

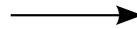
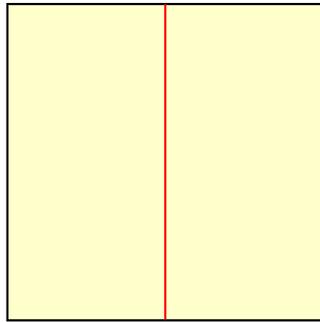
# ORIGAMI COMPUTACIONAL

MAC499 Trabalho de Formatura Supervisionado  
baseado em Iniciação Científica

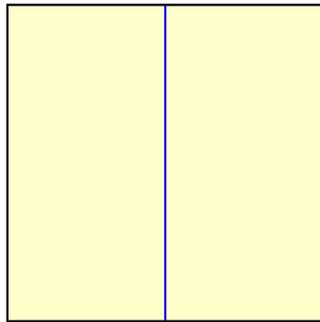
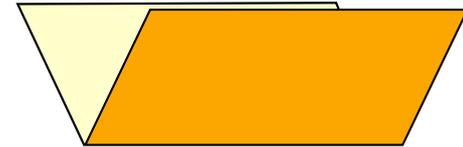
Deise Harumi Aoki  
Rafael Antonio Cosentino

José Coelho de Pina  
Paulo Eduardo Azevedo Silveira

# Vale e Montanha



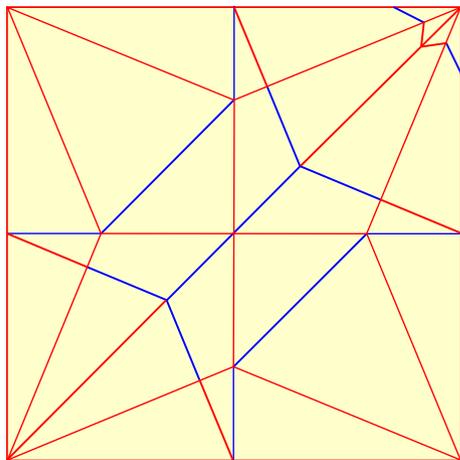
vale



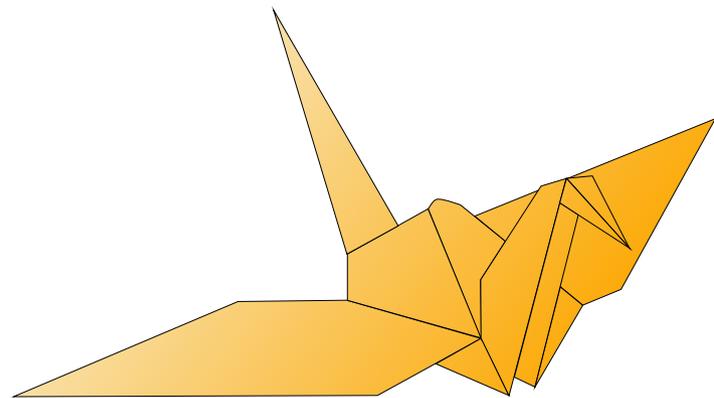
montanha



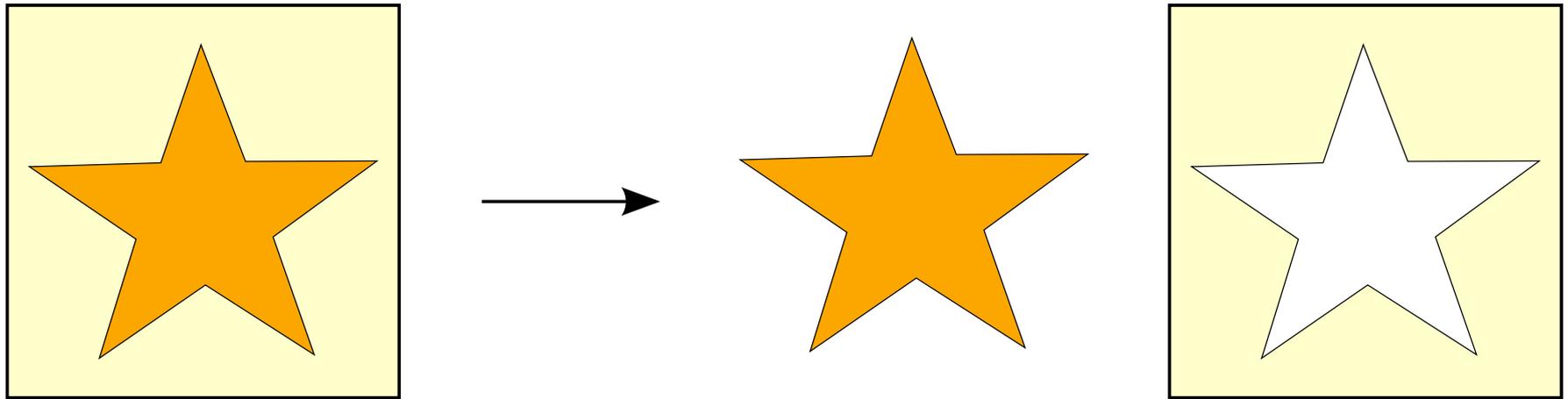
# Diagrama



Processo  
de  
Dobras

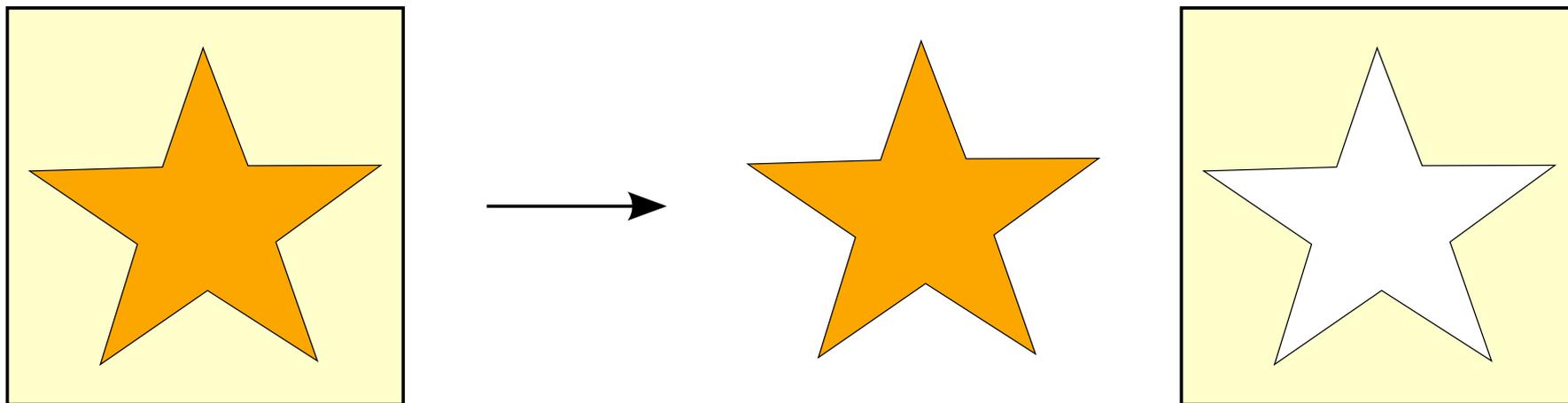


# Problema de Dobrar e Cortar



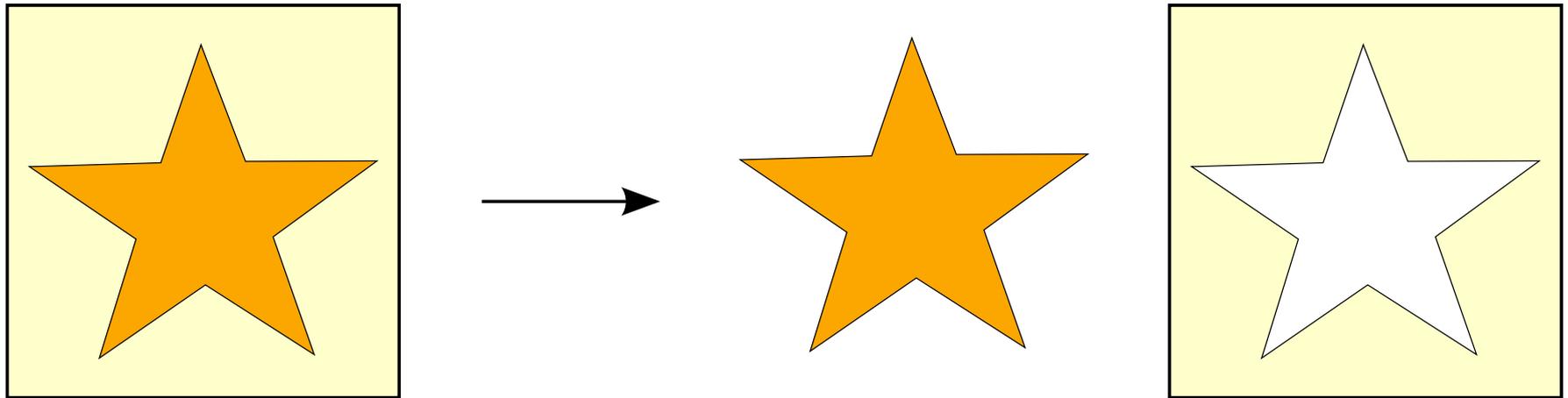
Imagine um polígono desenhado em um pedaço de papel. O nosso problema consiste em separar o polígono do restante do papel através de um corte reto de tesoura. Para isso, é permitido que você dobre o papel.

# Problema de Dobrar e Cortar



Imagine um polígono desenhado em um pedaço de papel. O nosso problema consiste em separar o polígono do restante do papel através de um corte reto de tesoura. Para isso, é permitido que você dobre o papel. **Para quais polígonos isso é possível?**

# Problema de Dobrar e Cortar

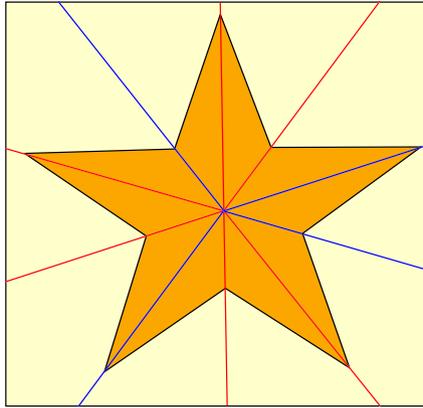


Imagine um polígono desenhado em um pedaço de papel. O nosso problema consiste em separar o polígono do restante do papel através de um corte reto de tesoura. Para isso, é permitido que você dobre o papel. **Para quais polígonos isso é possível?**

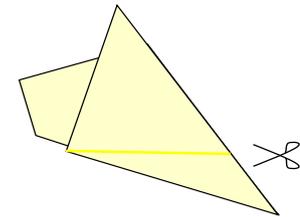
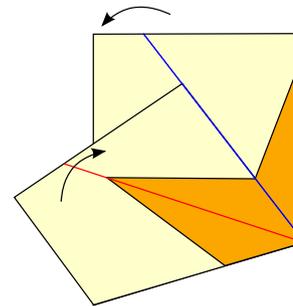
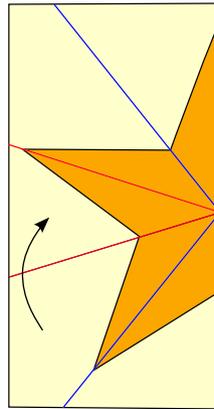
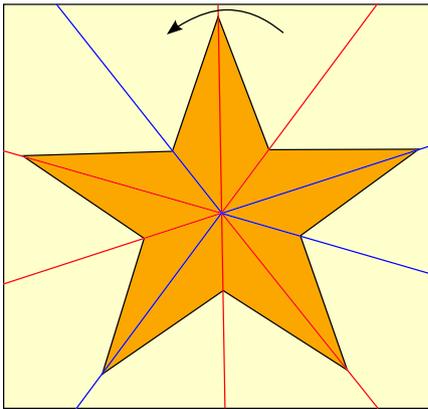
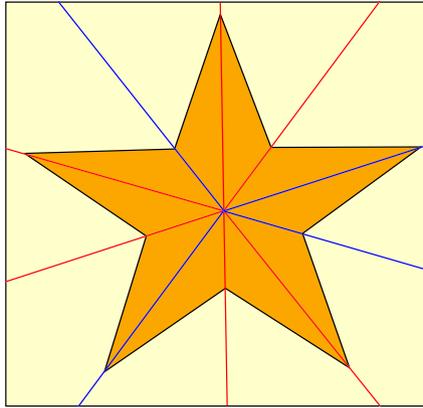
**Todos!**

# O que seria uma solução?

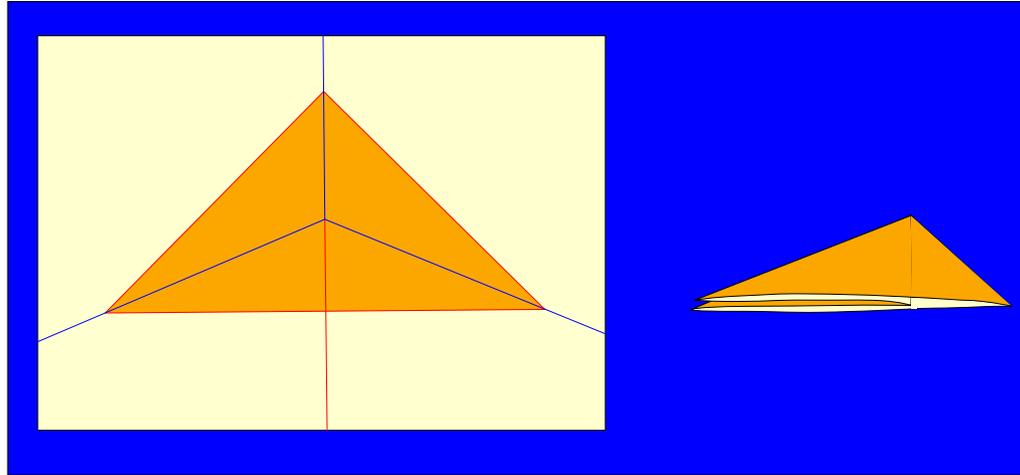
# O que seria uma solução?



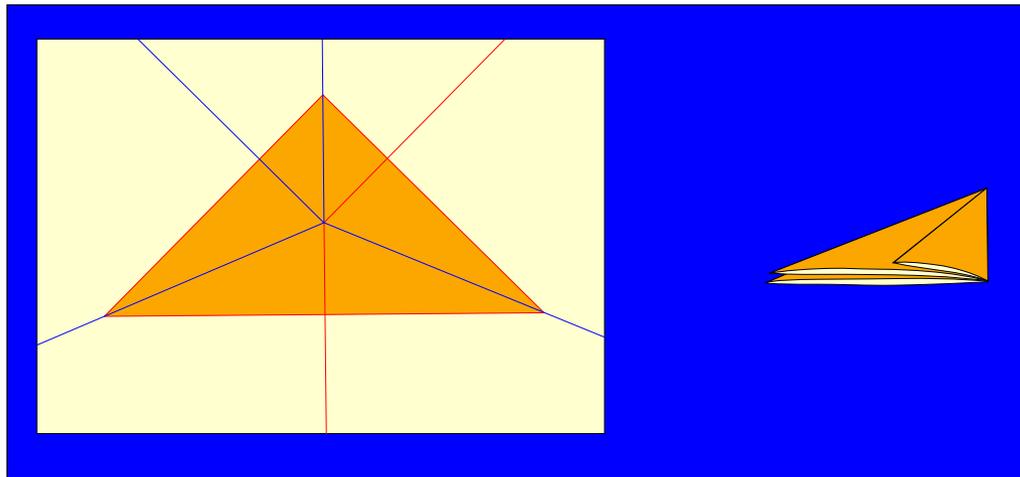
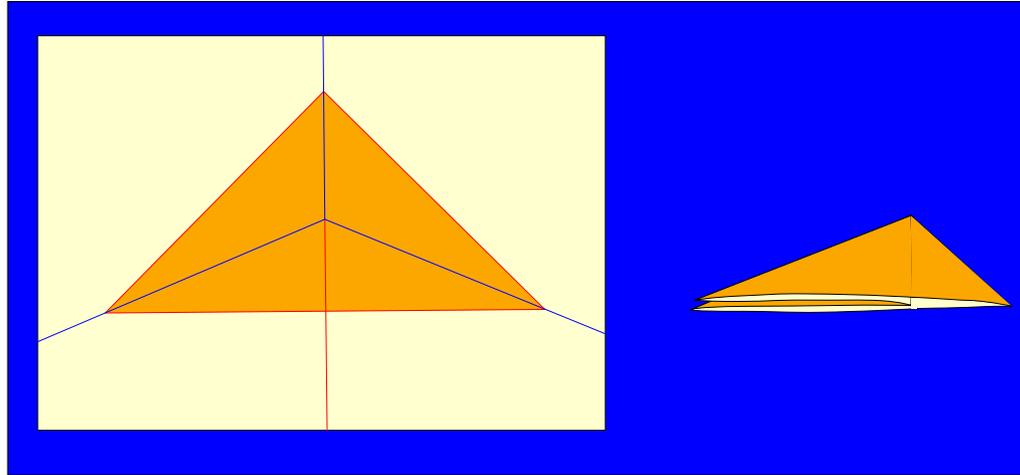
# O que seria uma solução?



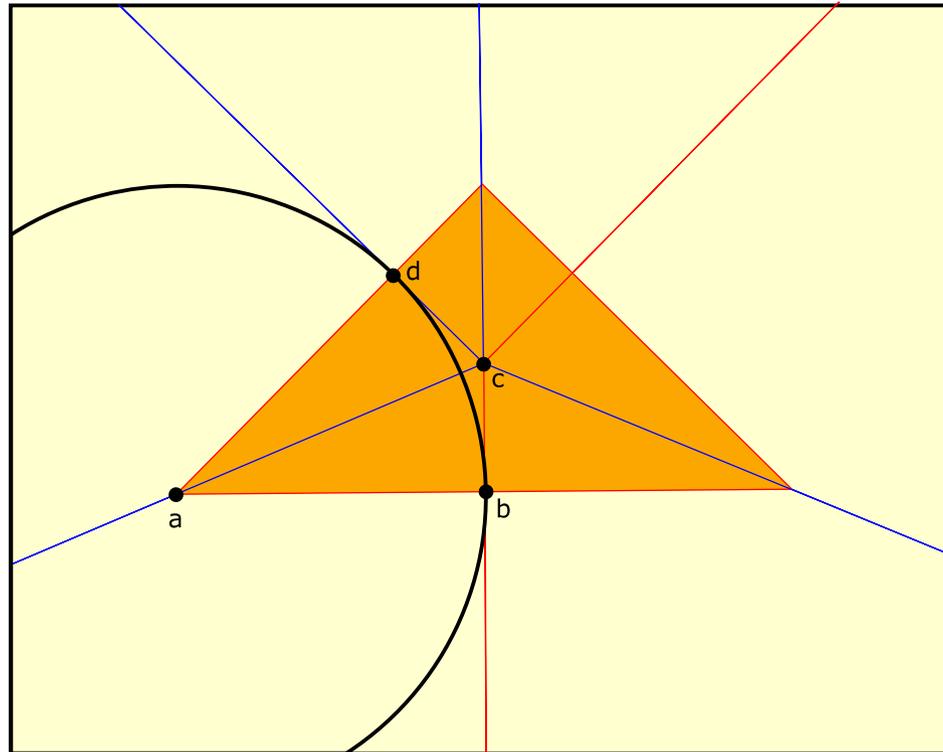
# Dobrando triângulos



# Dobrando triângulos

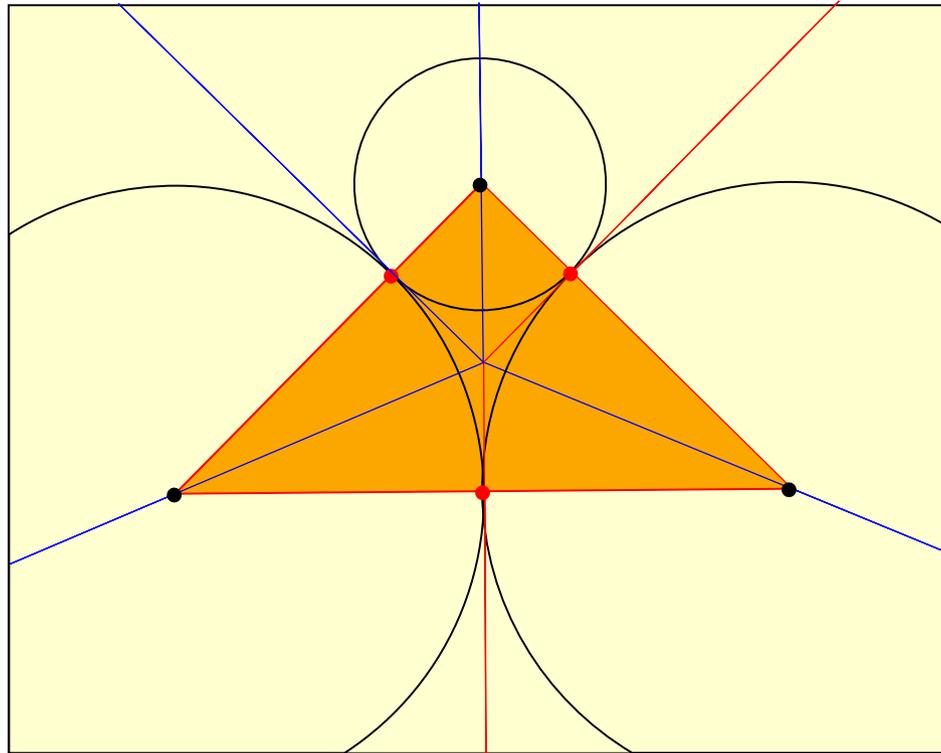


# Análise das dobras

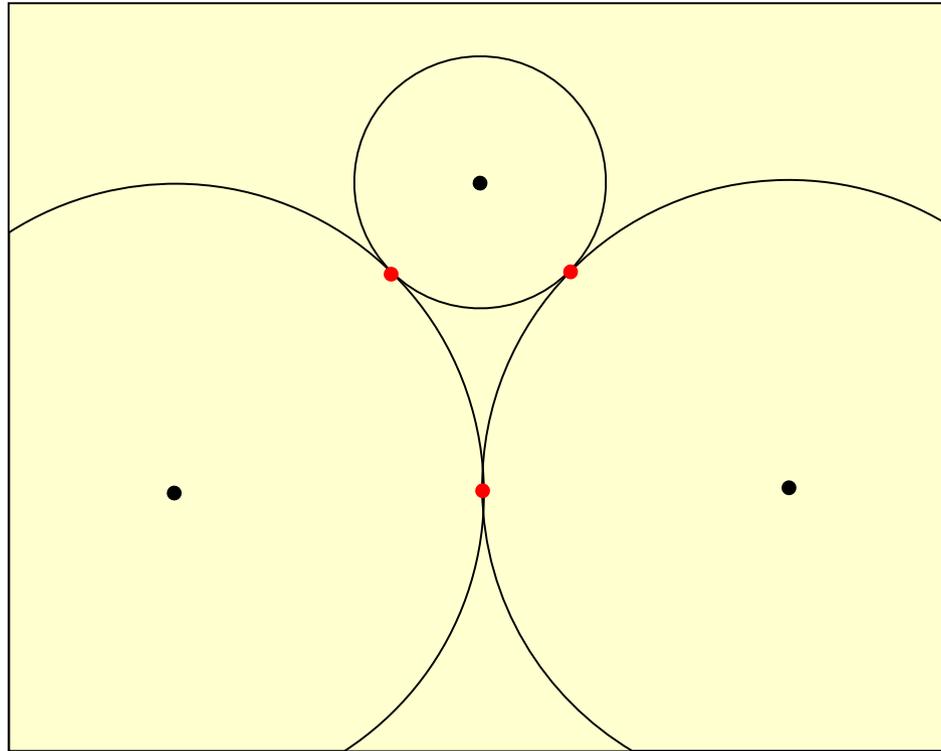


ALGUMA COISA

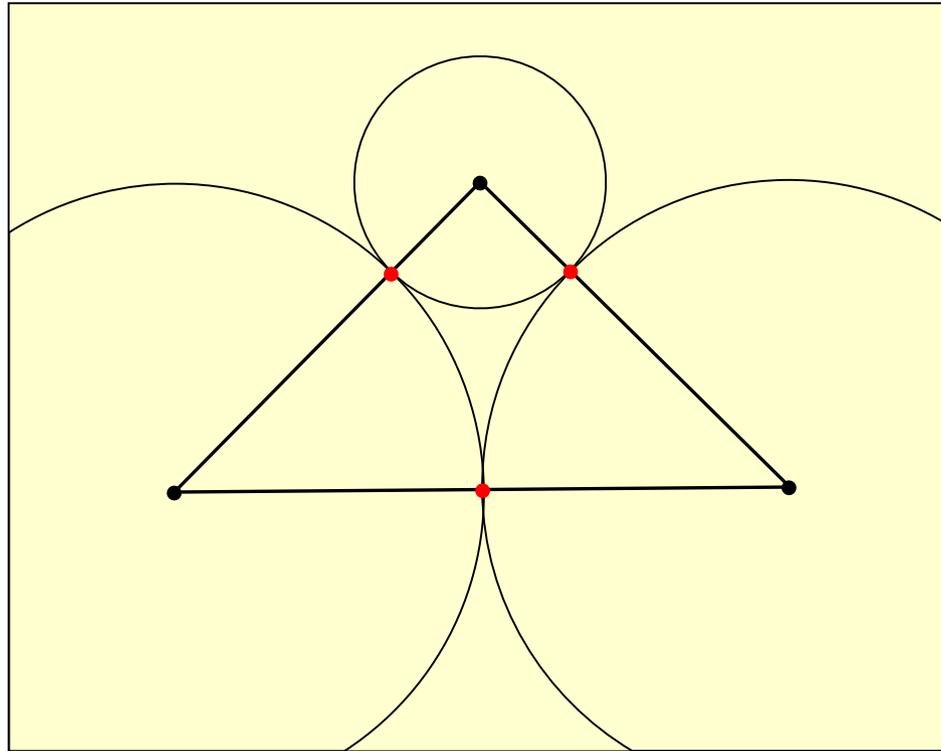
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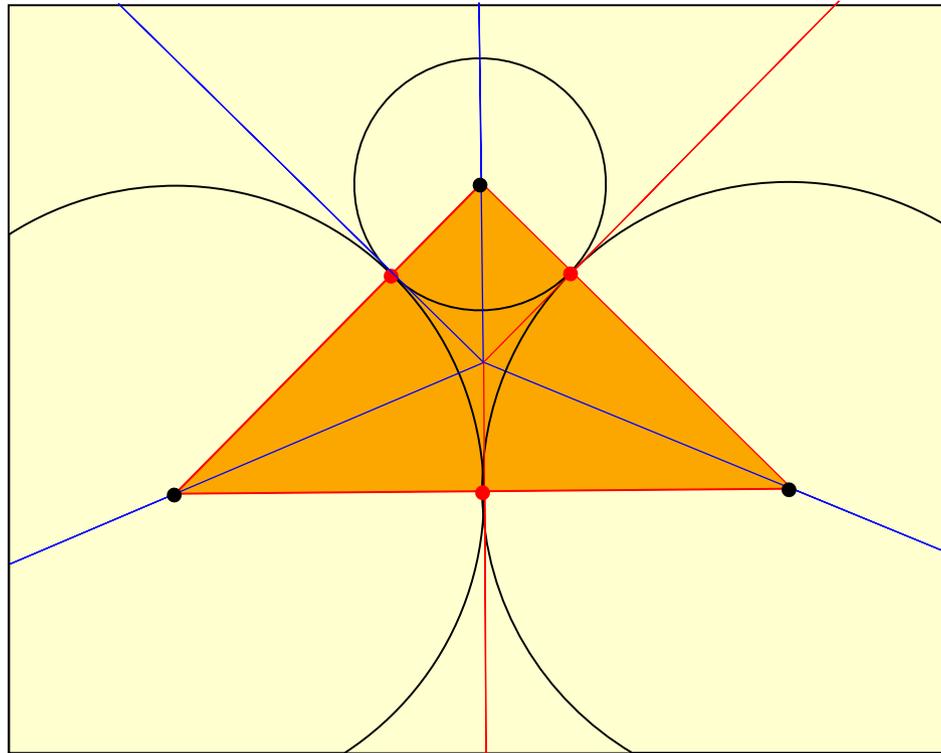
# Análise das dobras



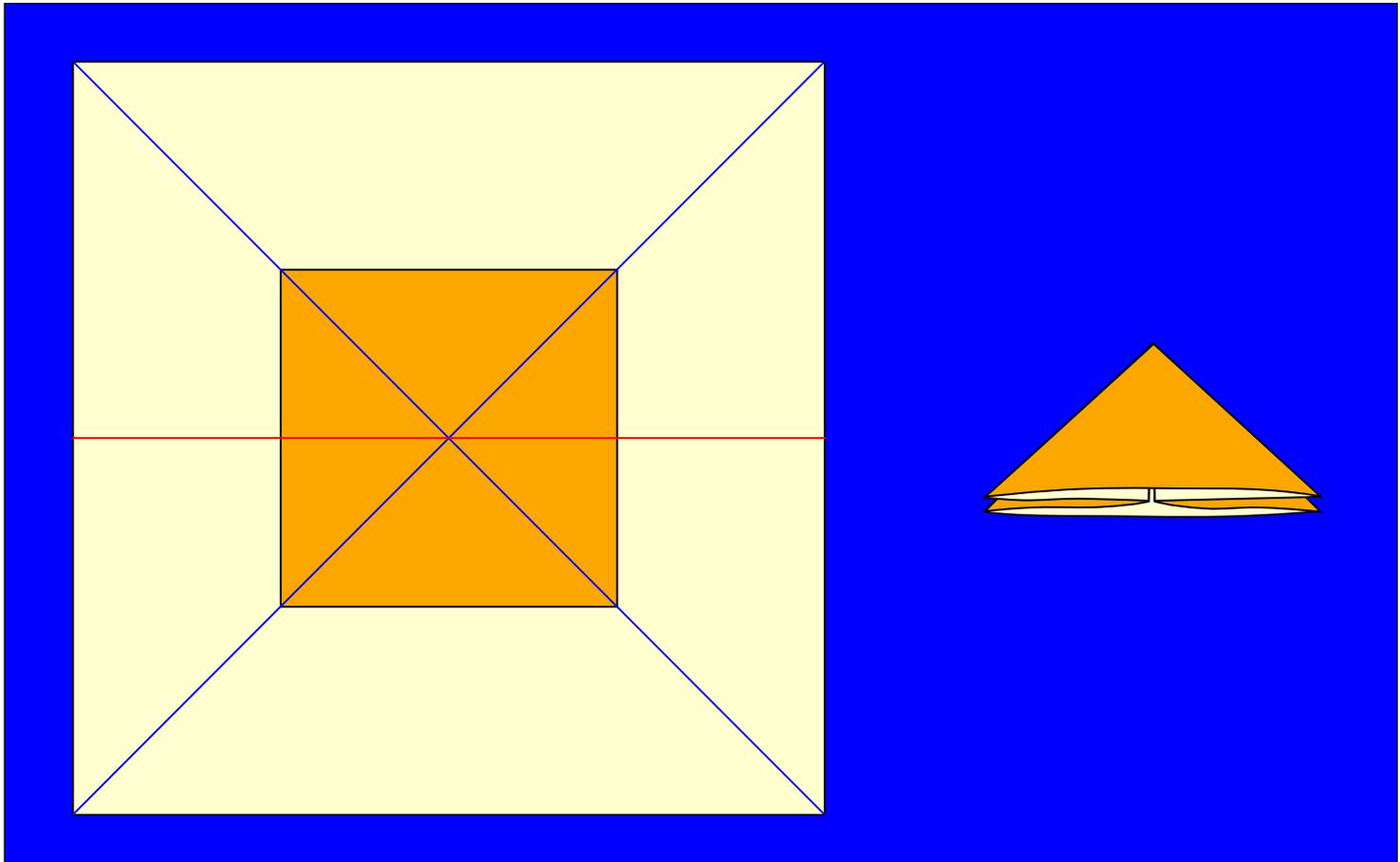
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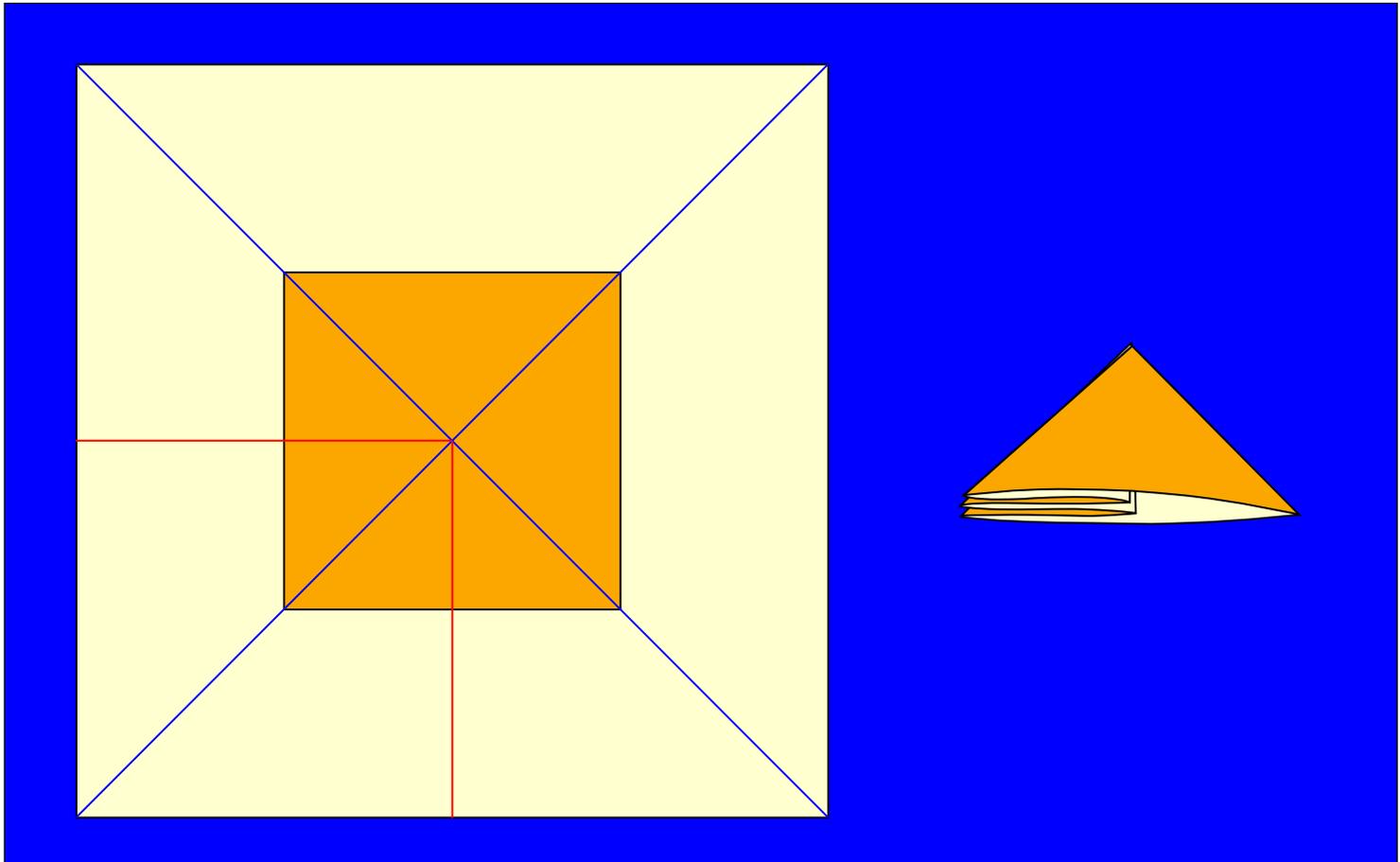
# Análise das dobras



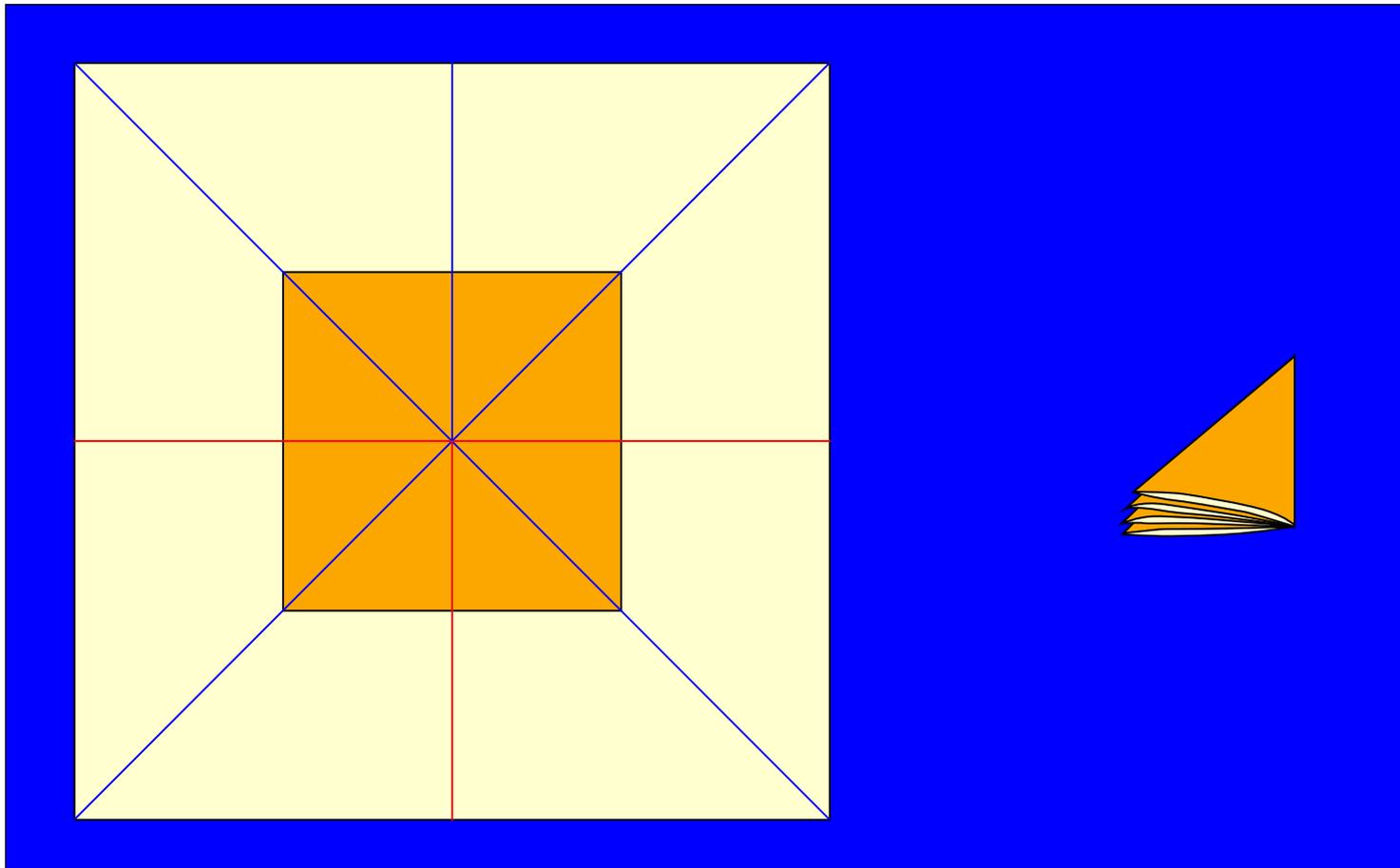
# Dobrando quadrados



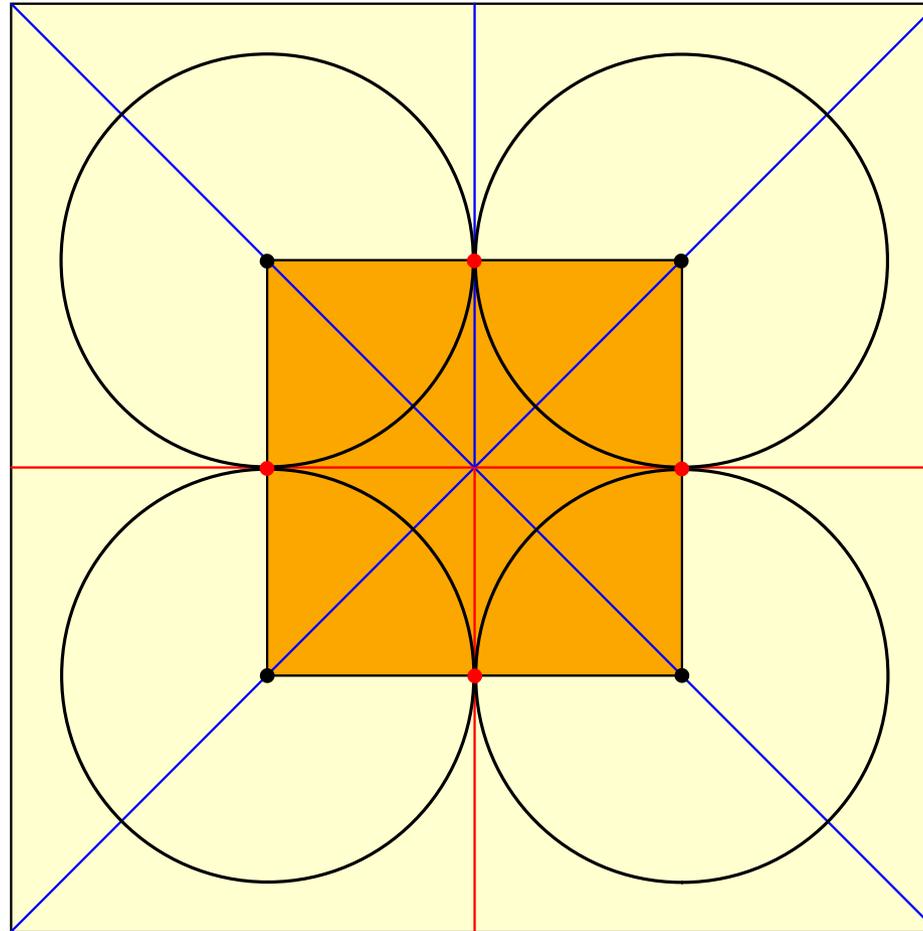
# Dobrando quadrados



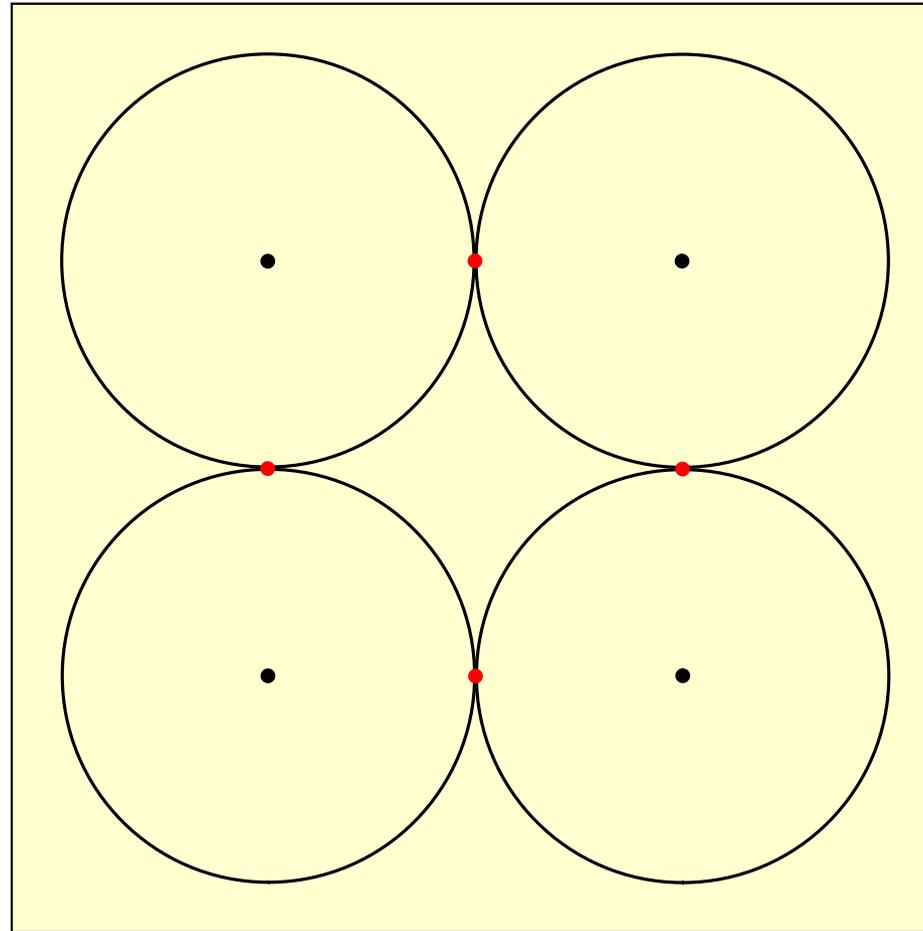
# Dobrando quadrados



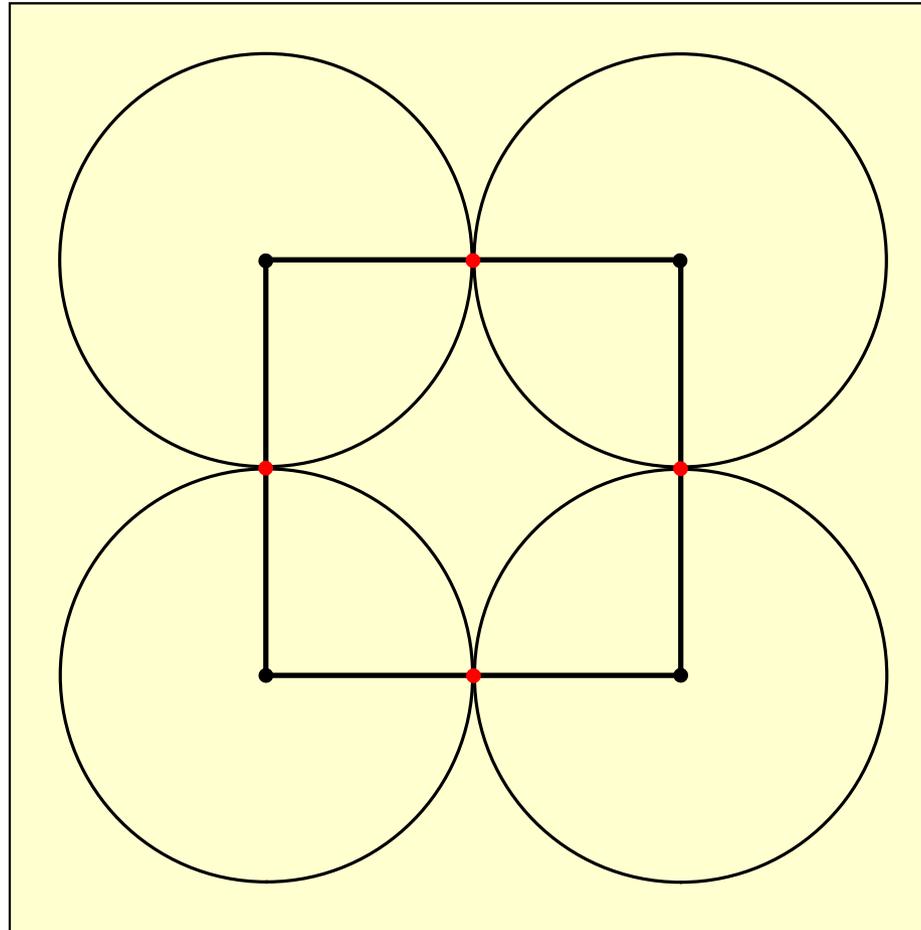
# Análise das dobras



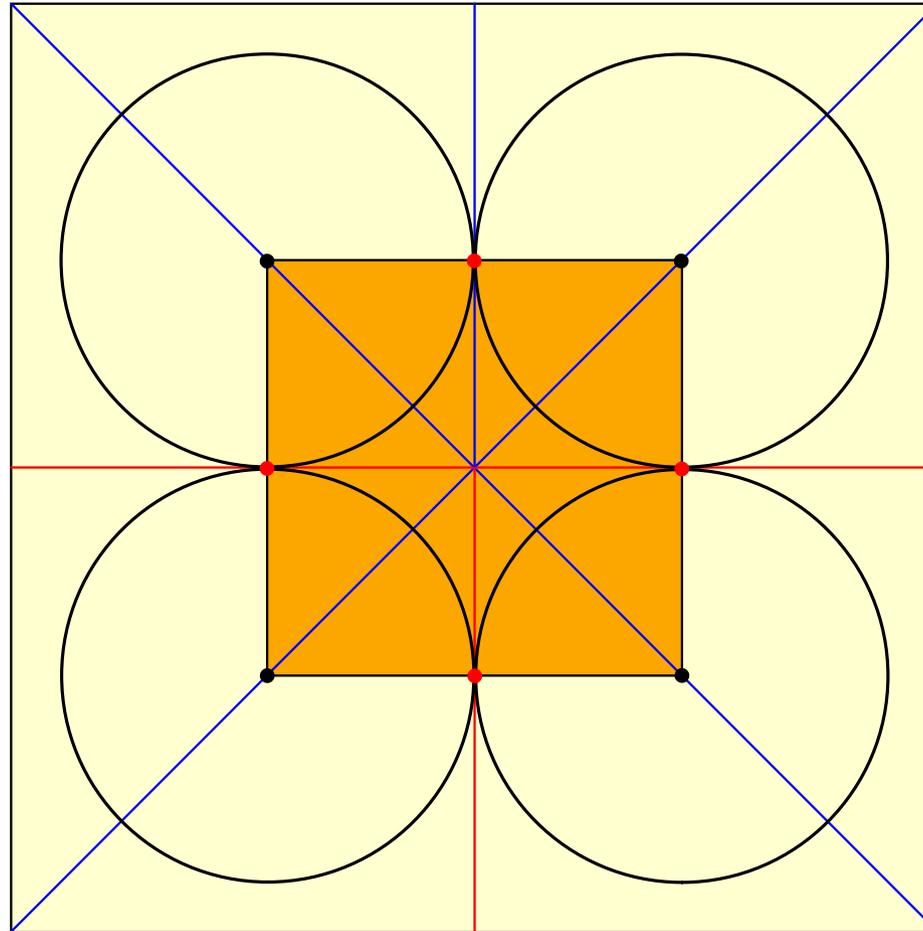
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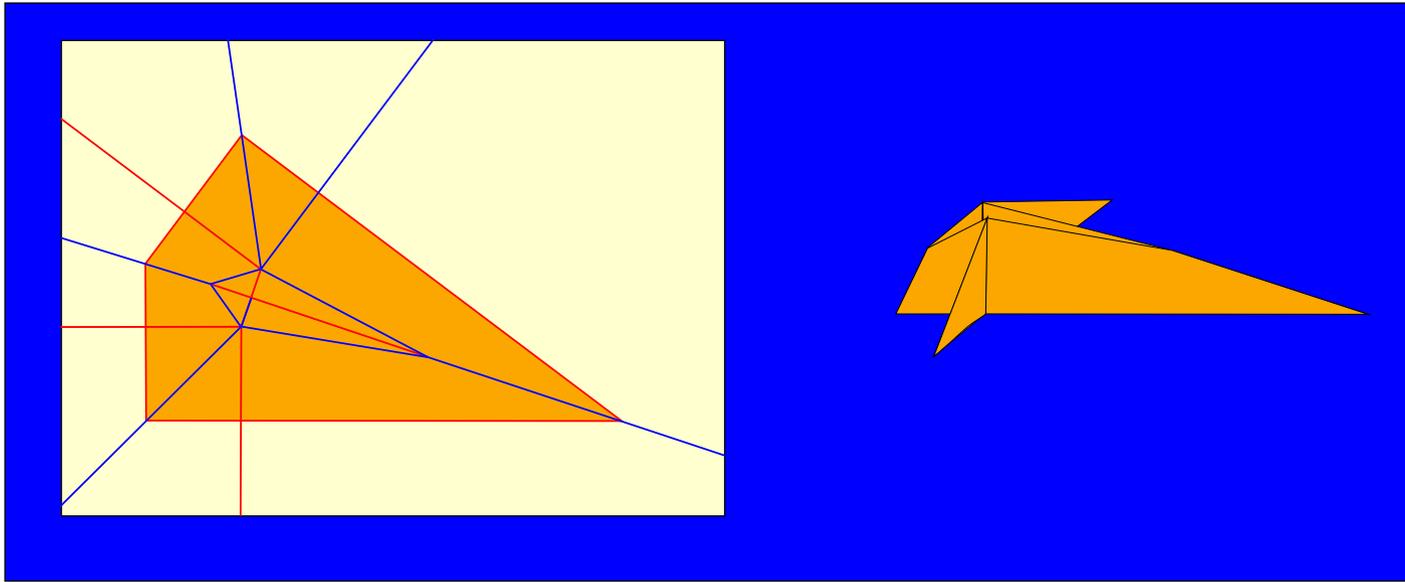
# Análise das dobras



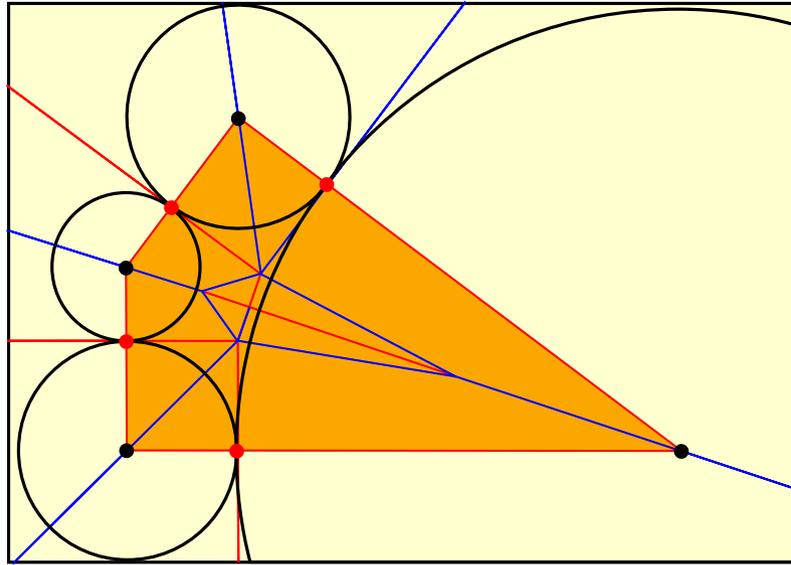
# Análise das dobras



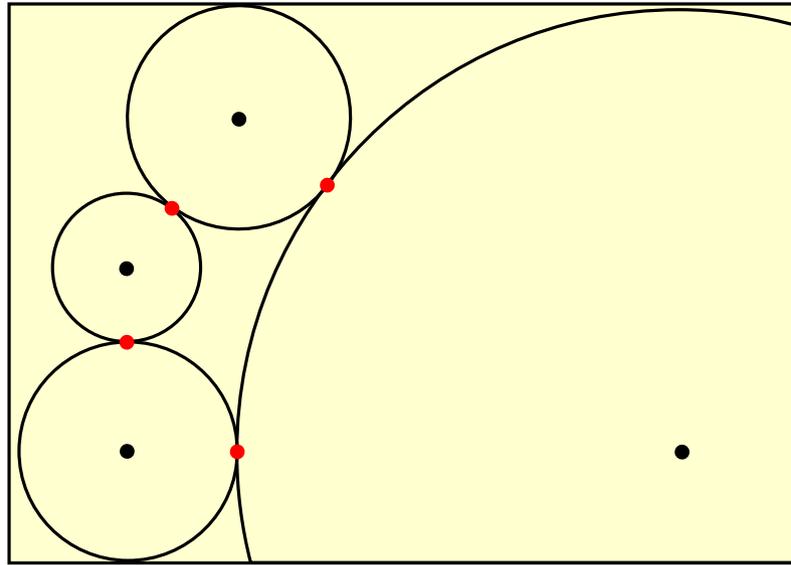
# Dobrando quadriláteros



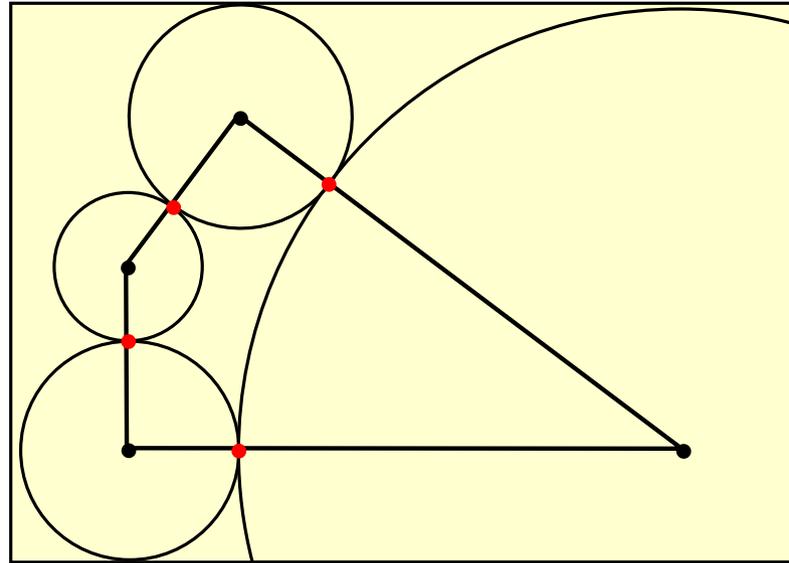
# Análise das dobras



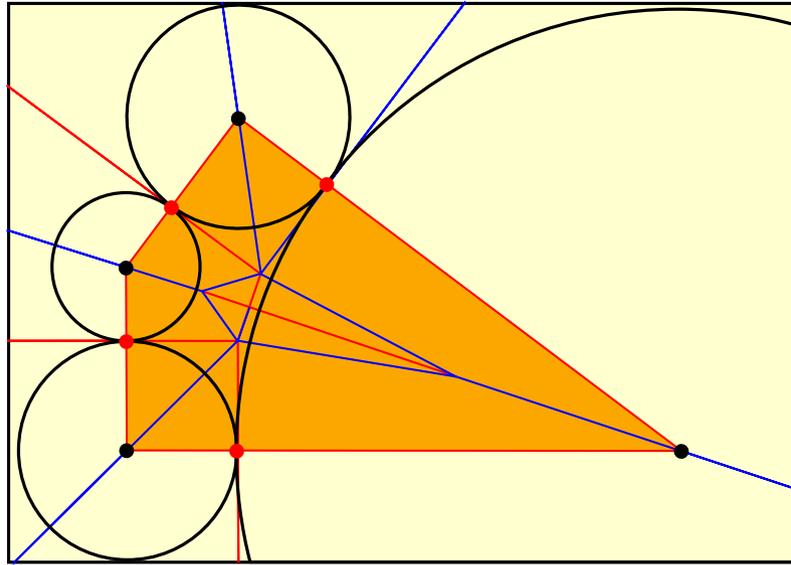
# Análise das dobras



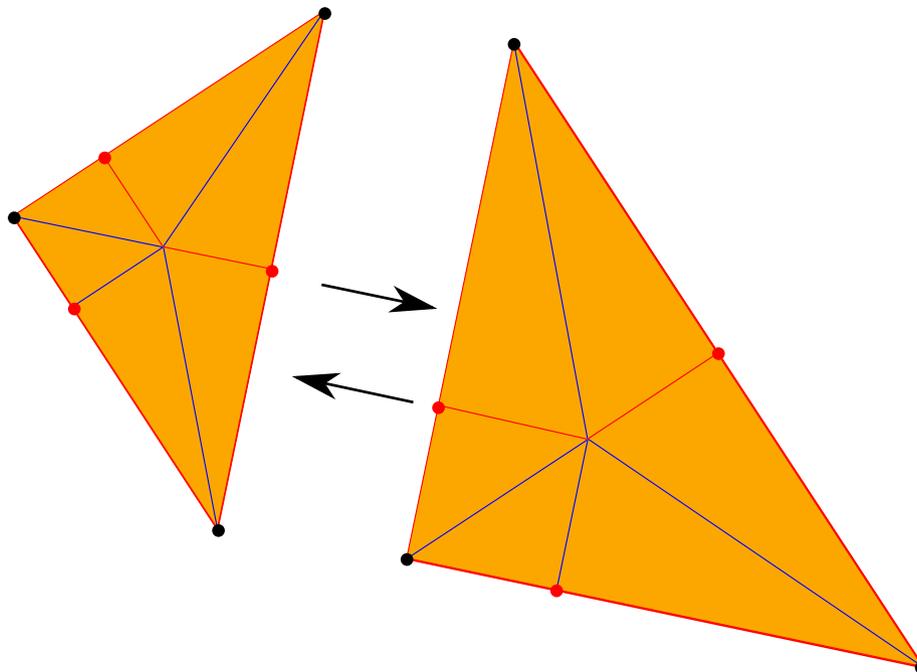
# Análise das dobras



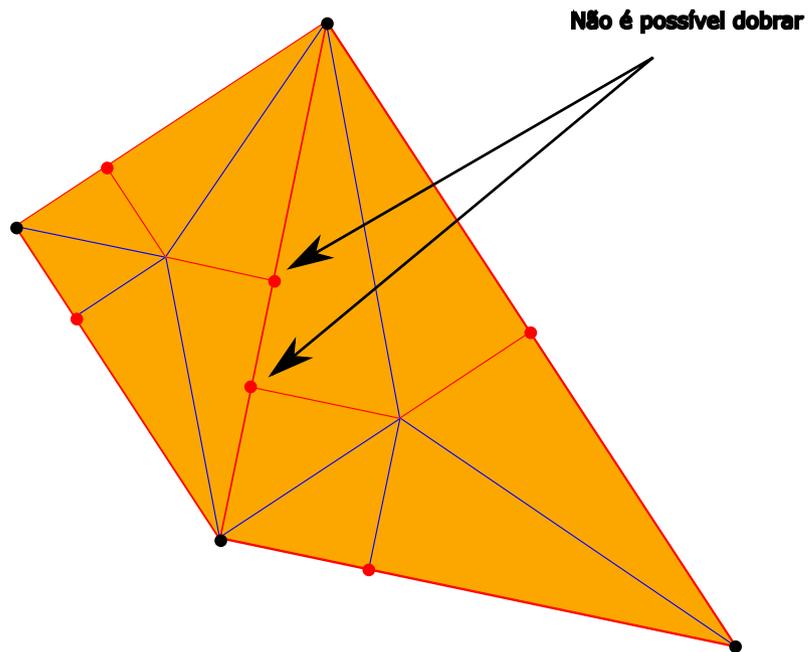
# Análise das dobras



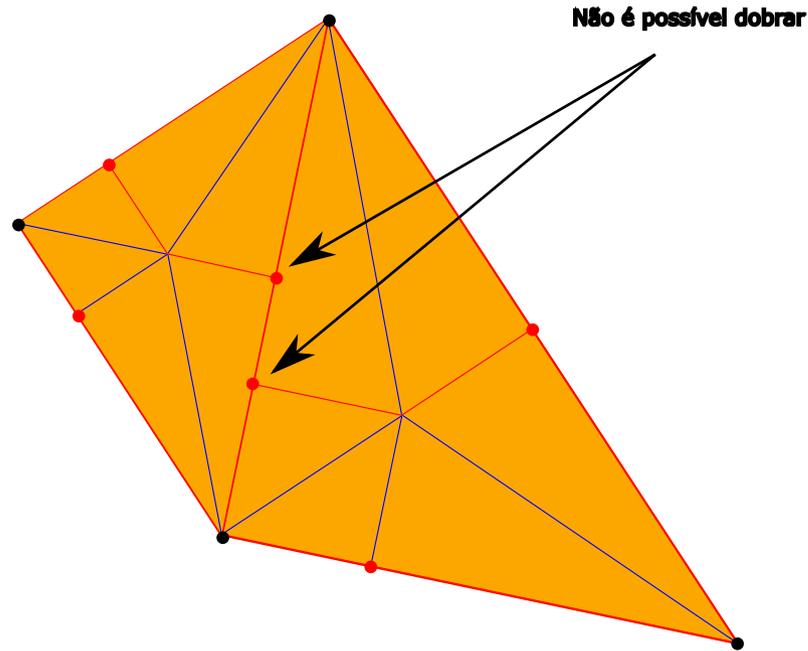
# Juntando Moléculas



# Juntando Moléculas

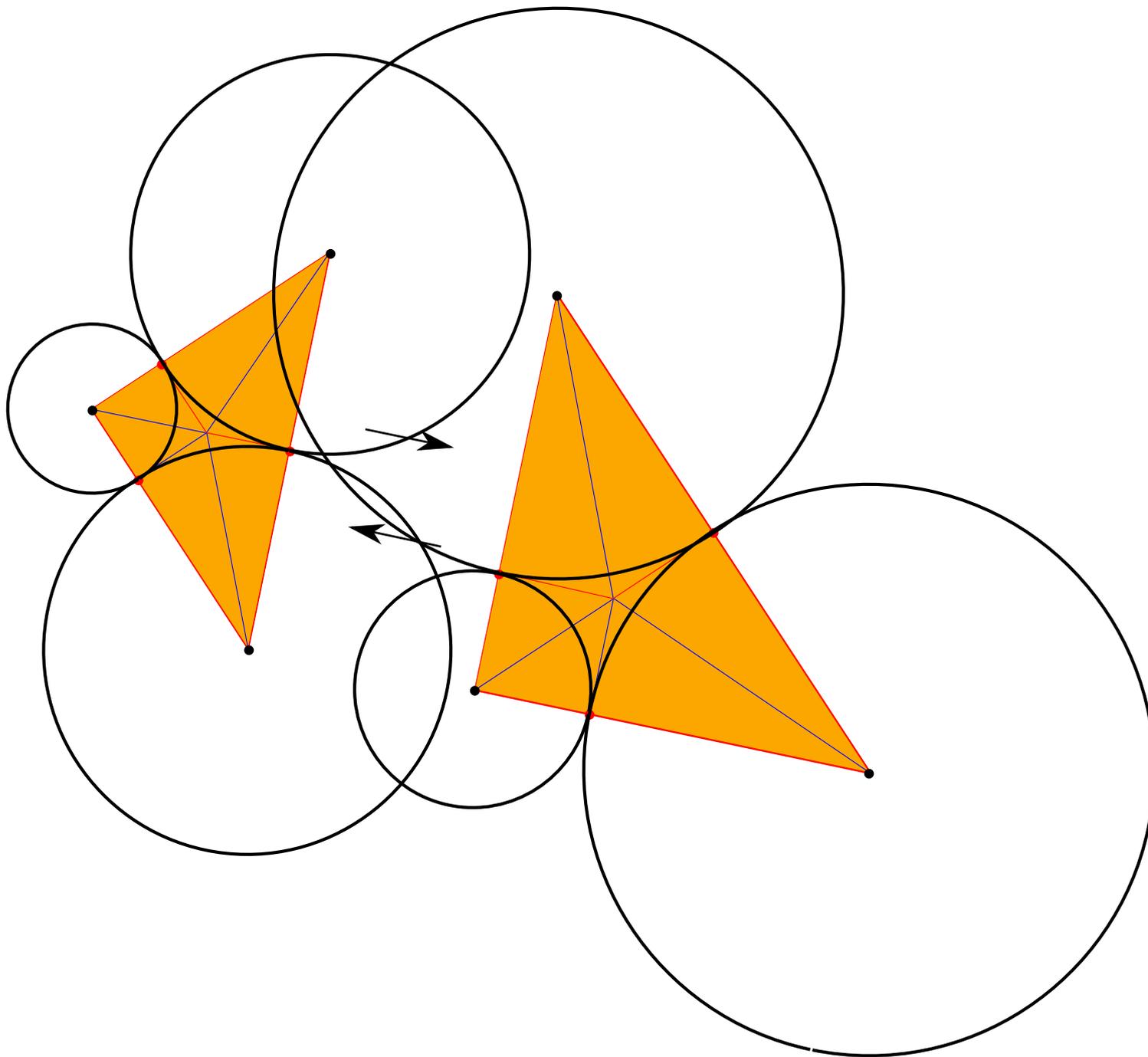


# Juntando Moléculas

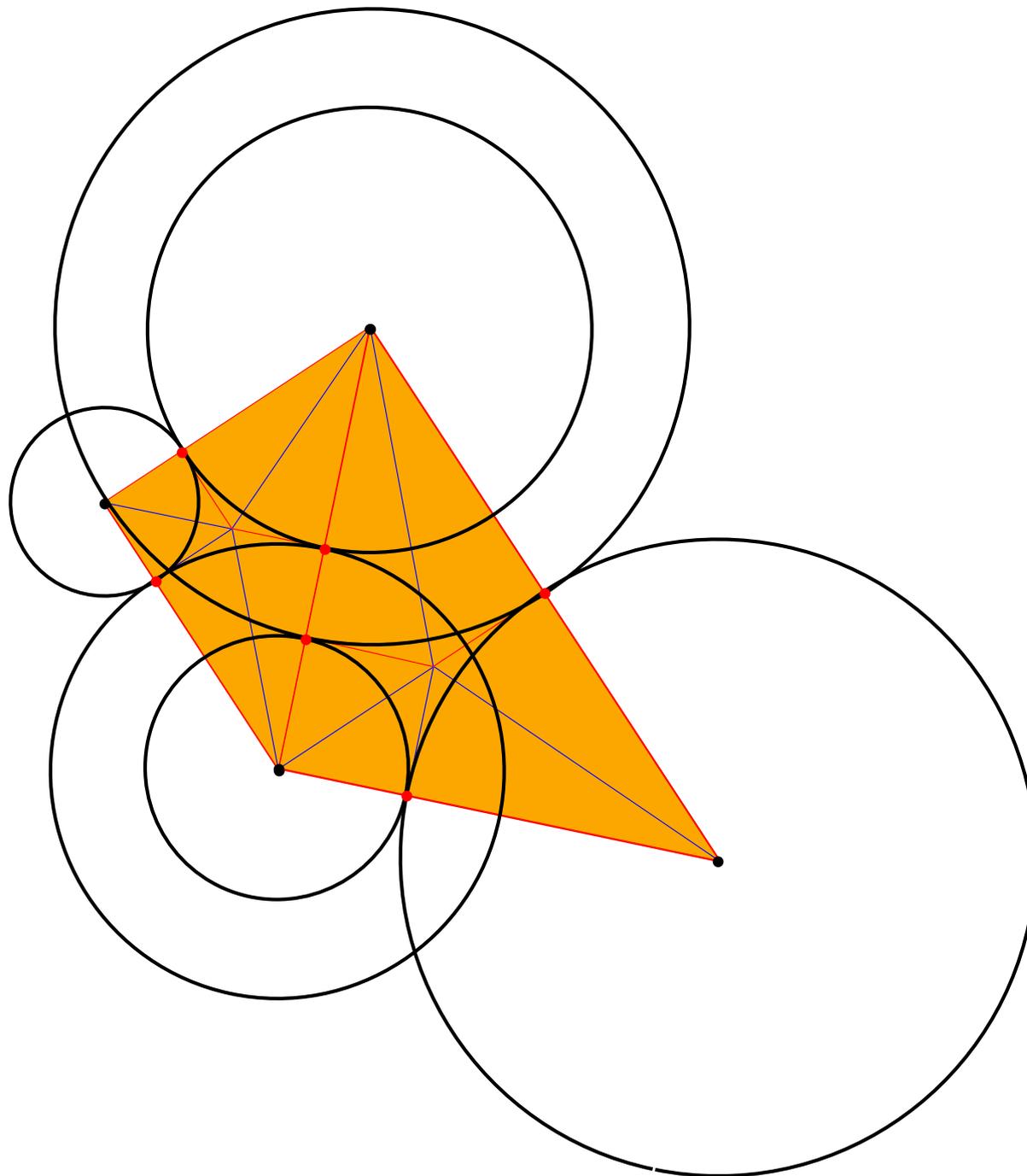


O teorema de Maekawa diz que o número de dobras do tipo montanha menos o número de dobras do tipo vale que incidem em cada vértice deve ser igual a 2 ou -2. Então podemos mostrar que o número de dobras em um vértice deve ser par.

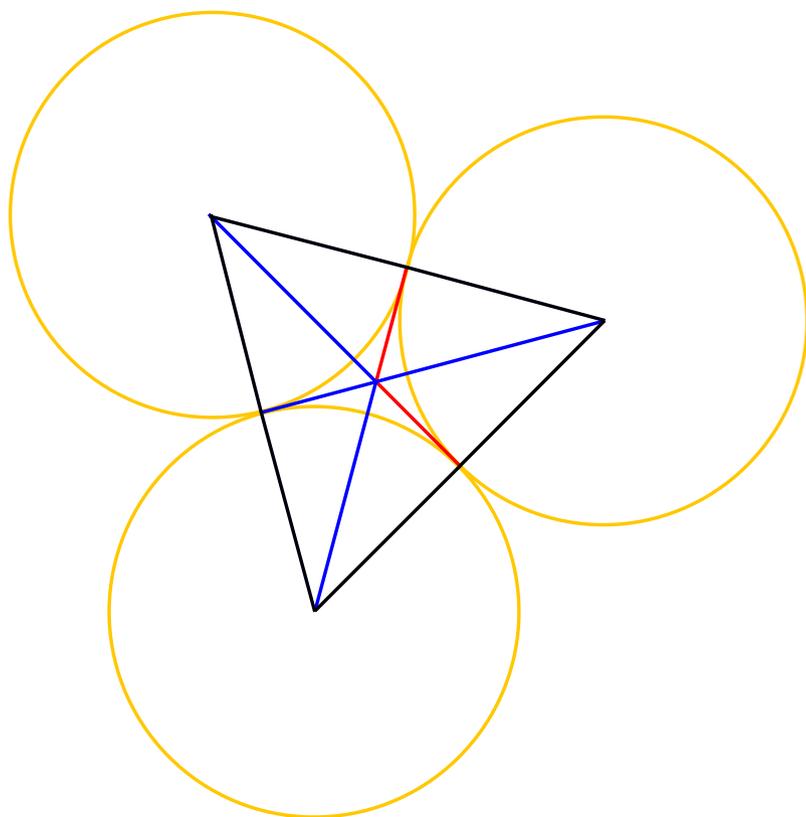
# Juntando Moléculas



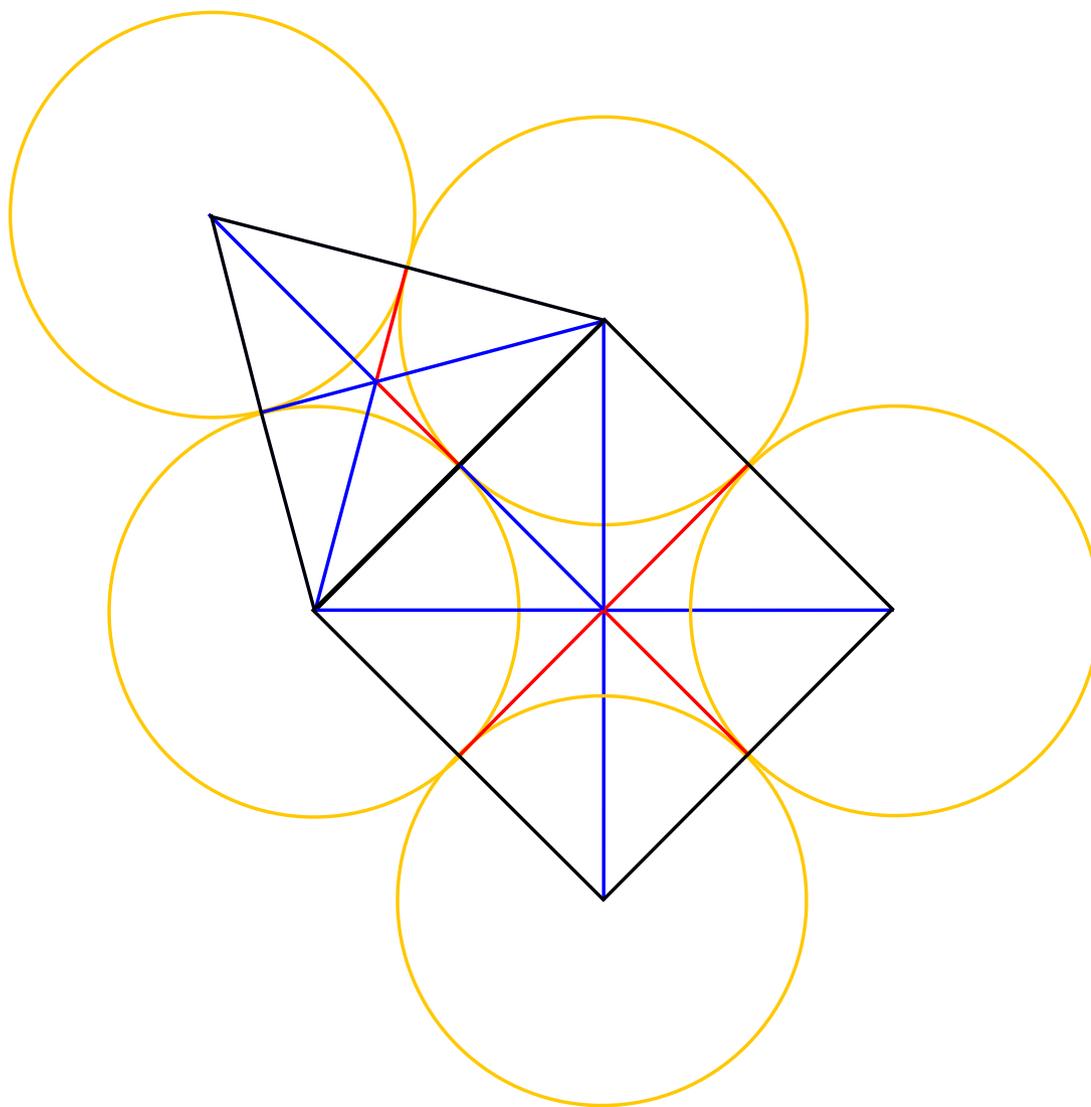
# Juntando Moléculas



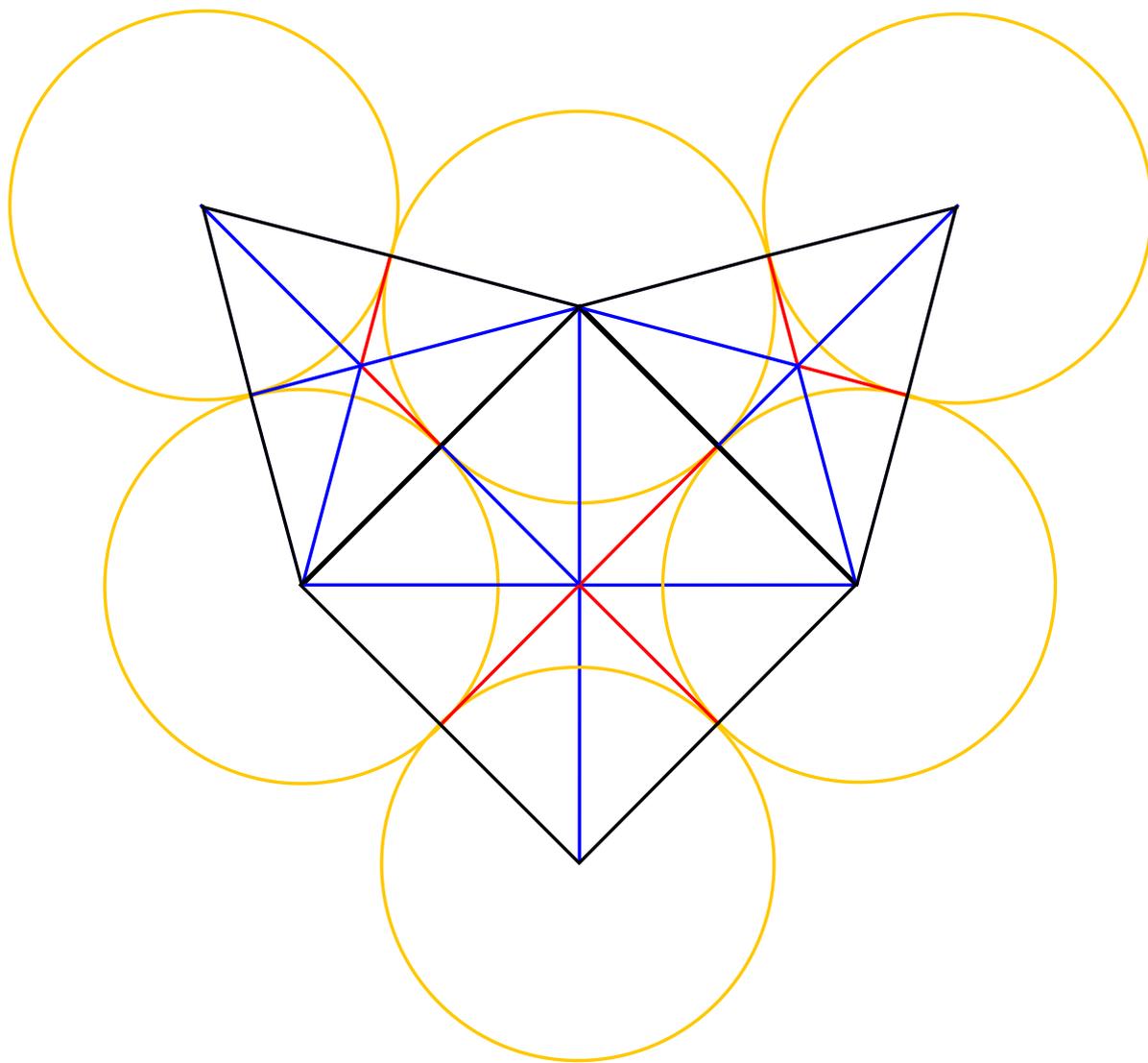
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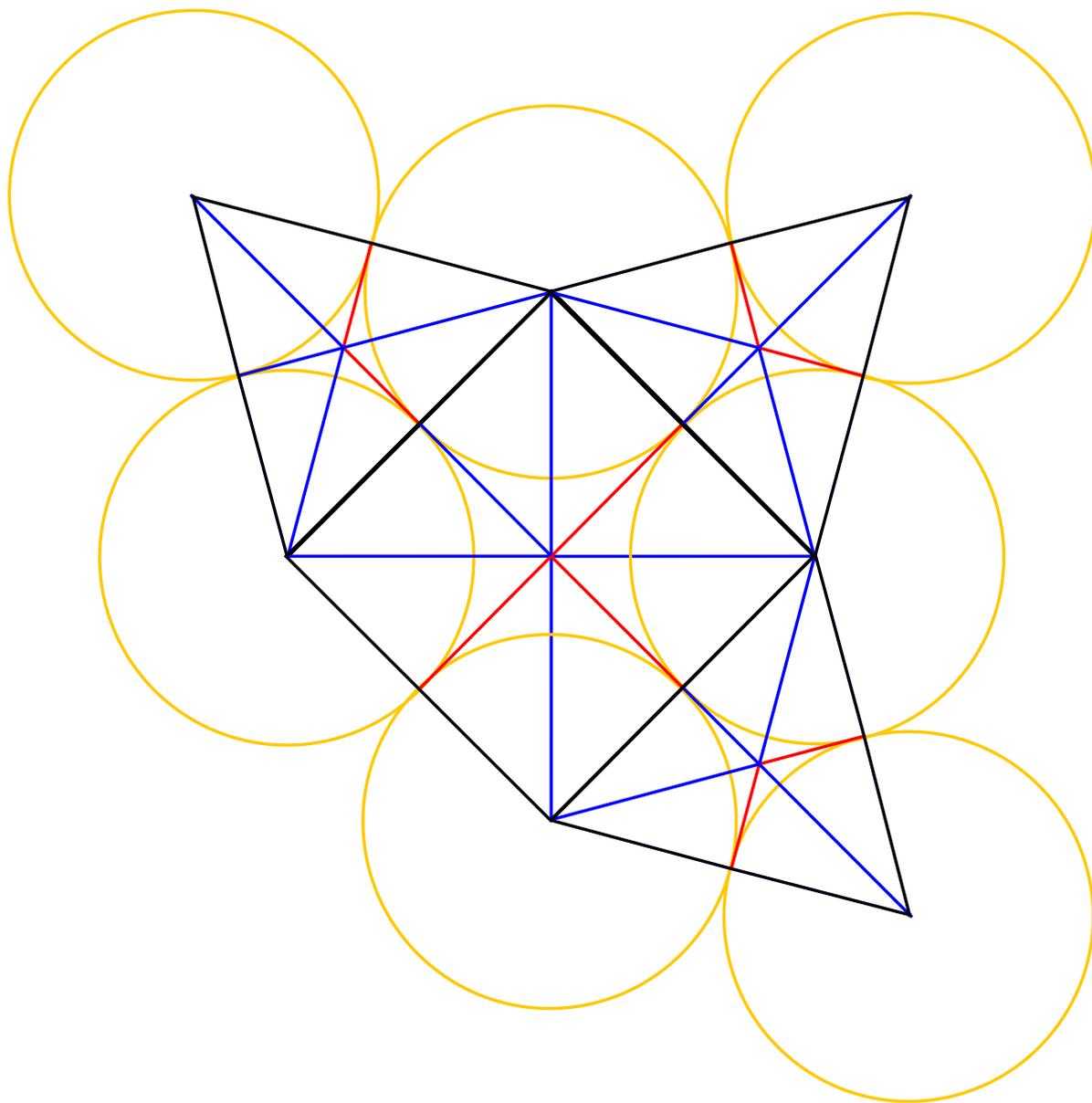
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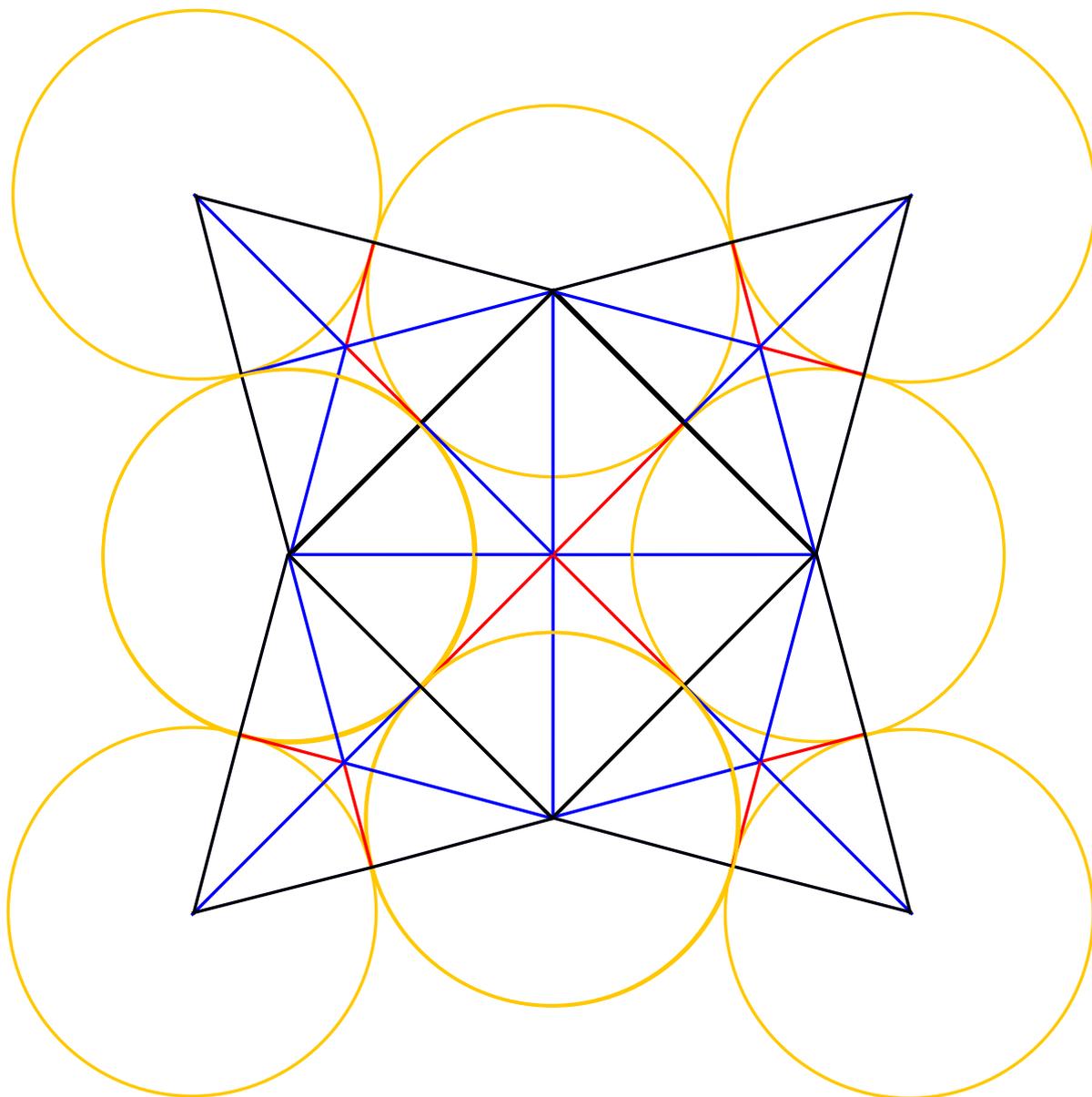
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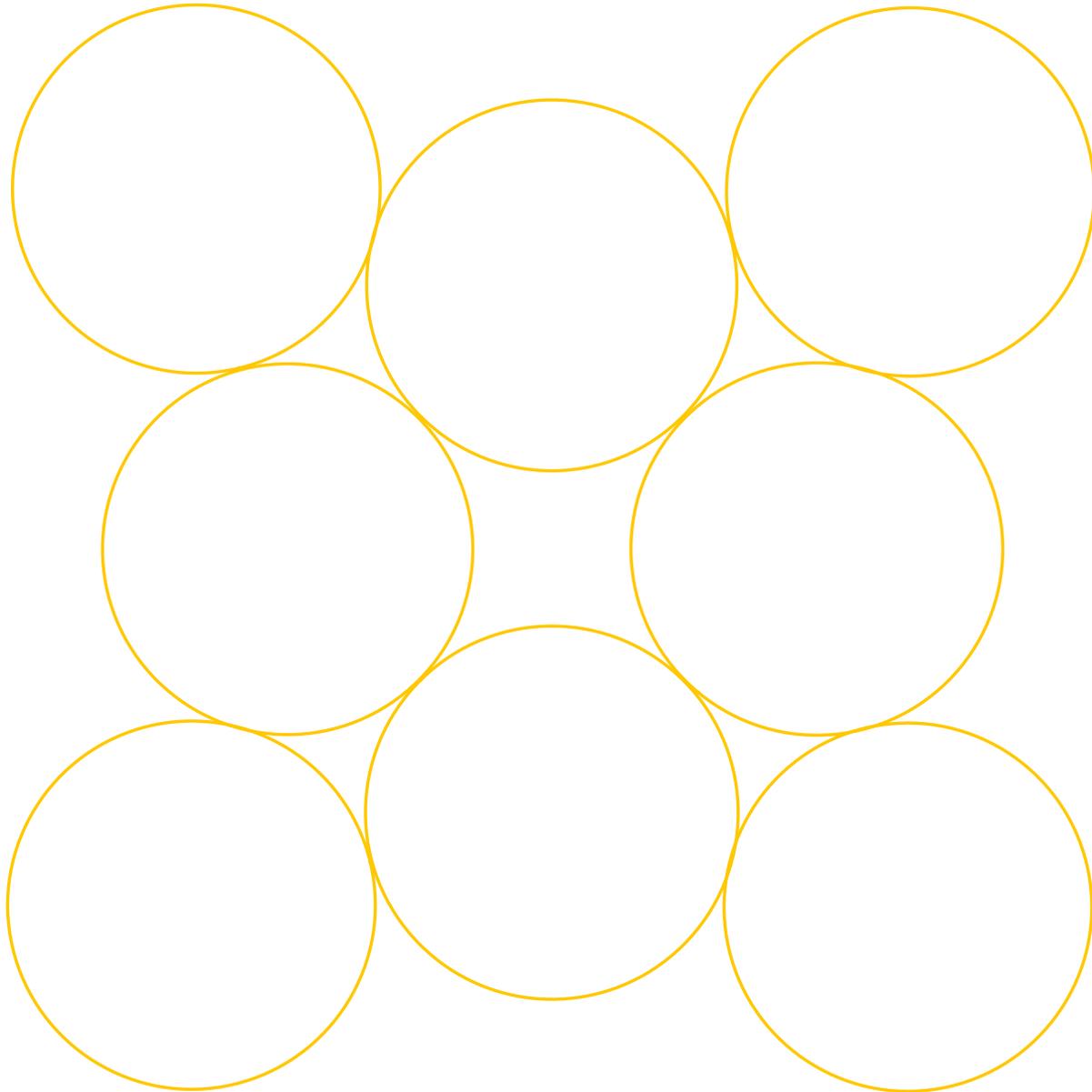
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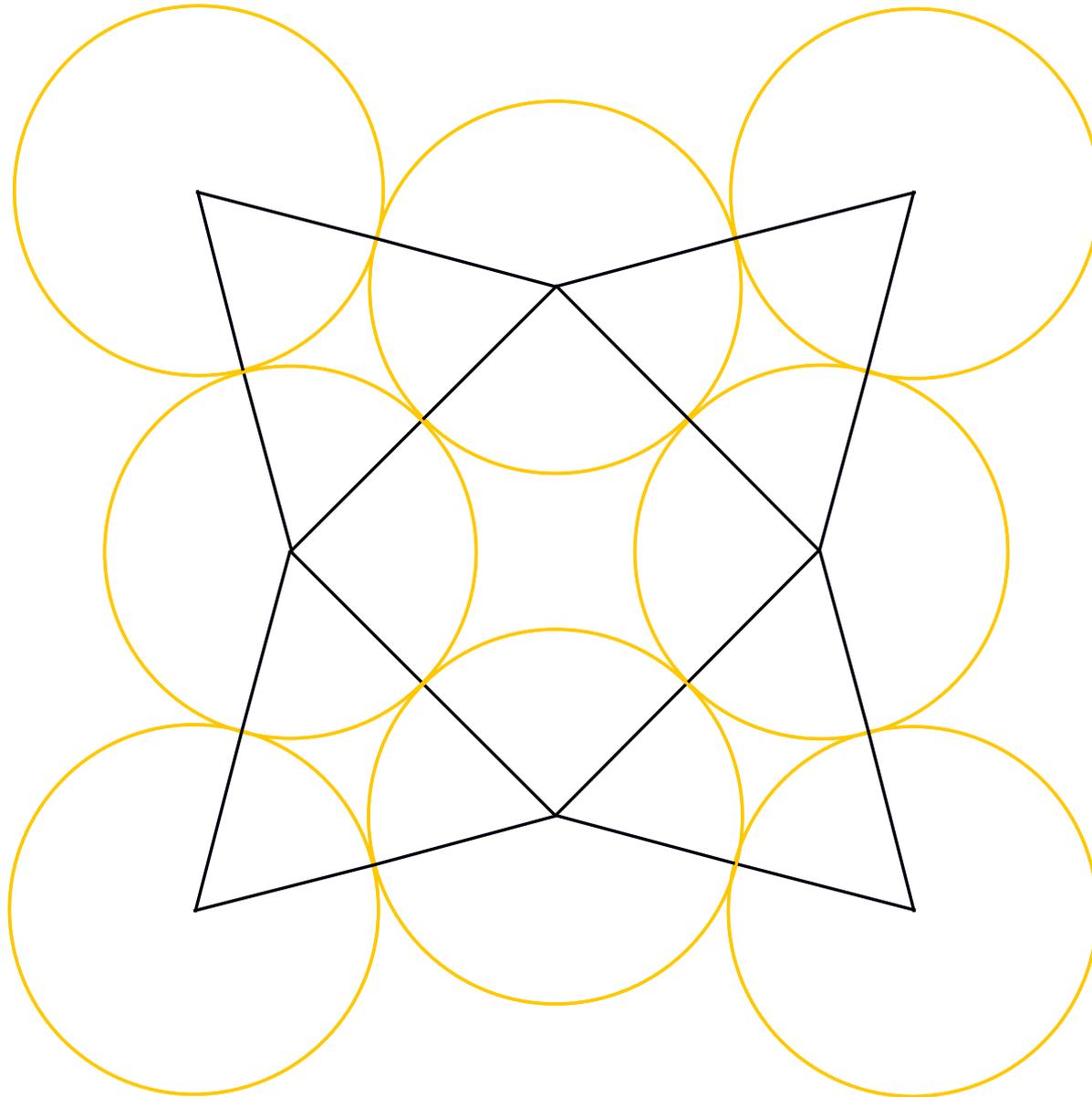
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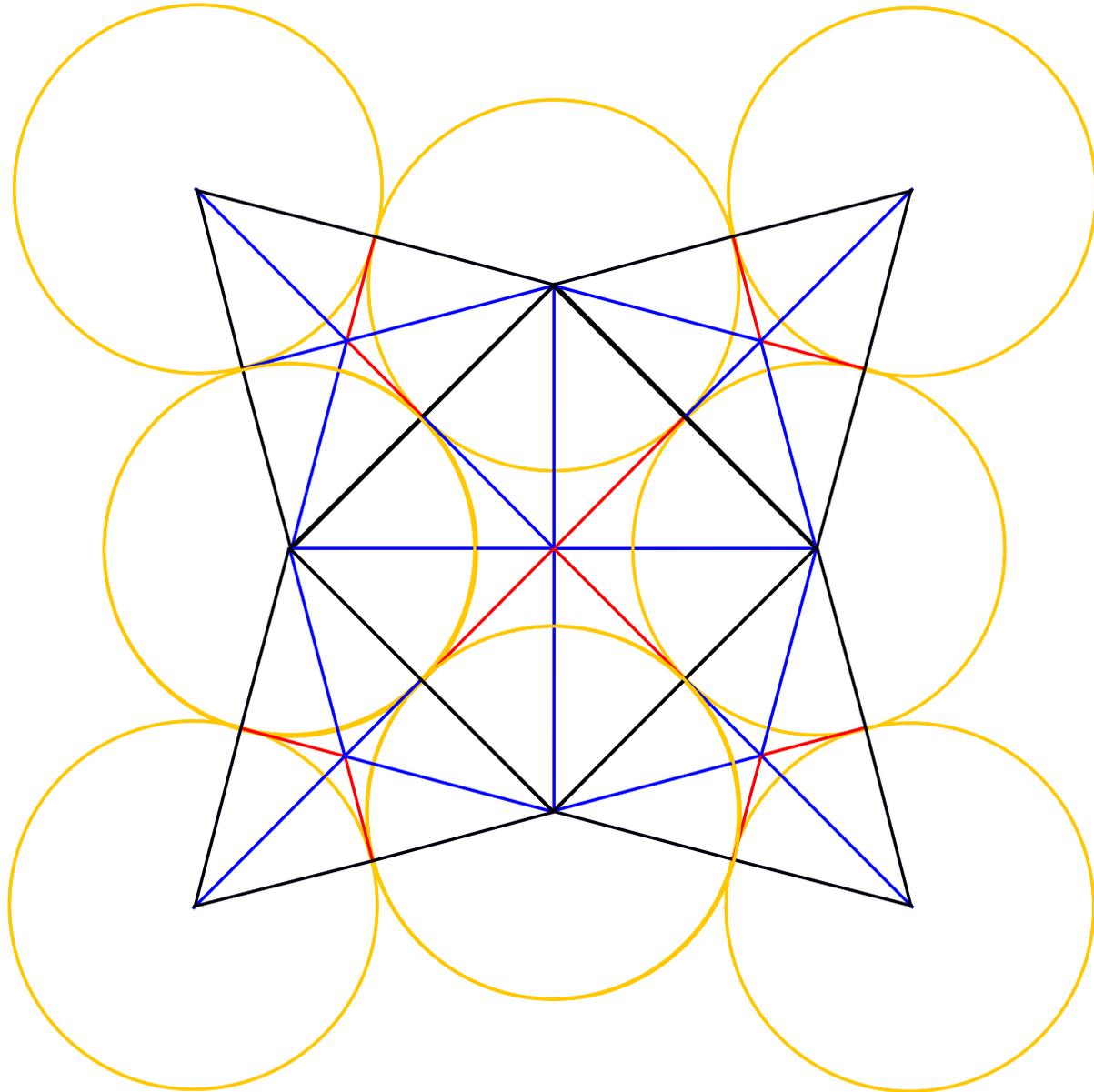
# Discos



# Discos



# Discos



# Algoritmo

## A disk-packing algorithm for an origami magic trick

Constrói um empacotamento de discos que particiona o polígono em triângulos e quadriláteros.

Marshal Bern, Erik Demaine, David Eppstein e Barry Hayes

## Implementação

Disponibilizamos a implementação para este algoritmo no Google Code sob o projeto JOrigami.

# Esqueleto da base

