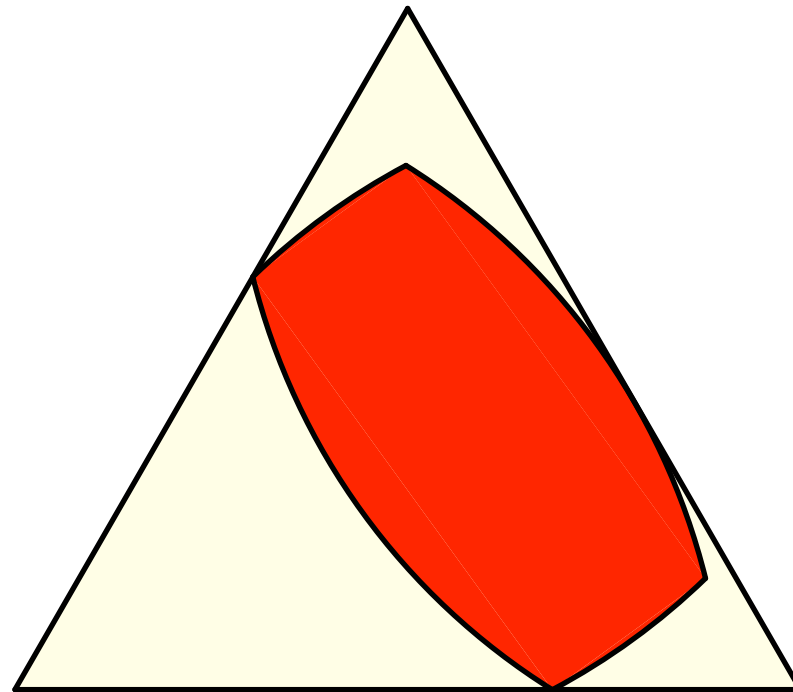
Bogen-Viereck

im Dreieck



Bogen-Viereck

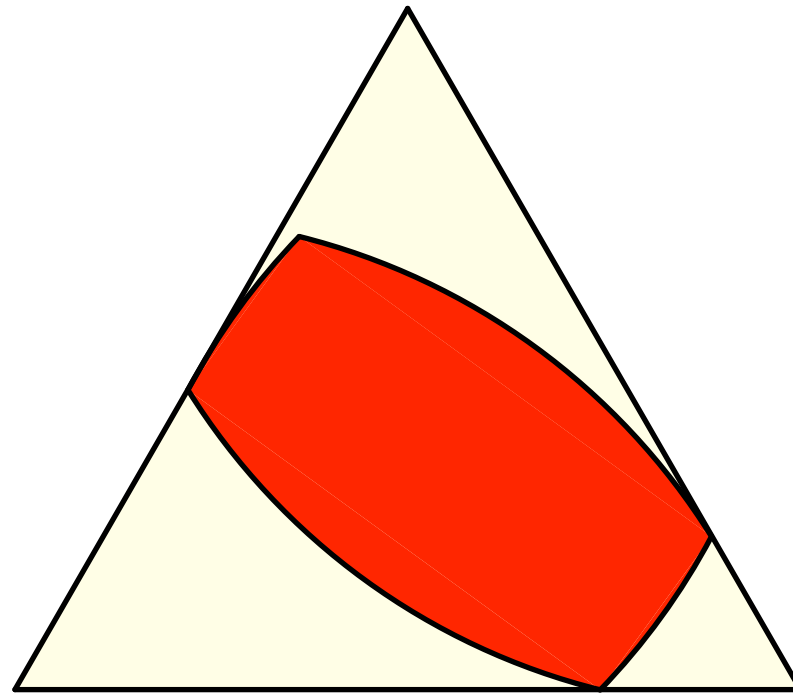
im Dreieck





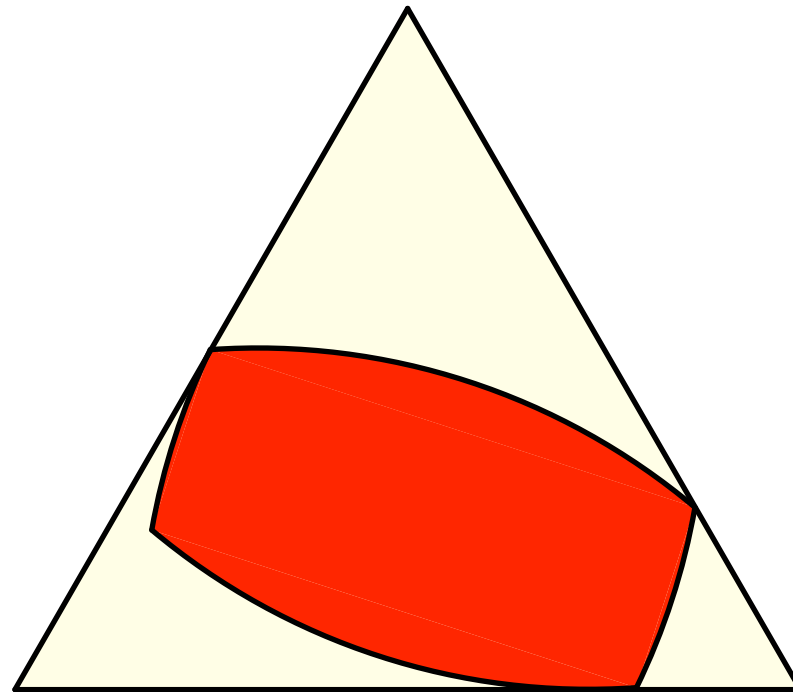
Bogen-Viereck

im Dreieck



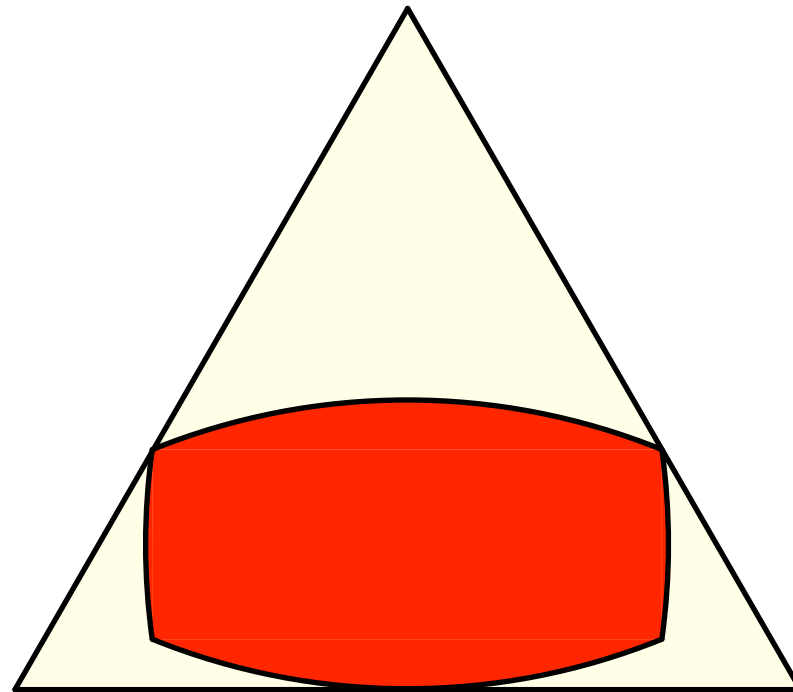
Bogen-Viereck

im Dreieck



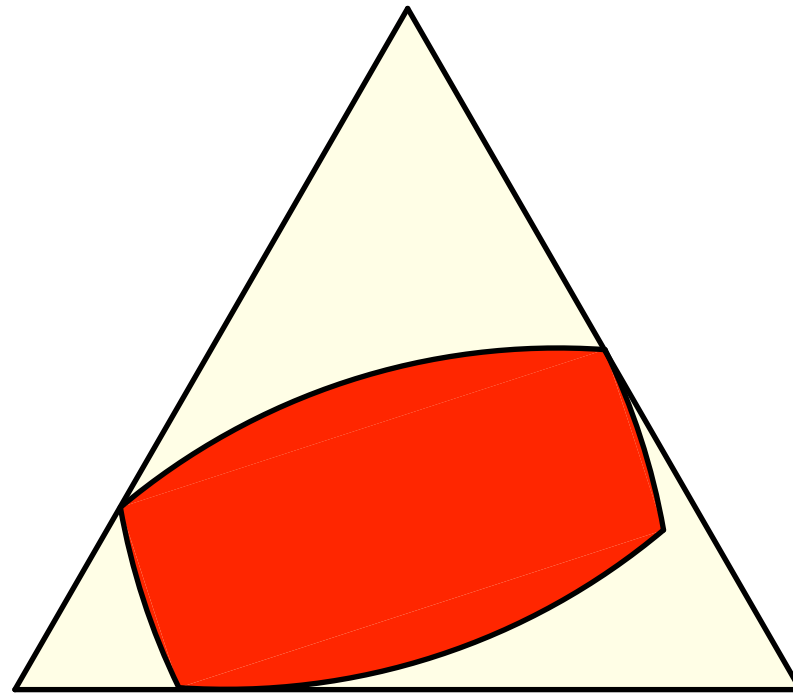
Bogen-Viereck

im Dreieck



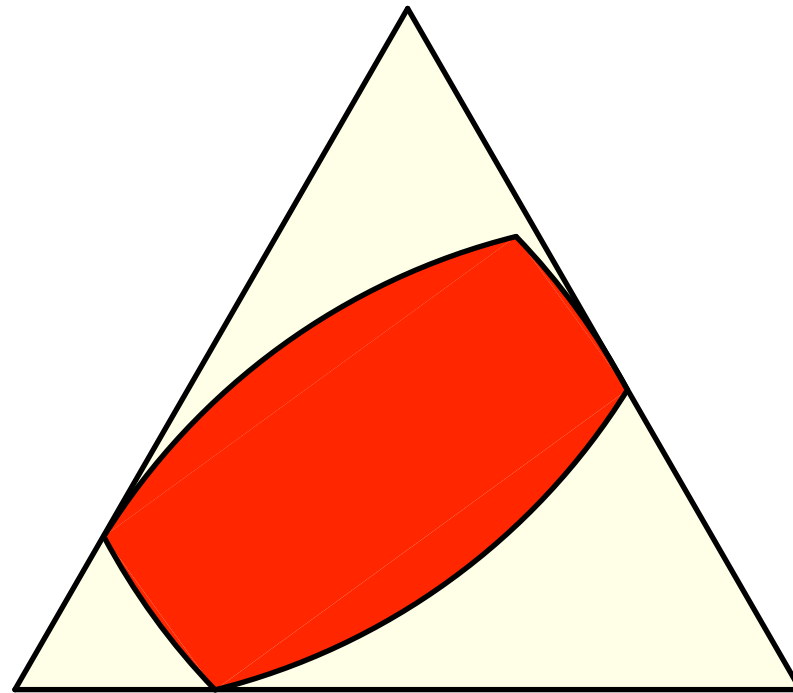
Bogen-Viereck

im Dreieck



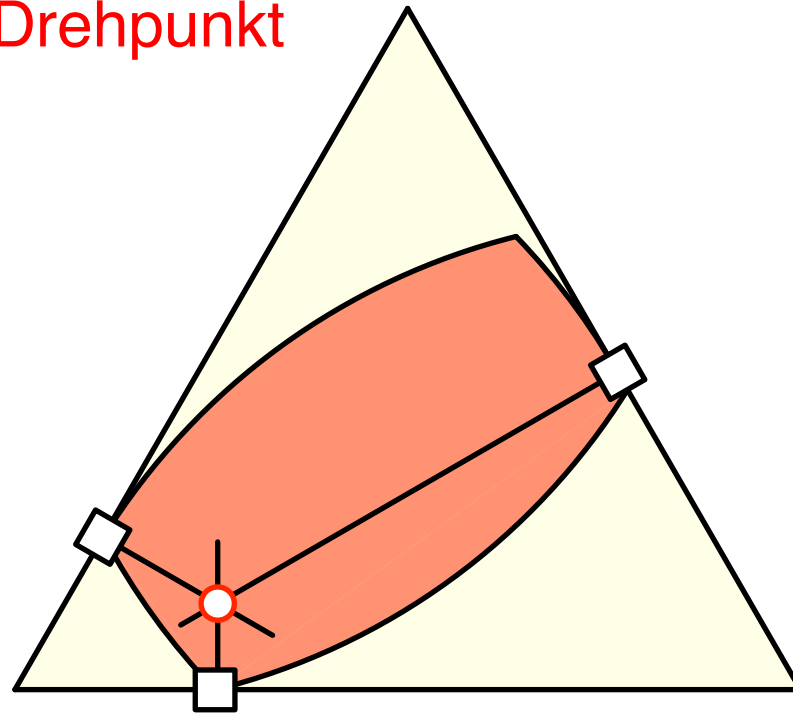
Bogen-Viereck

im Dreieck



Bogen-Viereck

Momentaner Drehpunkt

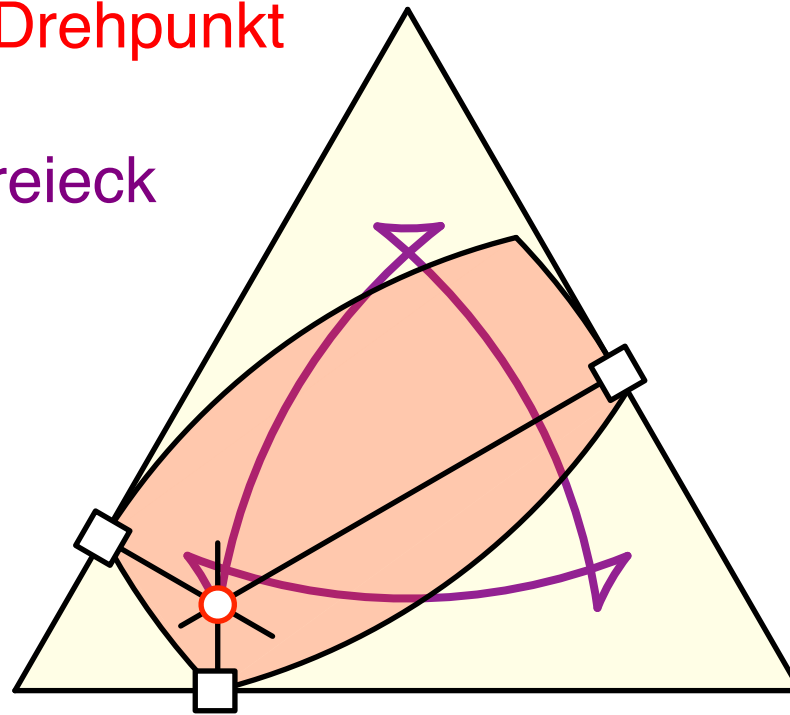


# Bogen-Viereck

Momentaner Drehpunkt

Ortslinie

relativ zum Dreieck

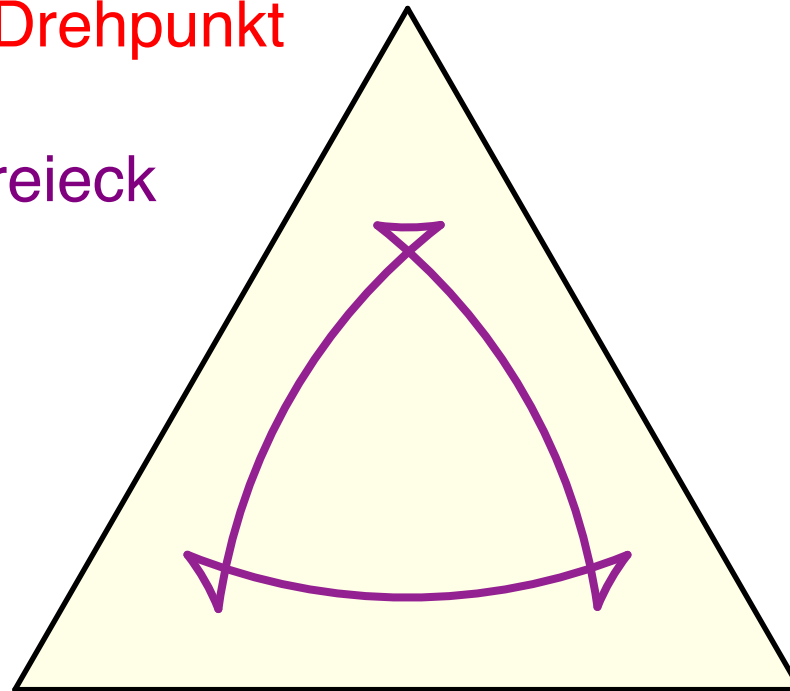


# Bogen-Viereck

Momentaner Drehpunkt

Ortslinie

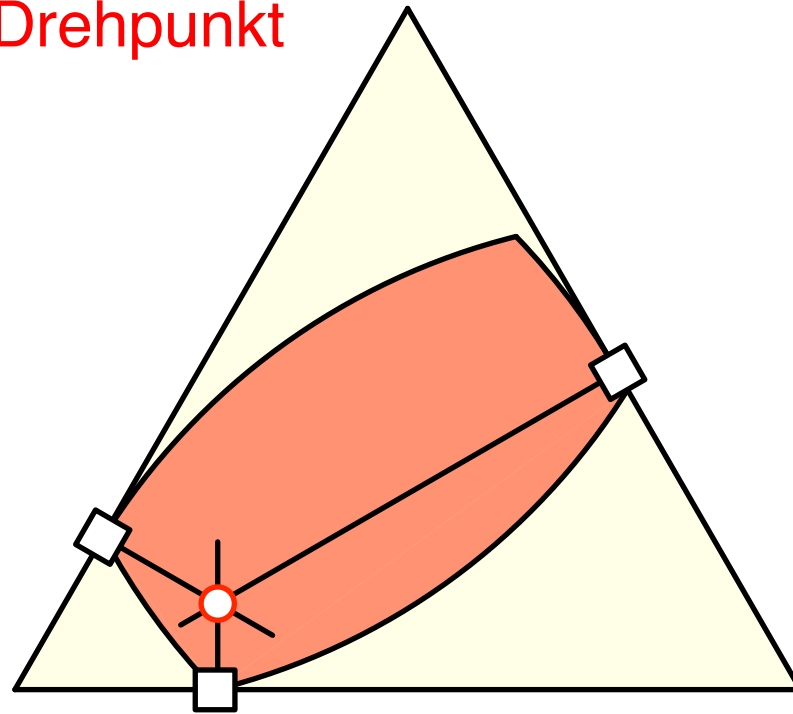
relativ zum Dreieck





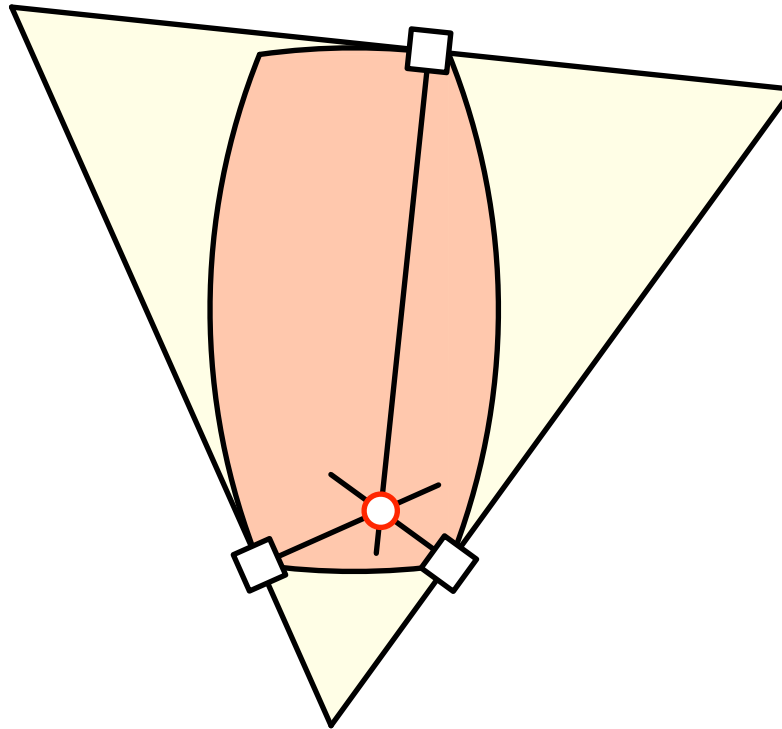
Bogen-Viereck

Momentaner Drehpunkt



Bogen-Viereck

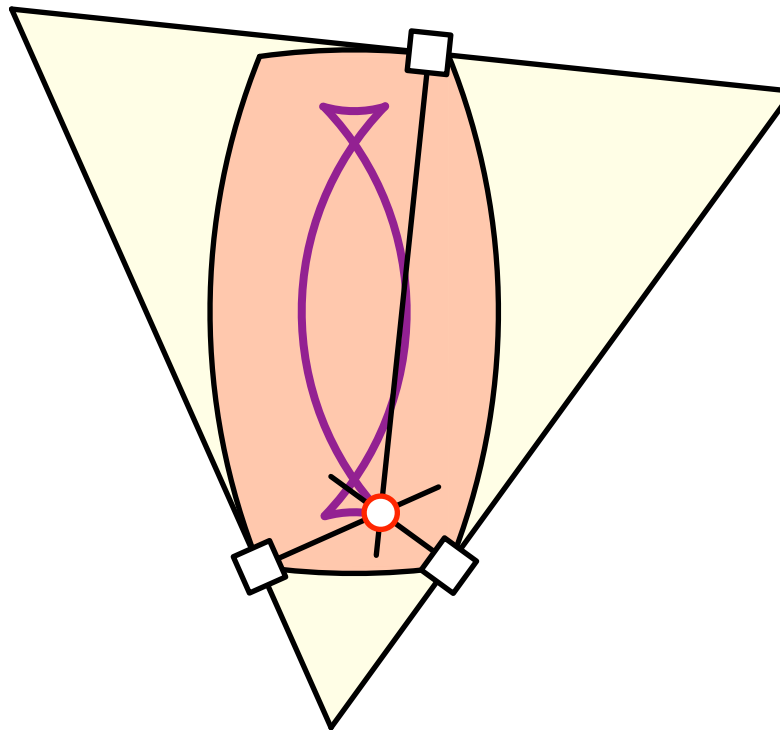
Momentaner Drehpunkt



Bogen-Viereck

Momentaner Drehpunkt

Ortslinie  
relativ zum  
Bogen-Viereck



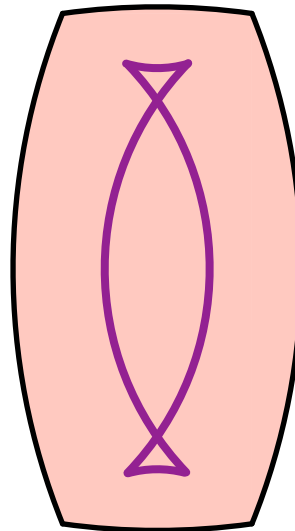
Bogen-Viereck

Momentaner Drehpunkt

Ortslinie

relativ zum

Bogen-Viereck



# Danke

