

XXII

Erematsul

Curitiba, 21-23 julho 2016

**CALEIDOCICLO: MONTAGEM
E CONTEÚDOS QUE PODEM
SER DESENVOLVIDOS**

Luana Leal

Sirley S. C. Siqueira

O QUE É?

O termo **caleidociclo** vem de

kalós (belo) + *eidos* (forma) + *kyklos* (ciclo)

Ou seja, podemos pensar que um caleidociclo seja uma bela forma cíclica.

Ele é constituído por uma cadeia de *tetraedros*, como se fosse um anel que podemos girar infinitas vezes, geralmente são construídos em papel.

Quando giramos o caleidociclo de dentro para fora ou de fora para dentro, a cada giro forma-se uma figura diferente.

Os caleidociclos são utilizados tanto na arte como também no ensino.

COMO SURTIU?

- Wallace Walker, durante o trabalho num projeto para formas estruturais de papel, inventou uma construção, nomeando-a de IsoAxis, que consistia em um anel tridimensional capaz de girar em torno de si mesmo, completando ciclos.
- Nomeação - Doris Schattschneider, anos mais tarde e após muito estudo.
- 1991 – “*Problema de Escher*”

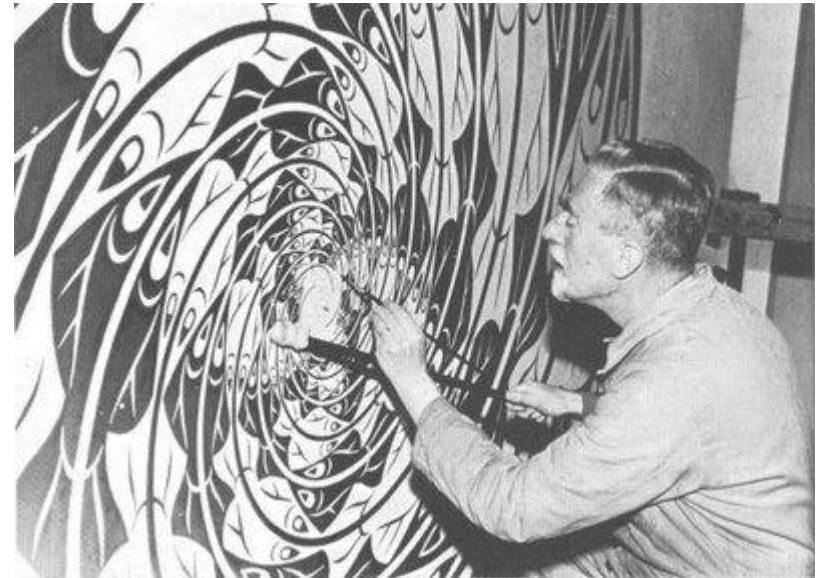
“Problema de Escher”

- Na busca de resolver o problema da representação de uma superfície pavimentada infinita, sem deformar as figuras, Schattschneider e Walker pensaram em recobrir os caleidociclos com as simetrias de Escher

<https://www.youtube.com/watch?v=-Wu1w1T03hw>

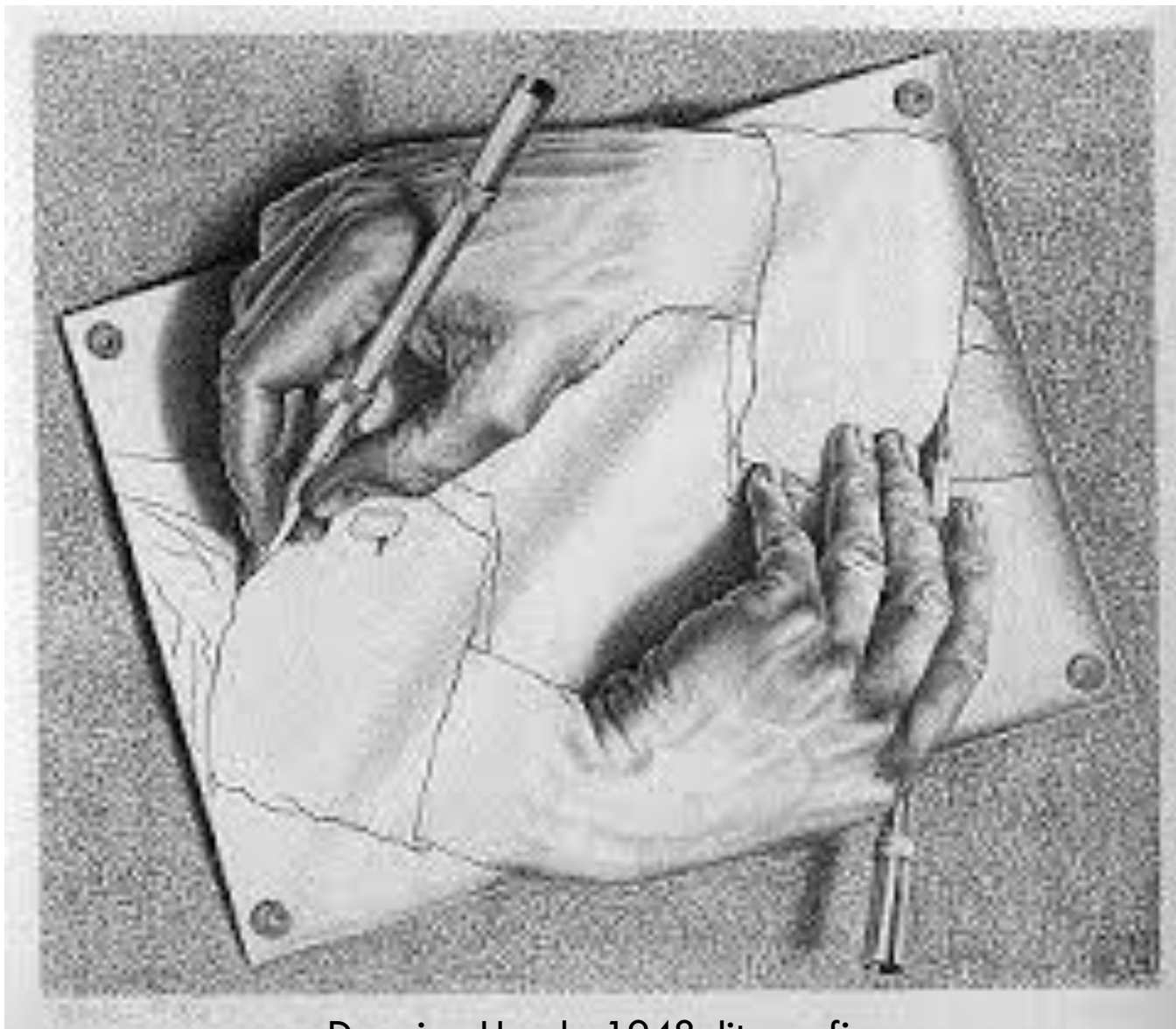
Quem foi Escher?

As suas obras são repletas de coisas subjetivas e o mais interessante em suas obras é a ilusão de ótica, que nos dá a impressão de dimensões jamais imaginadas na realidade.

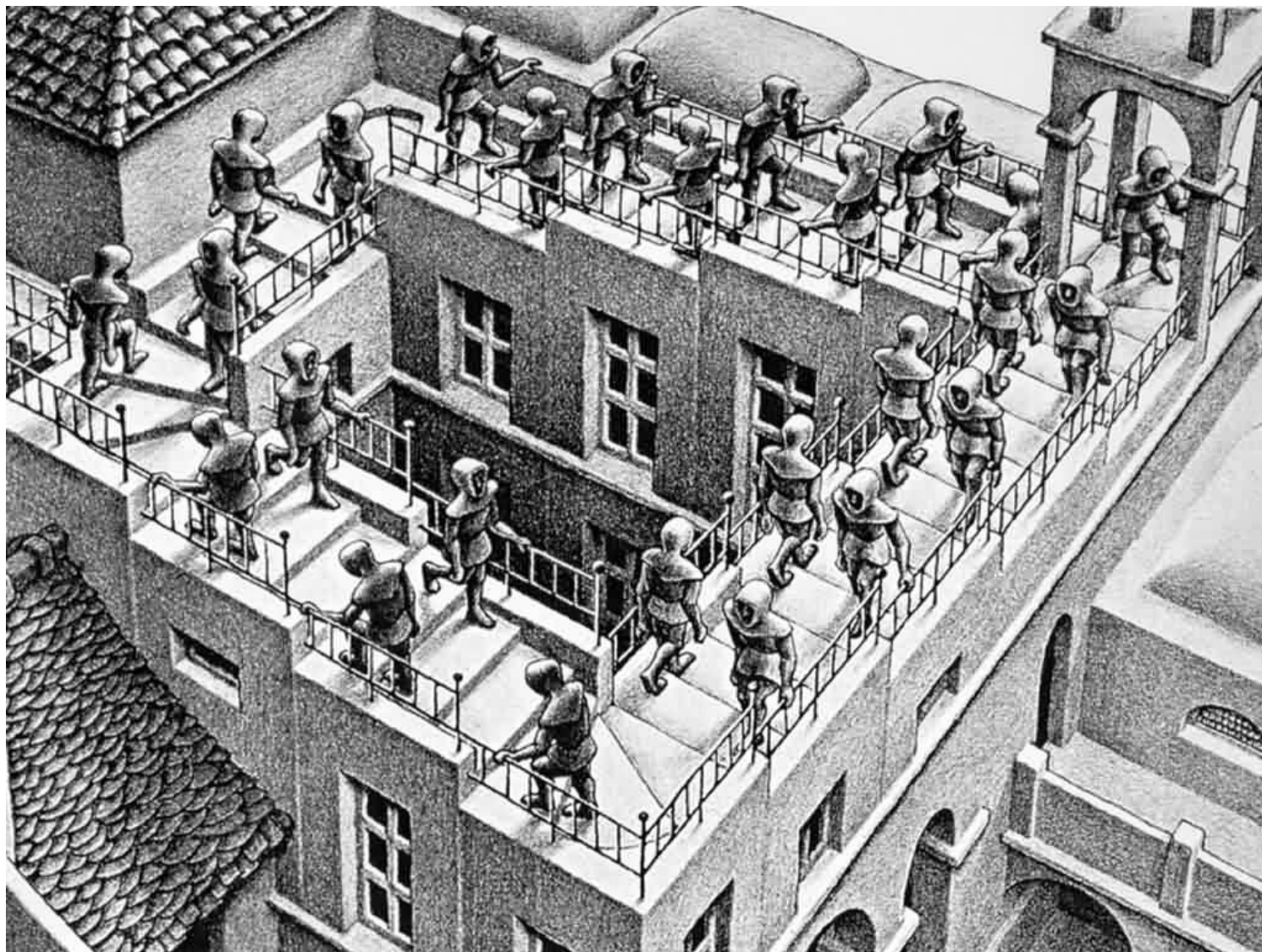


Veja mais em:

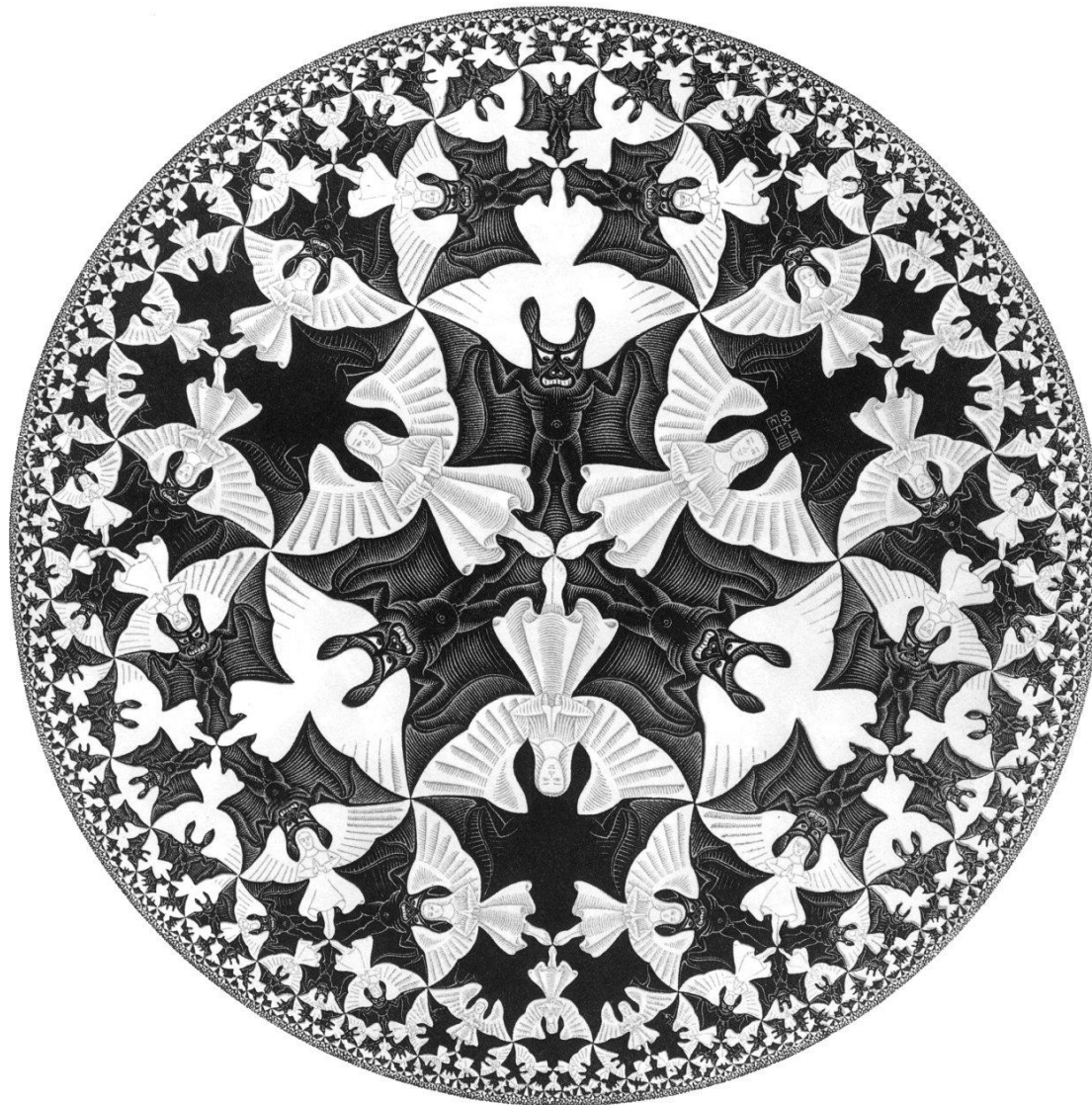
http://webeduc.mec.gov.br/portaldoprofessor/matematica/condigital2/midias/experimentos/Geometria_e_arte/historico.html



Drawing Hands, 1948, litografia



Ascending and Descending (sobe e desce), litografia de 1960.



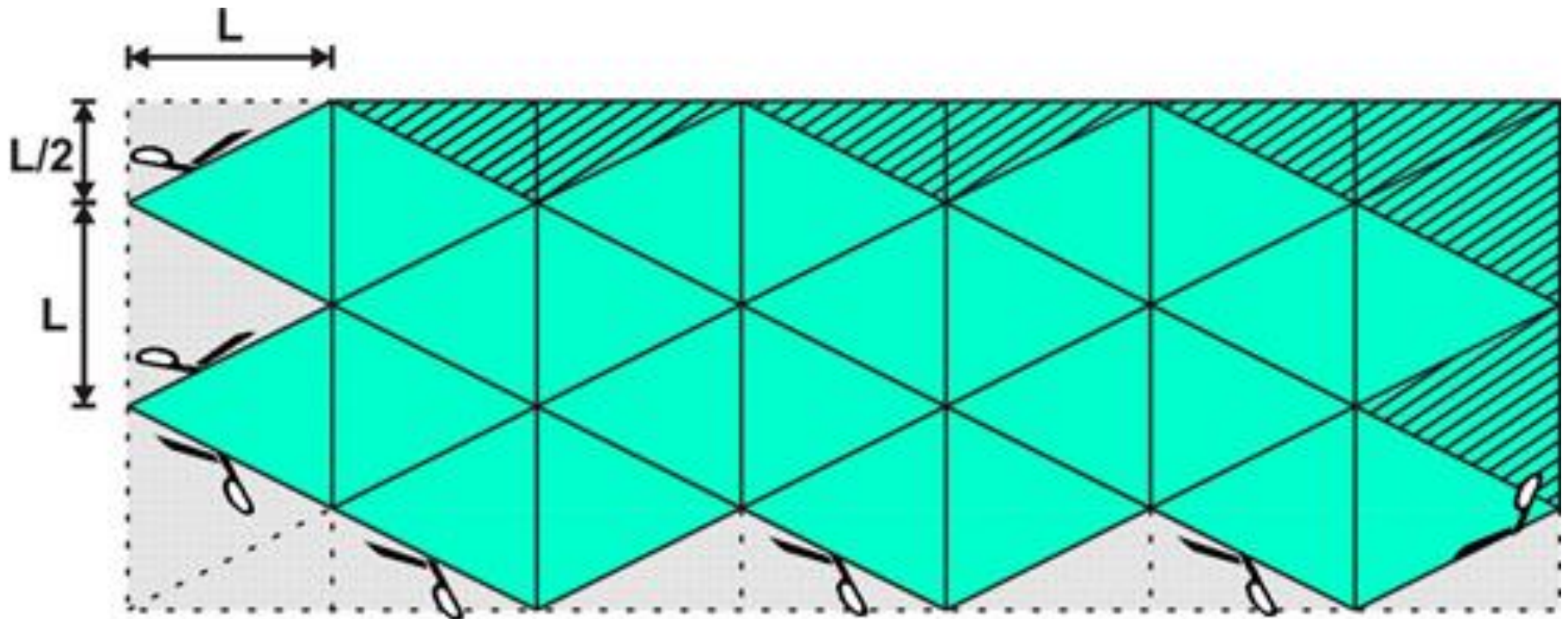
Circle Limit IV (Figura limitada por um círculo IV), 1960
xilogravura impressa em preto e ocre, a partir de 2 matrizes.

Tipos

Os mais conhecidos são:

- Caleidociclo hexagonal (caleidociclo de Escher);
- Caleidociclo quadrado;
 - <https://www.youtube.com/watch?v=eex-QV4HKGM>
- Caleidociclo contorcido.

Caleidociclo Hexagonal



$$4 \leq L \leq 8$$

Conteúdos

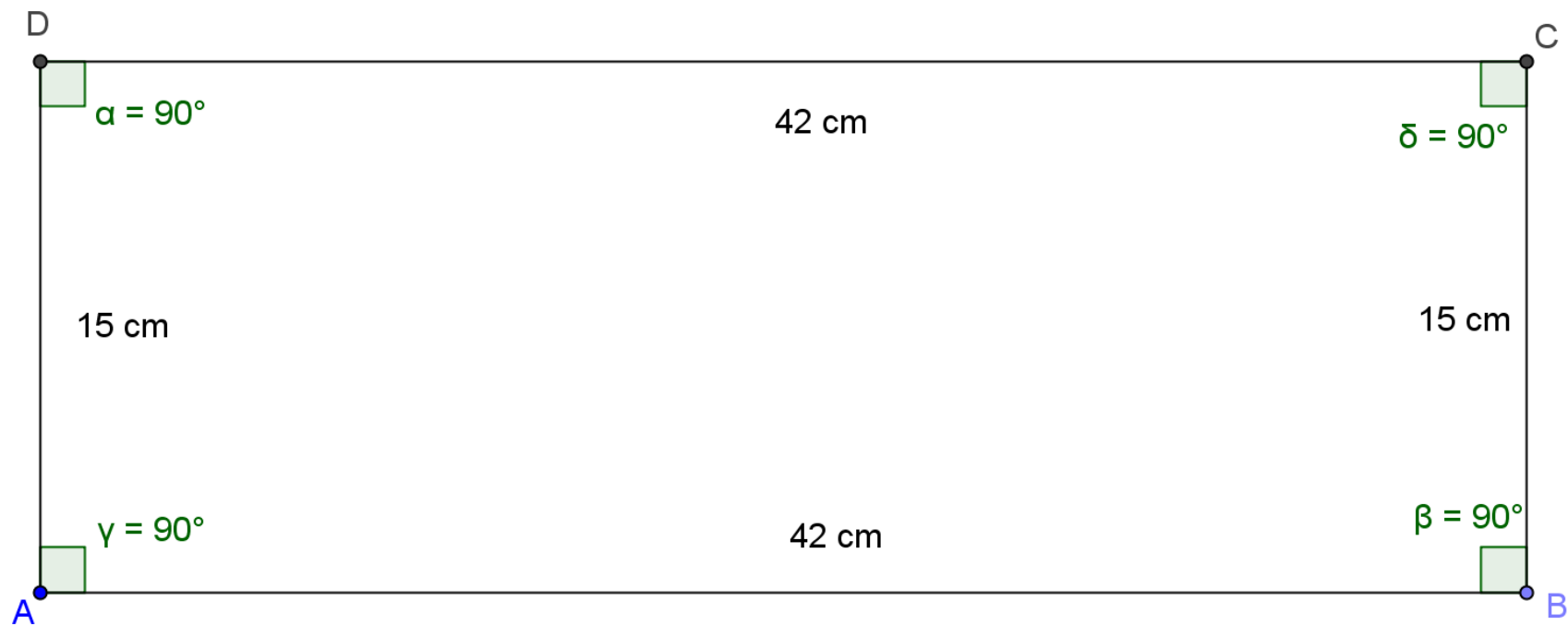
□ Geometria Plana

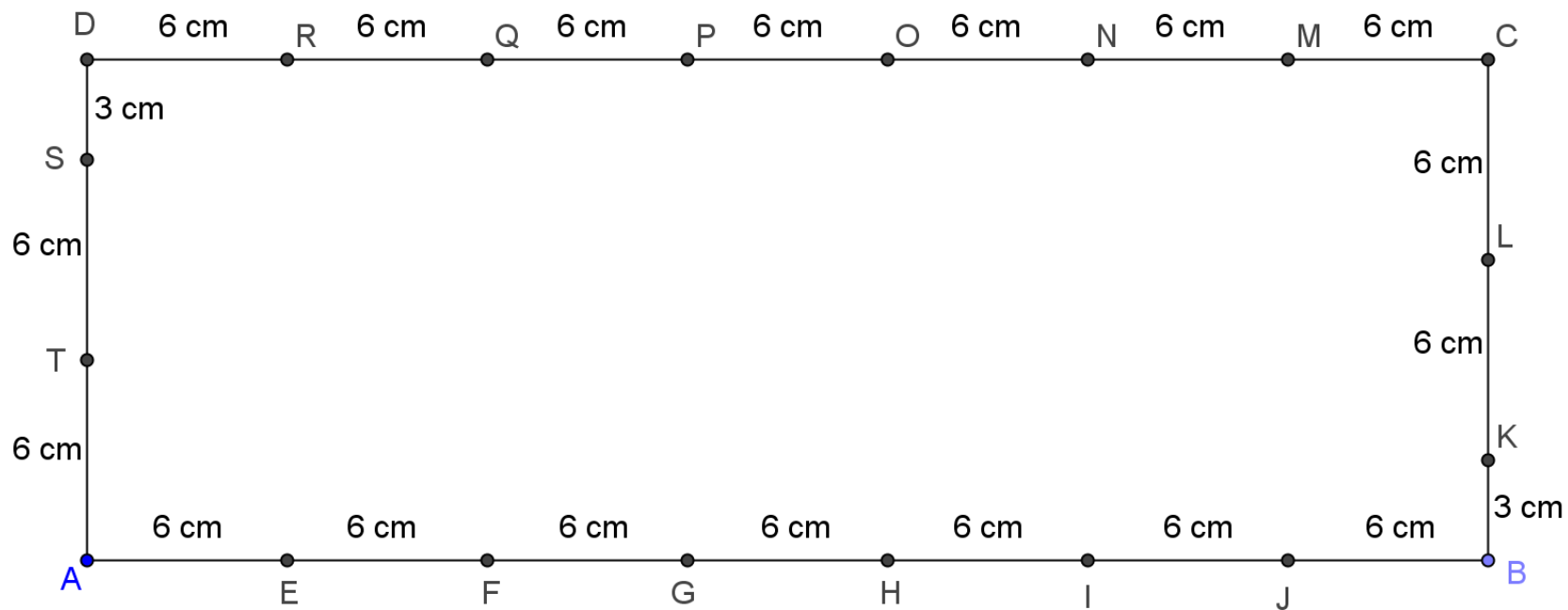
- Posição relativa entre retas
 - Retas concorrentes;
 - Retas perpendiculares;
- Polígonos
- Simetria
- Congruência e semelhança

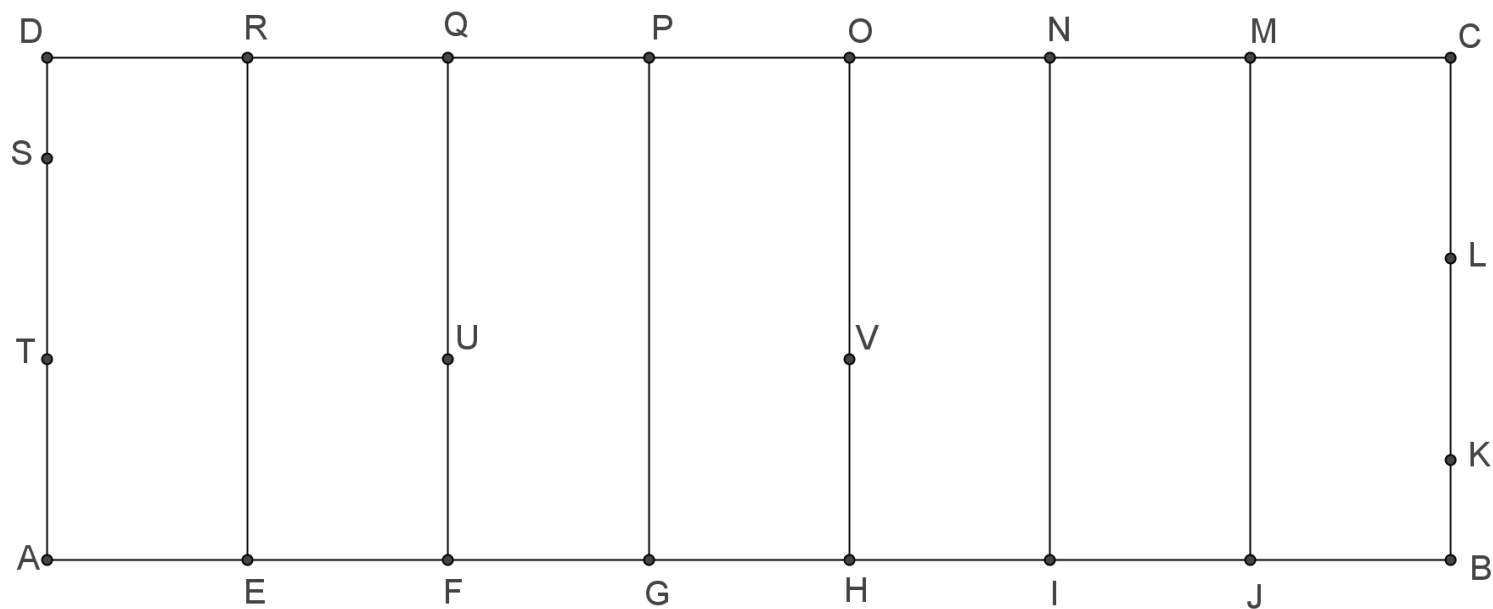
□ Geometria Espacial

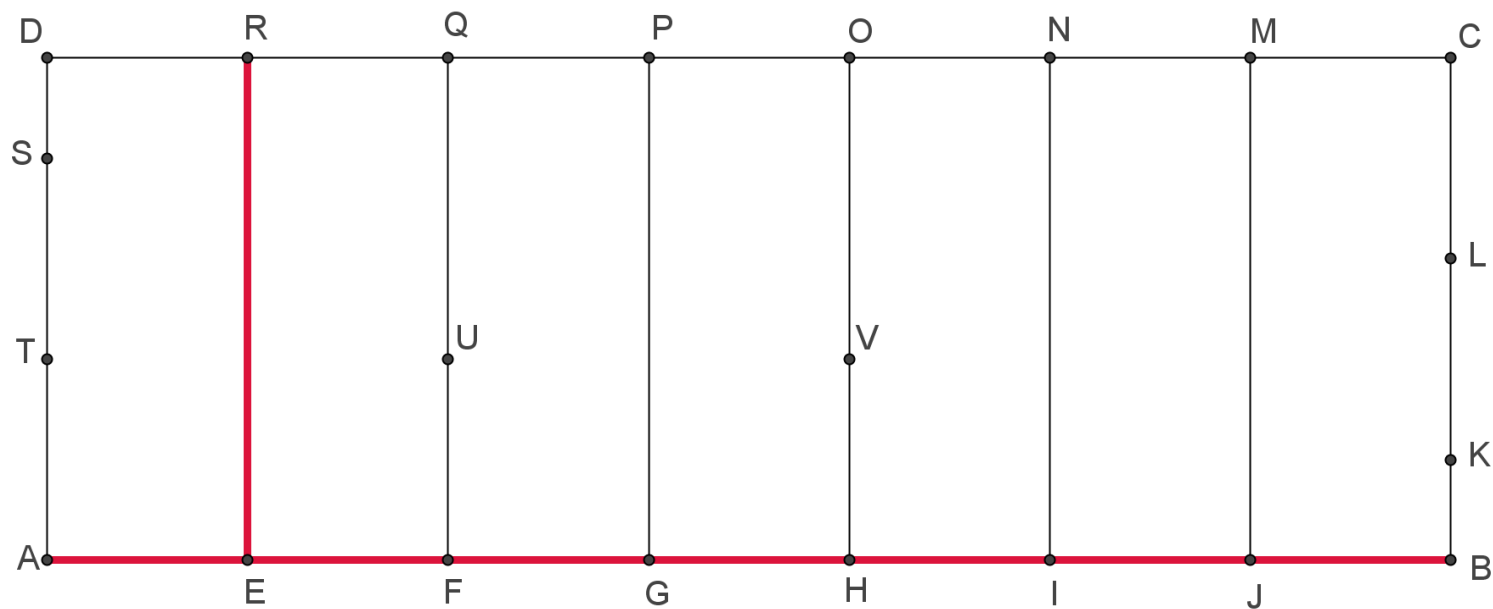
- Poliedros
- Relação de Euler
- Área e Volume

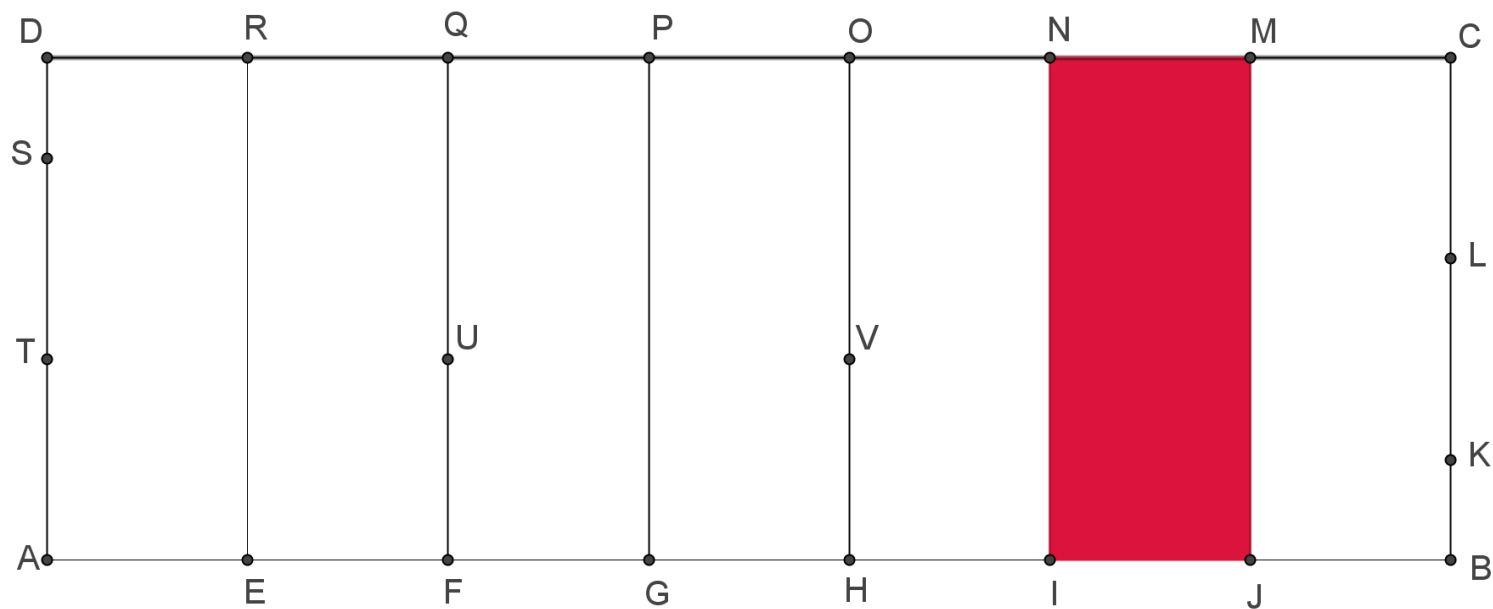
VAMOS CONSTRUIR?

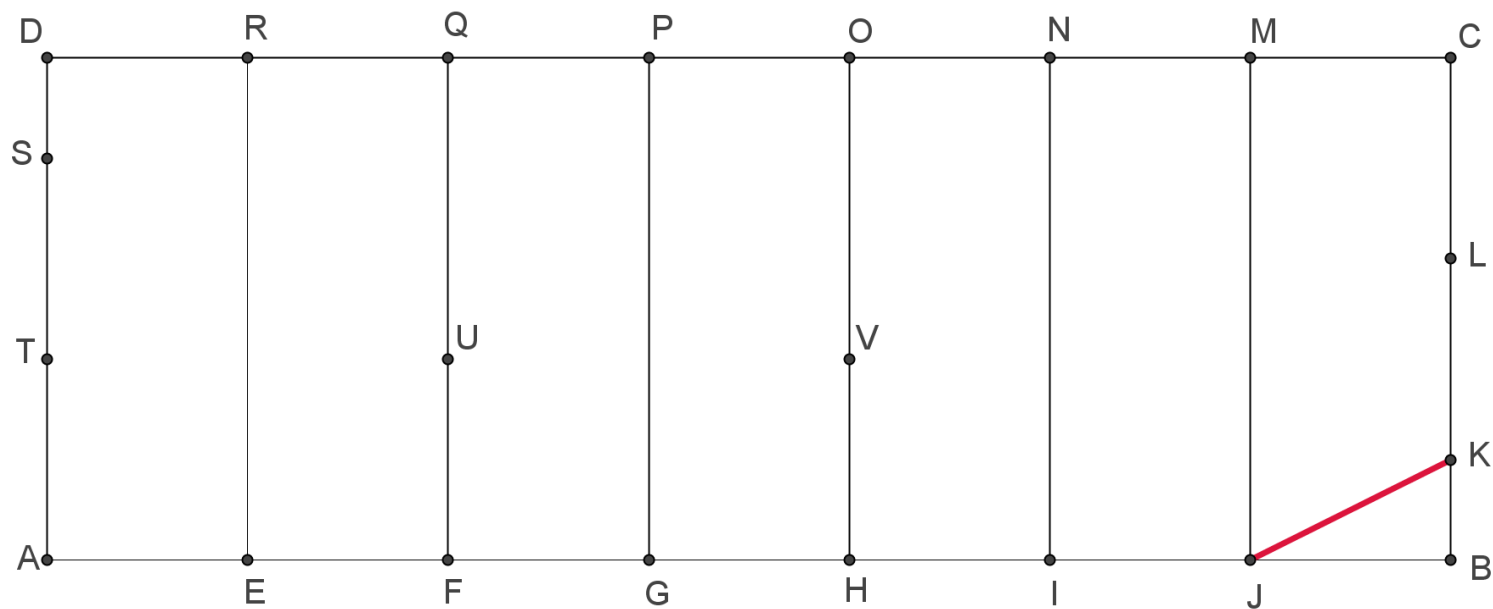


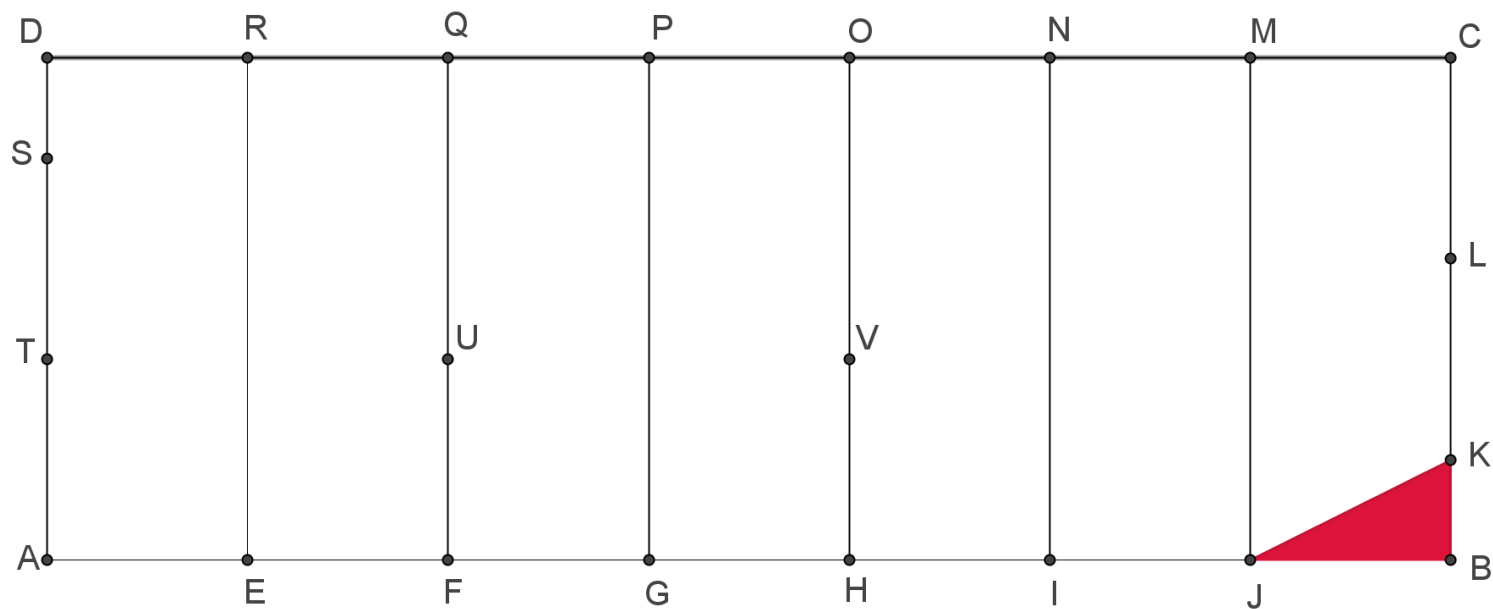


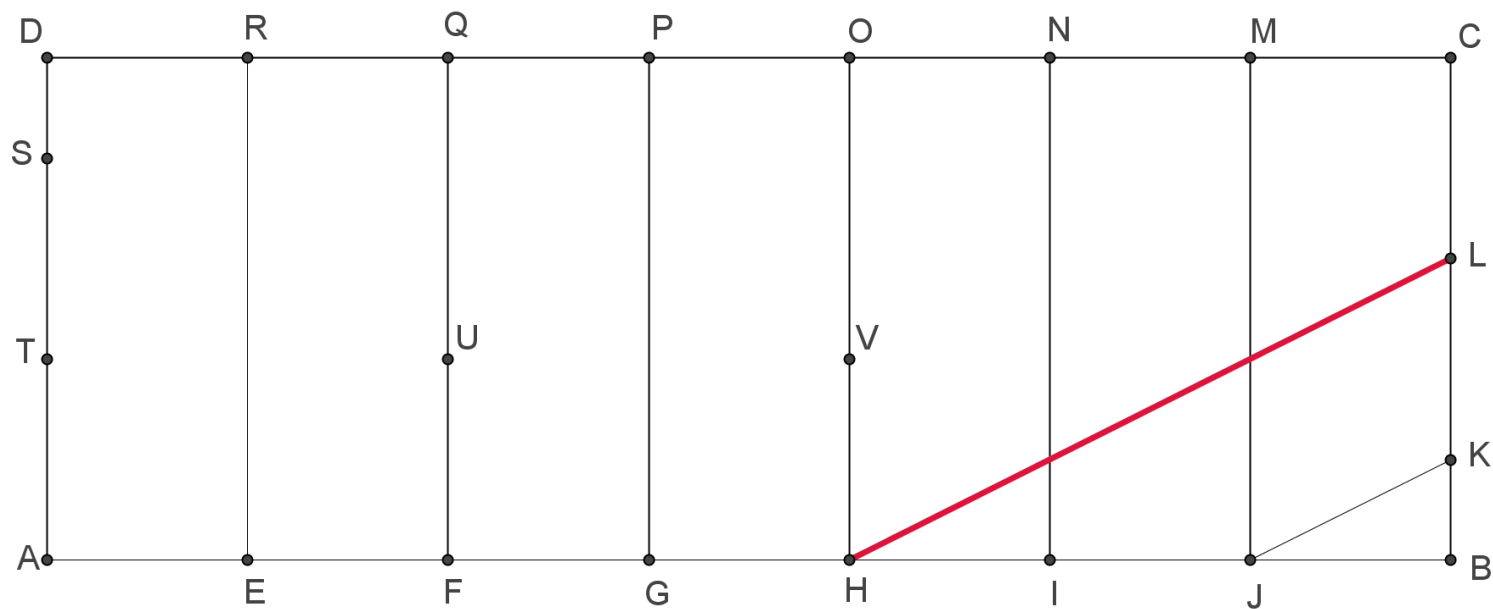


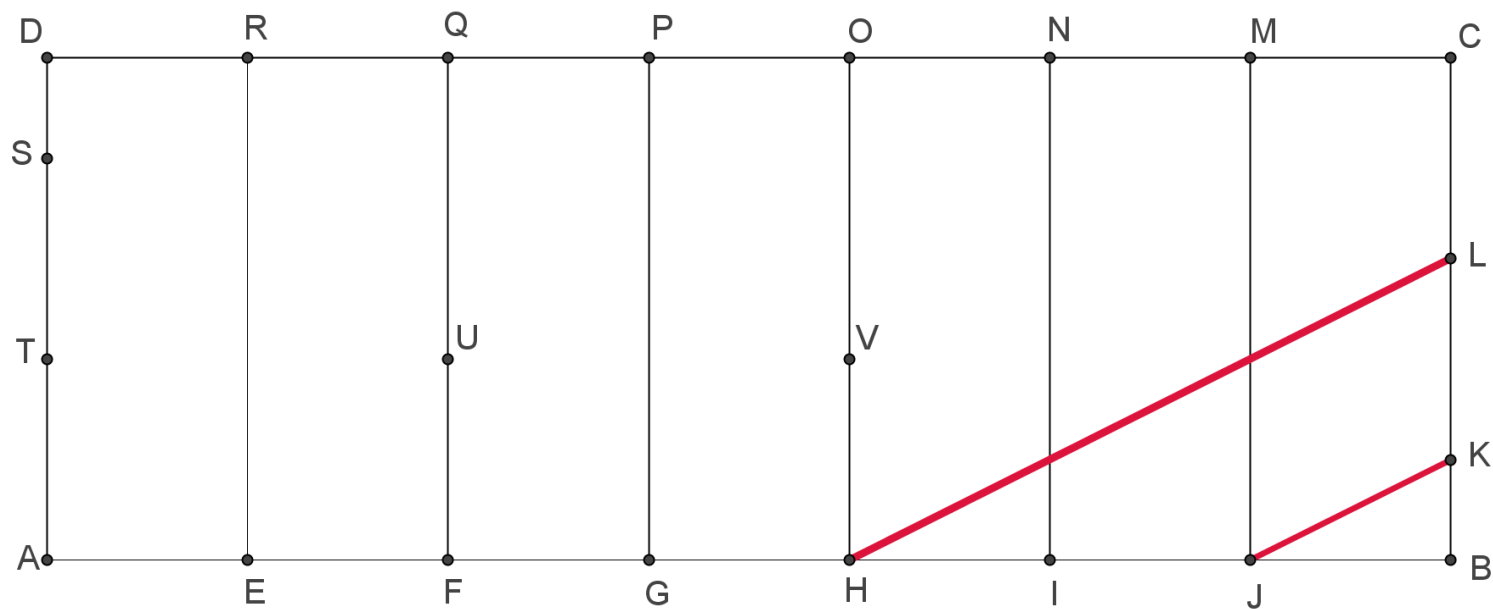


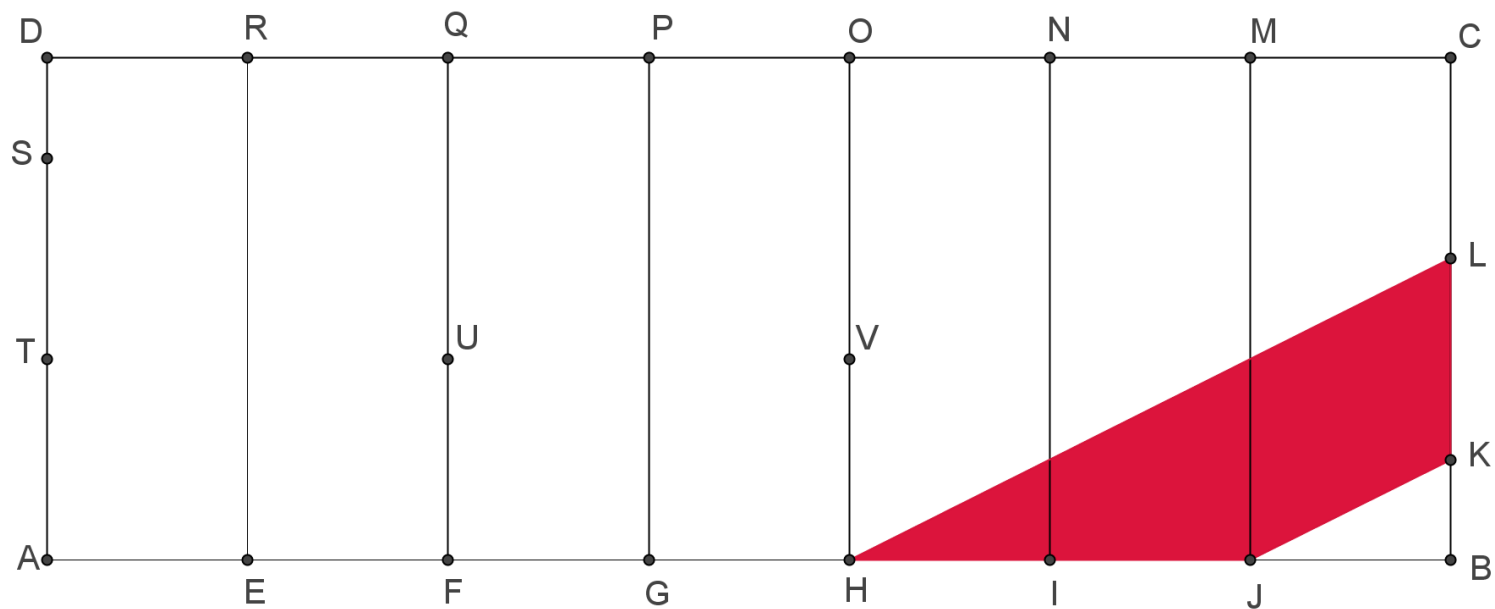


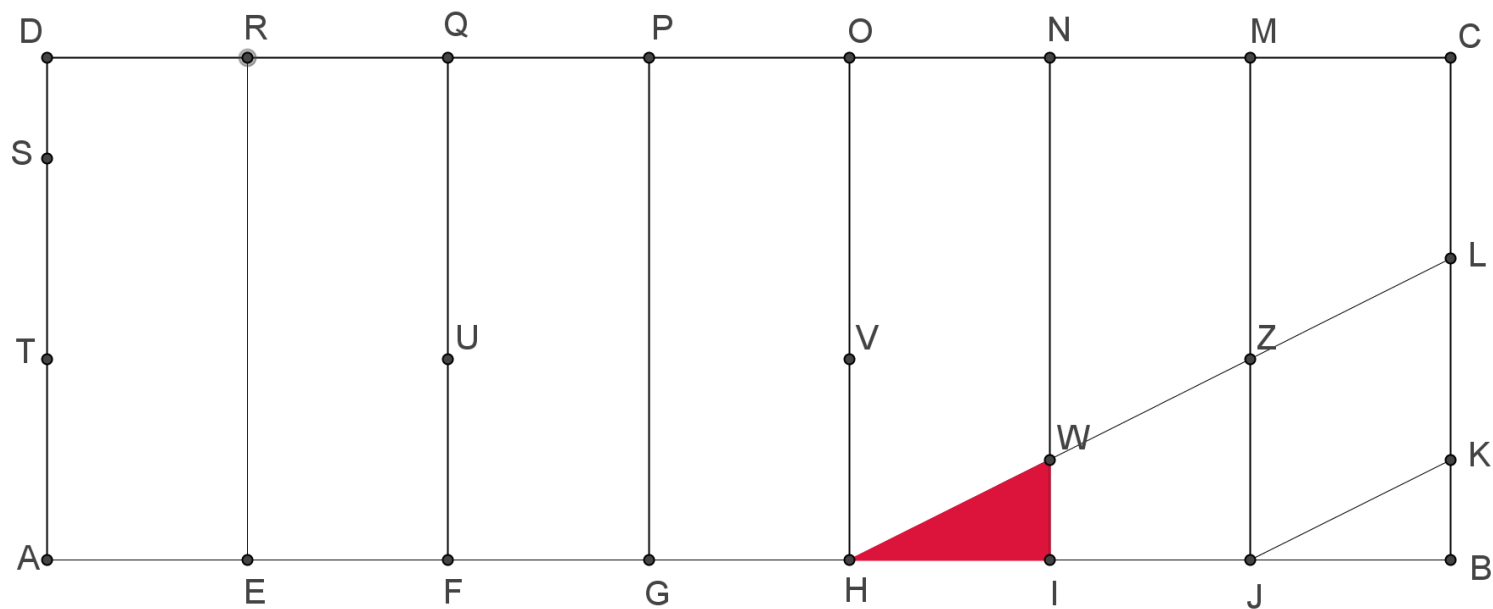


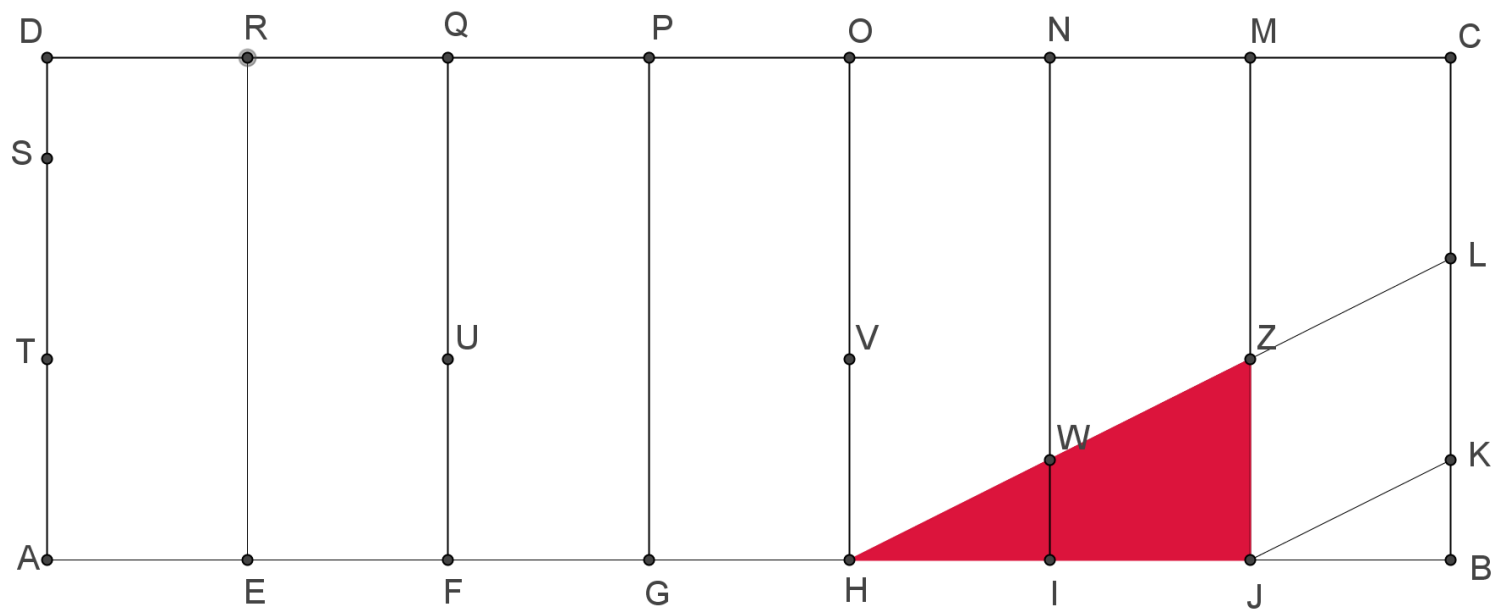




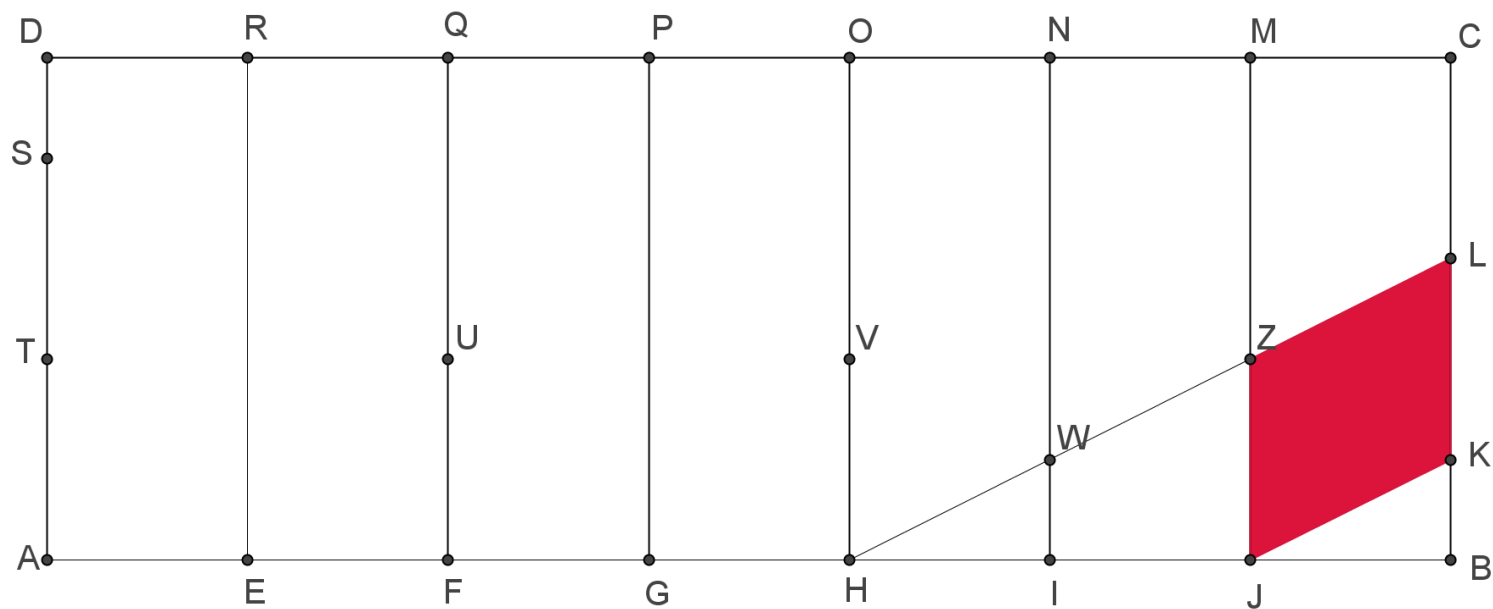


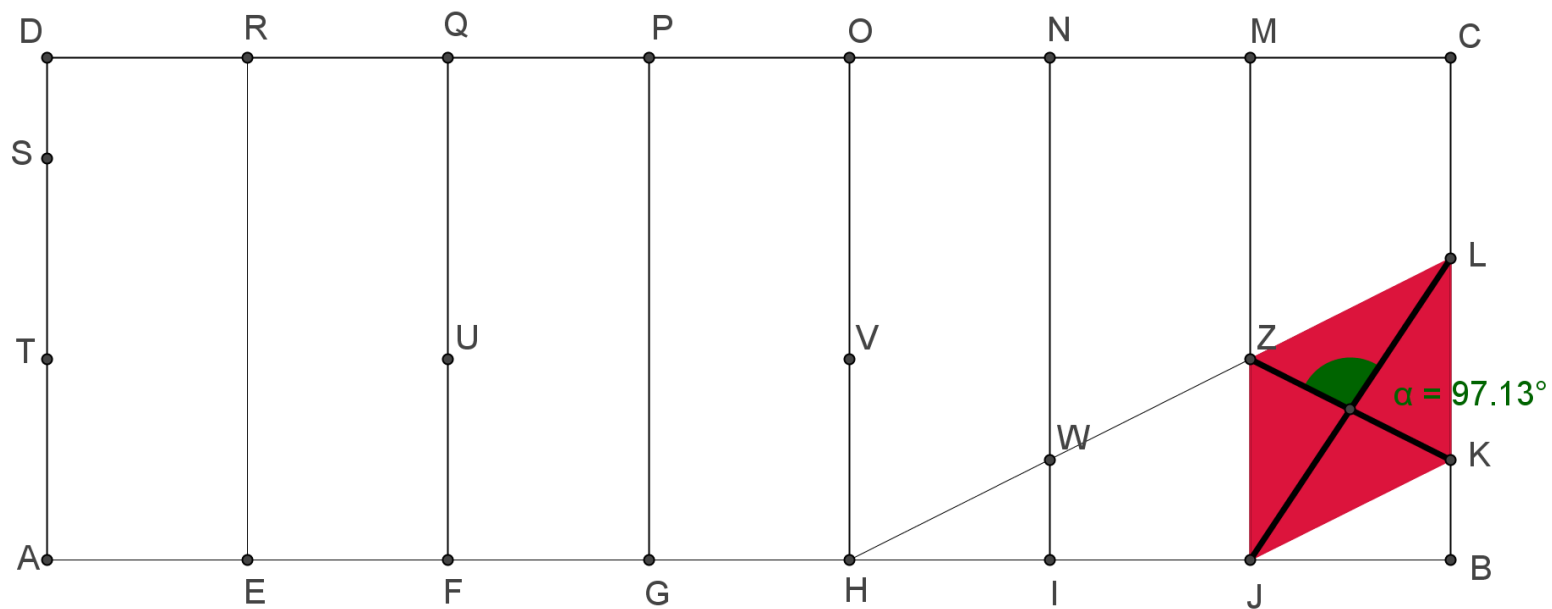


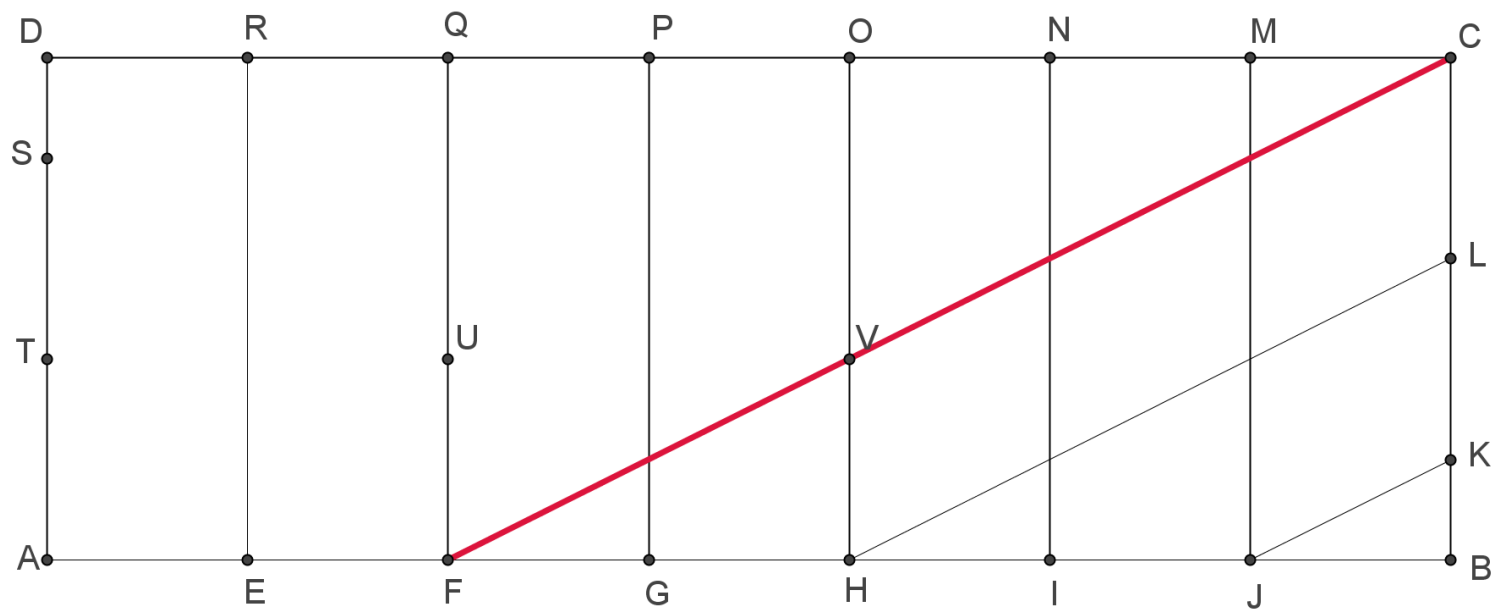


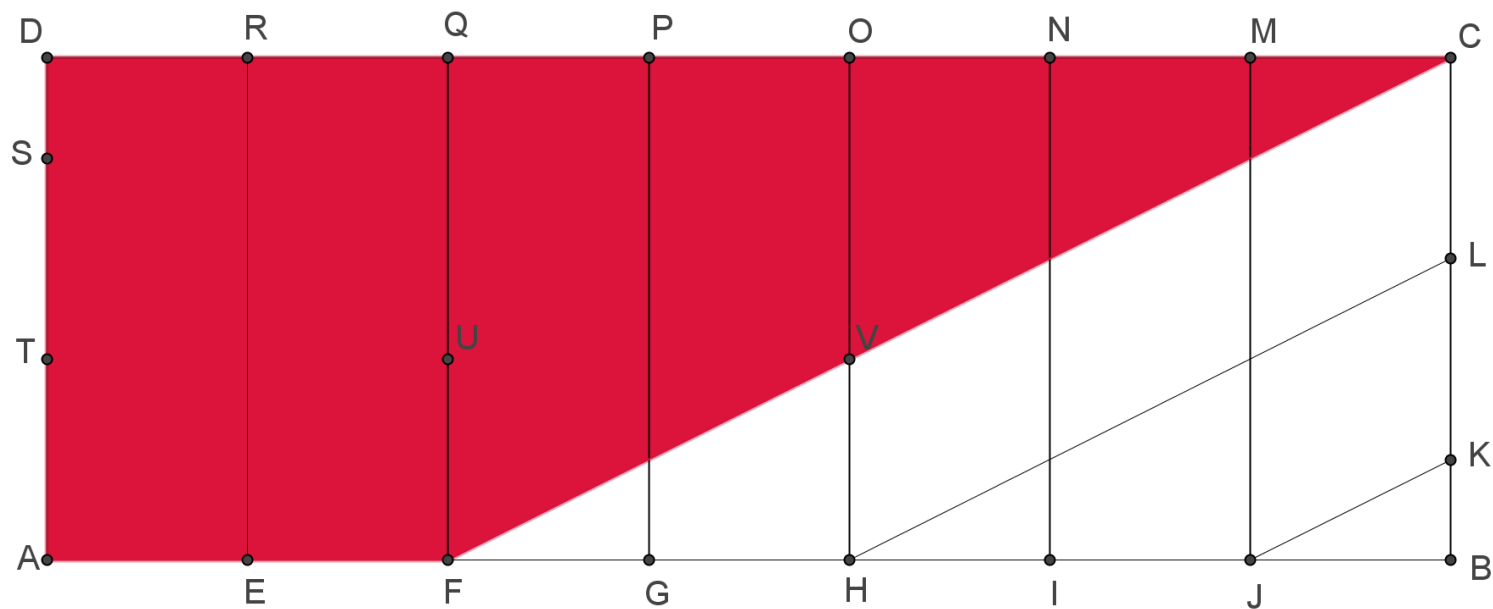


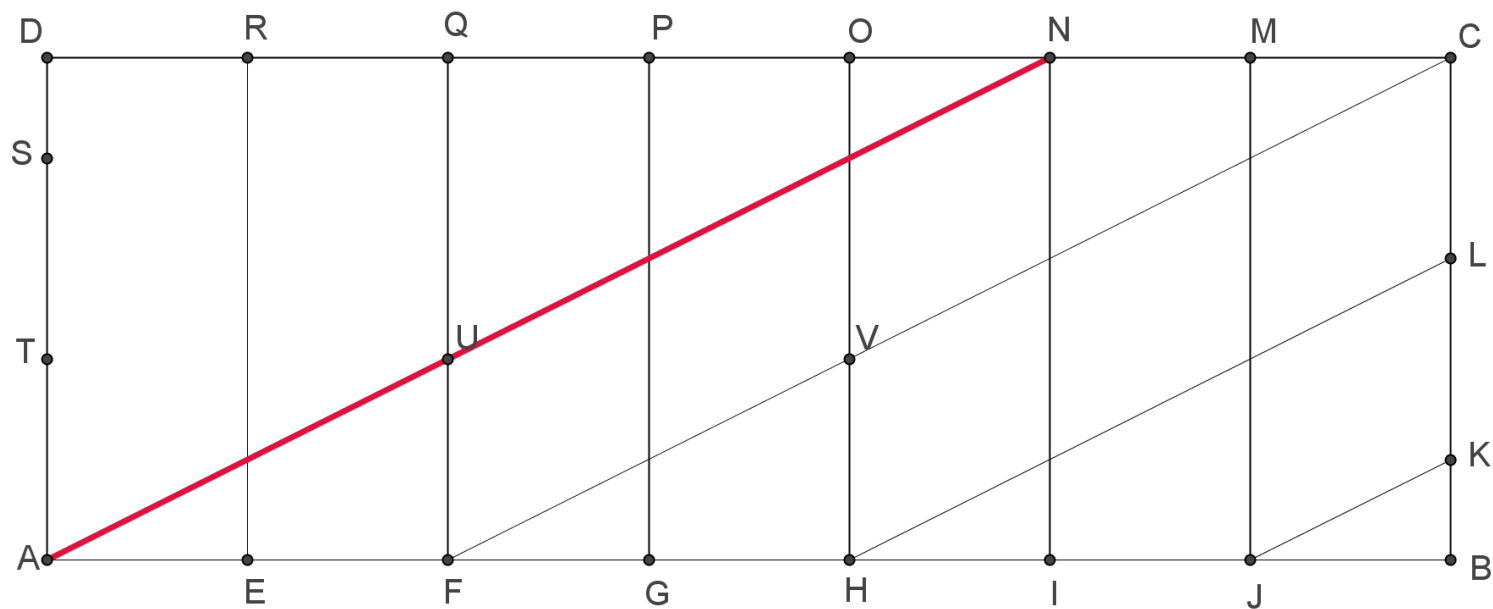


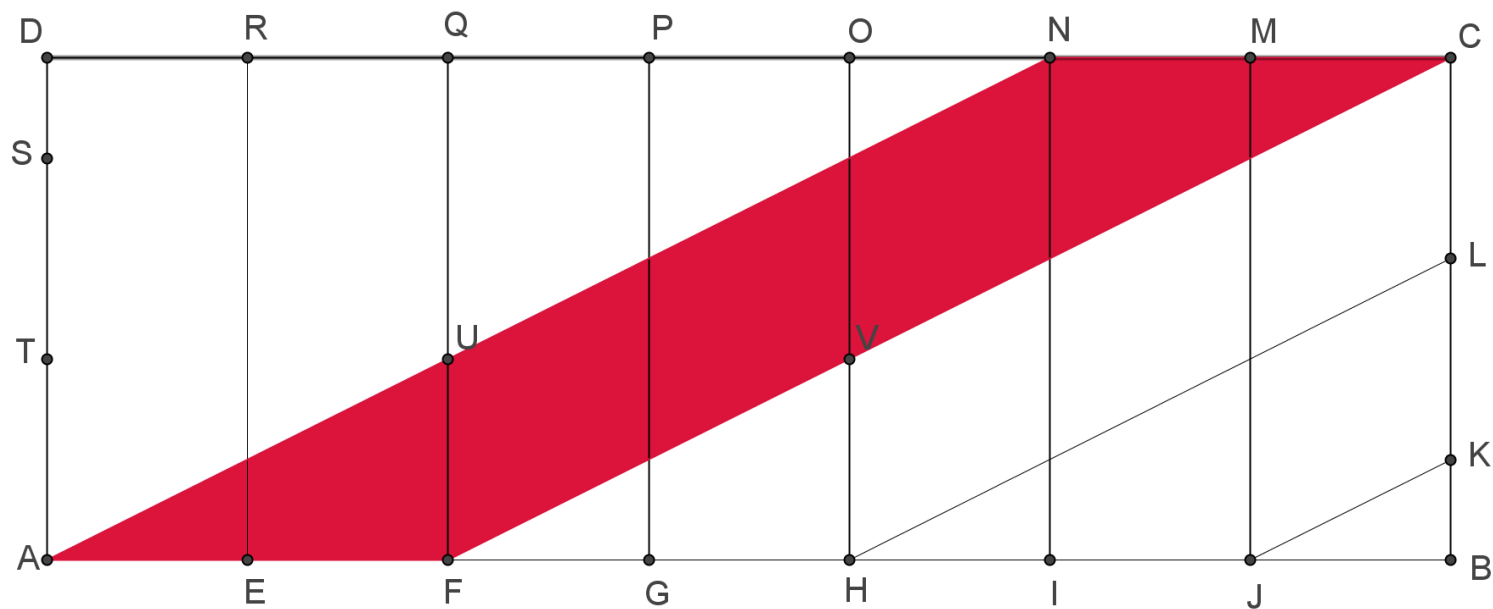


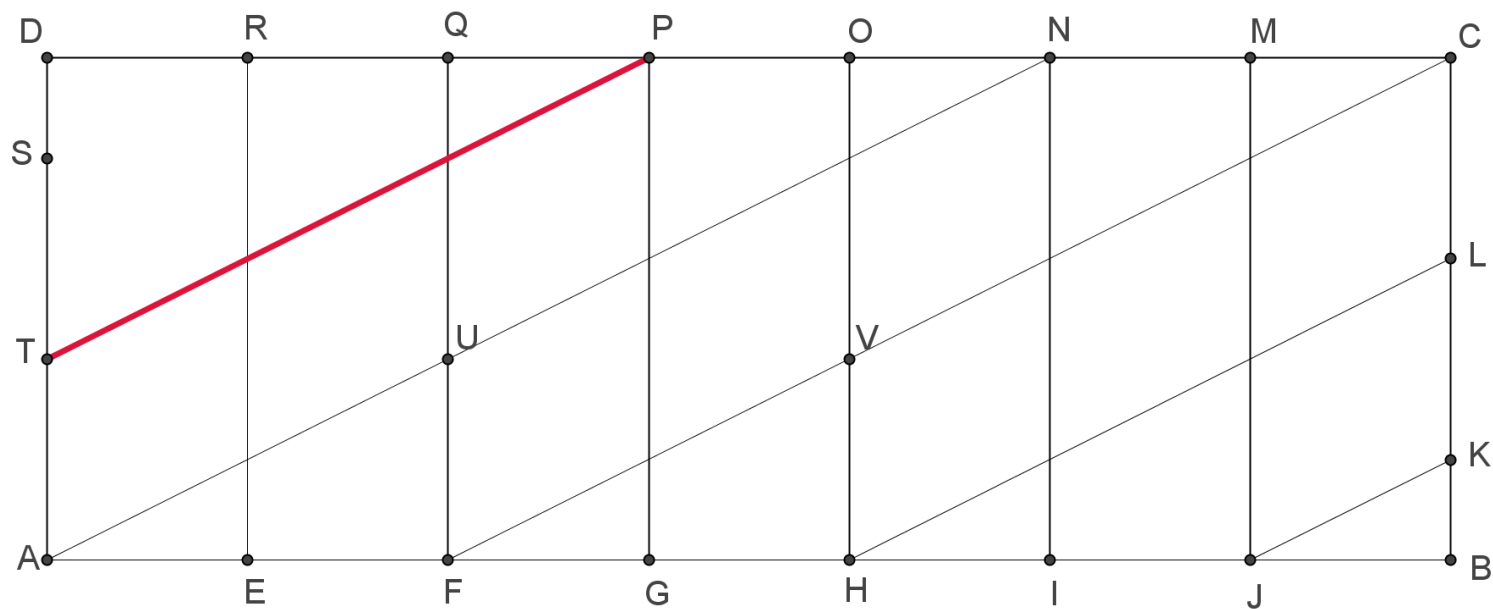


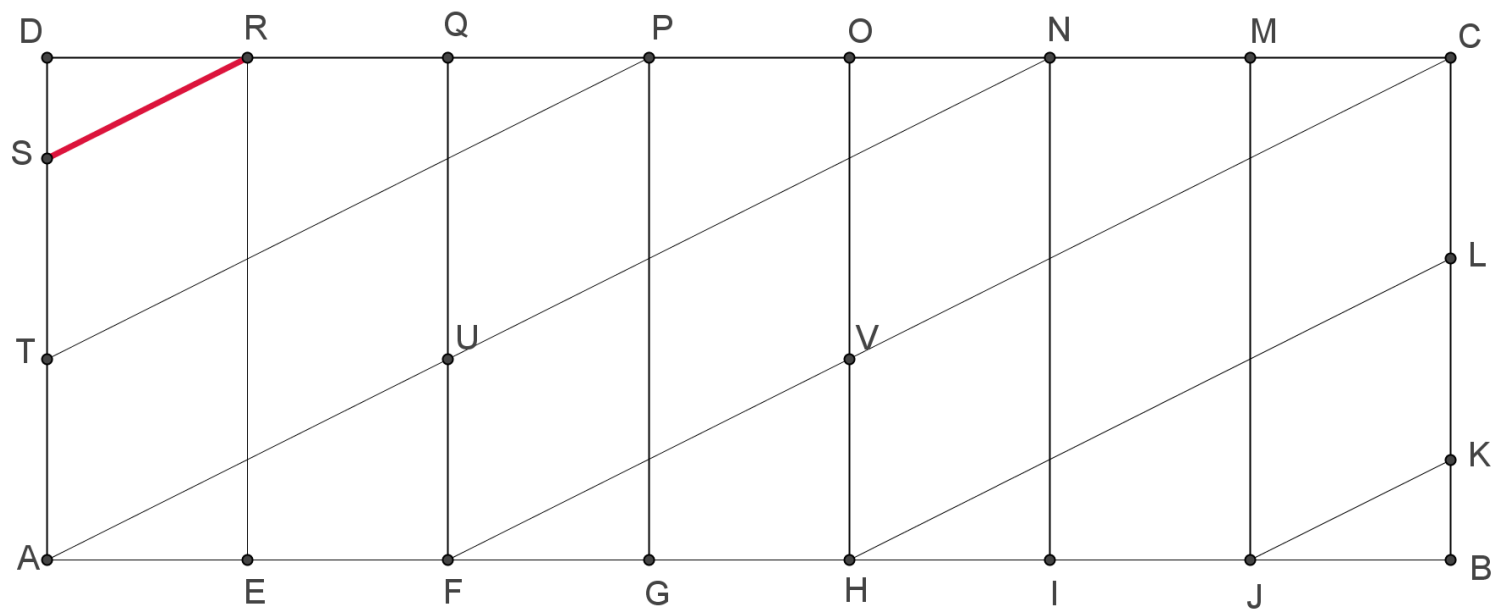


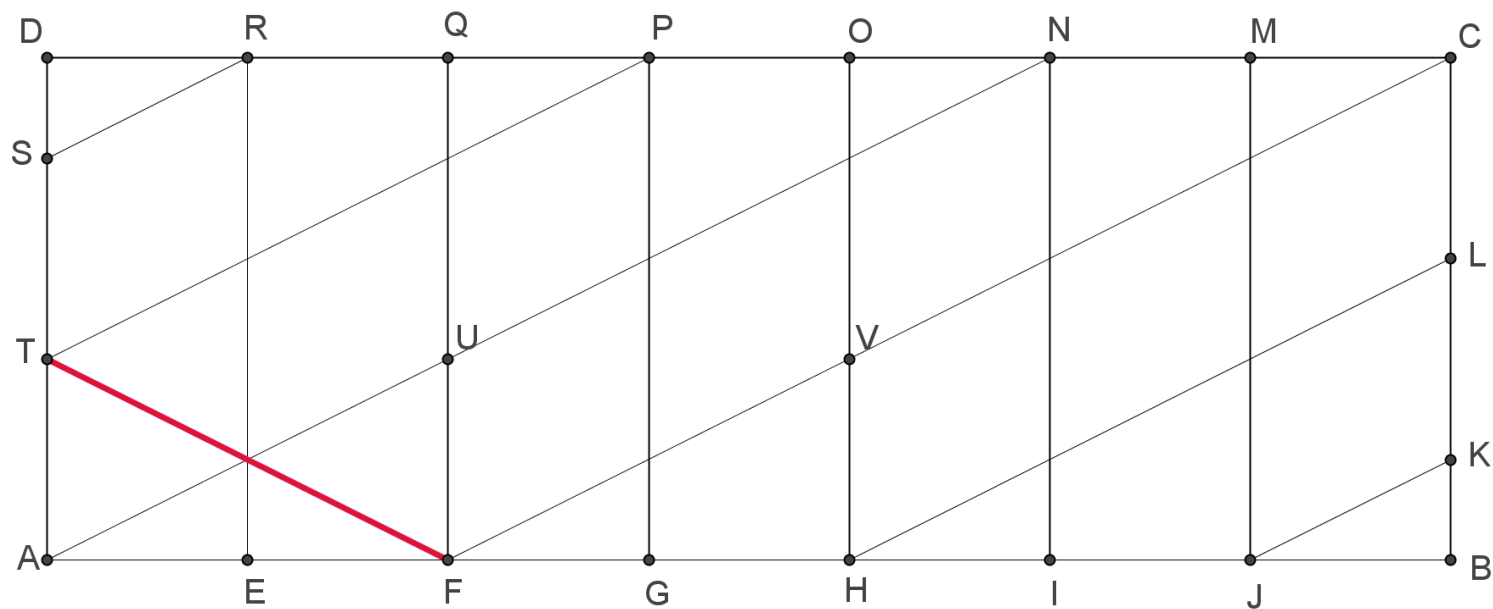




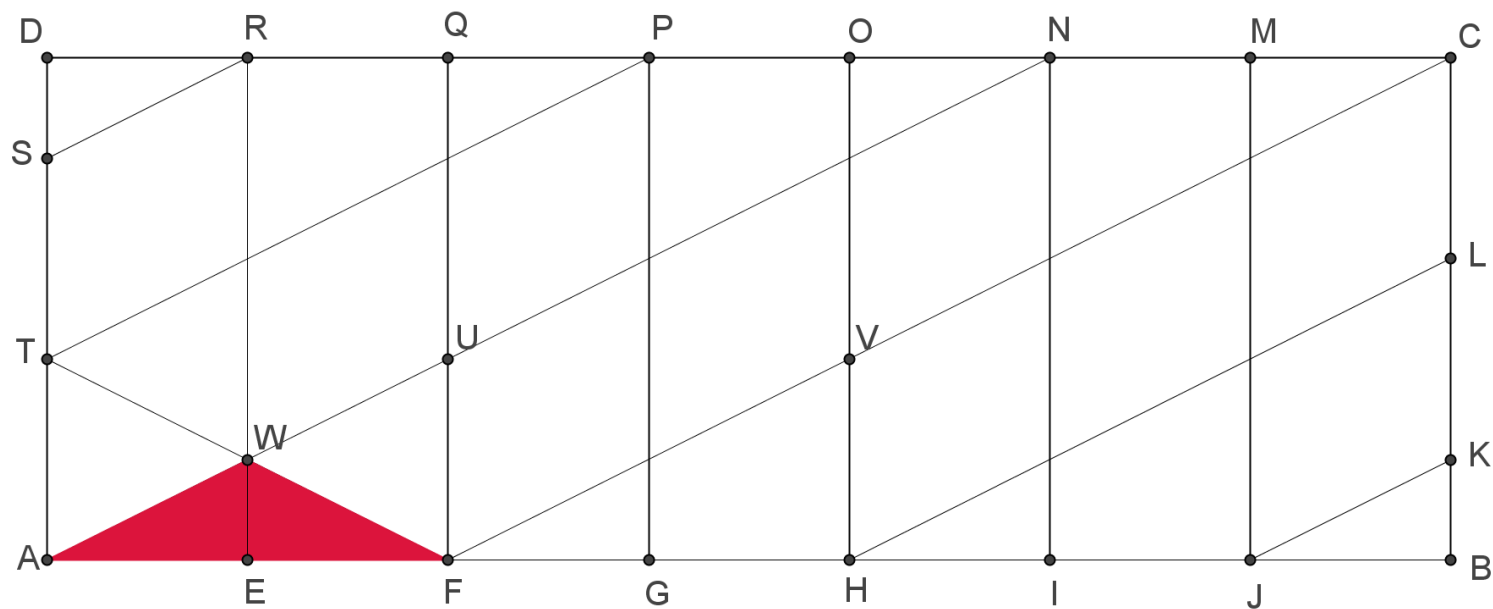


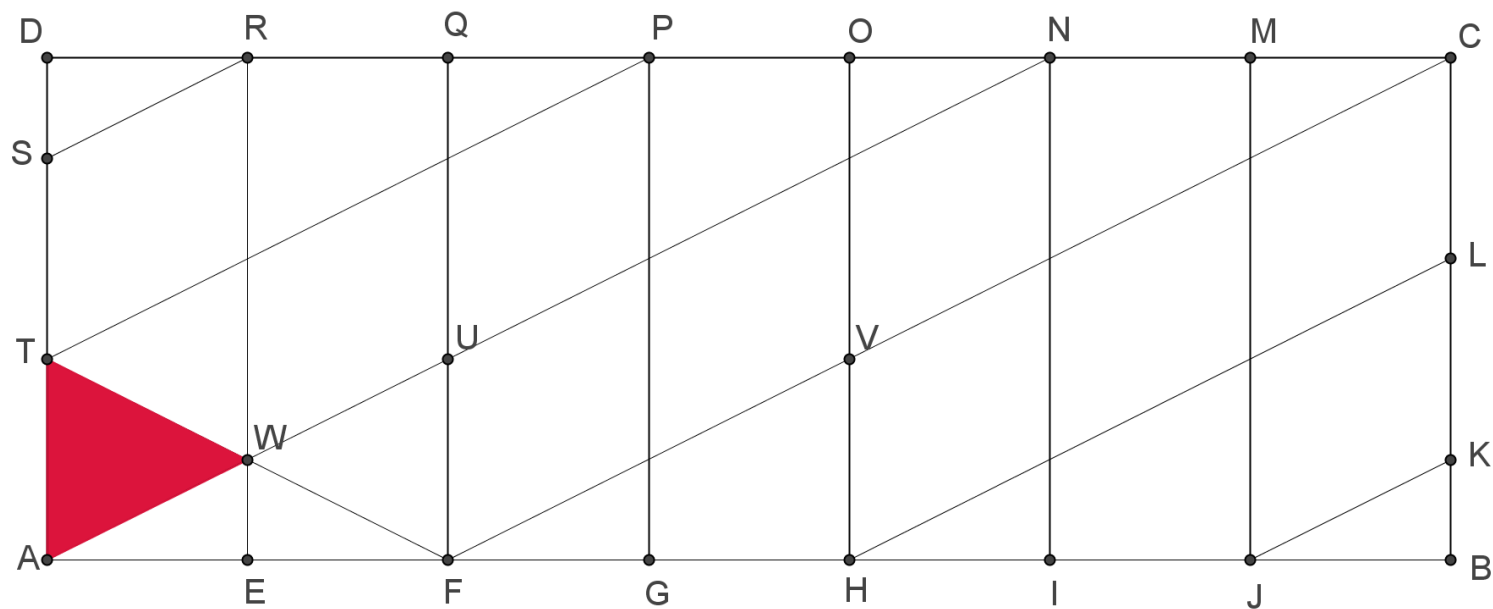


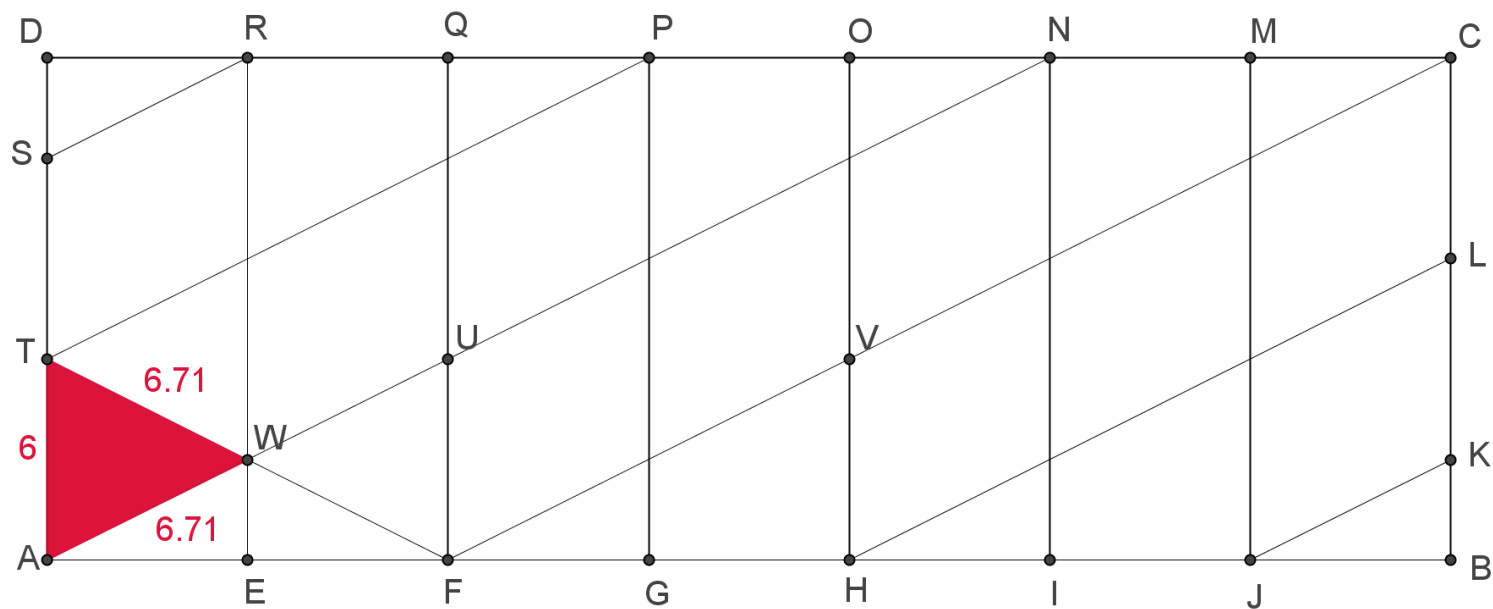


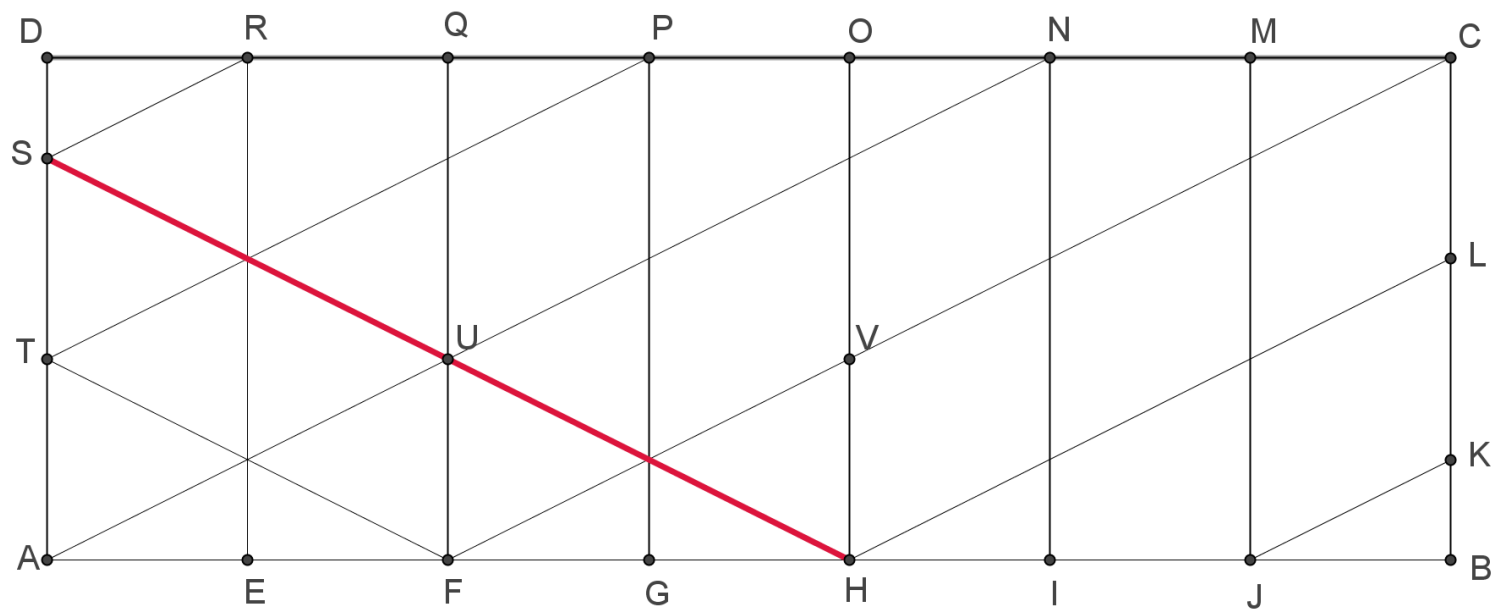


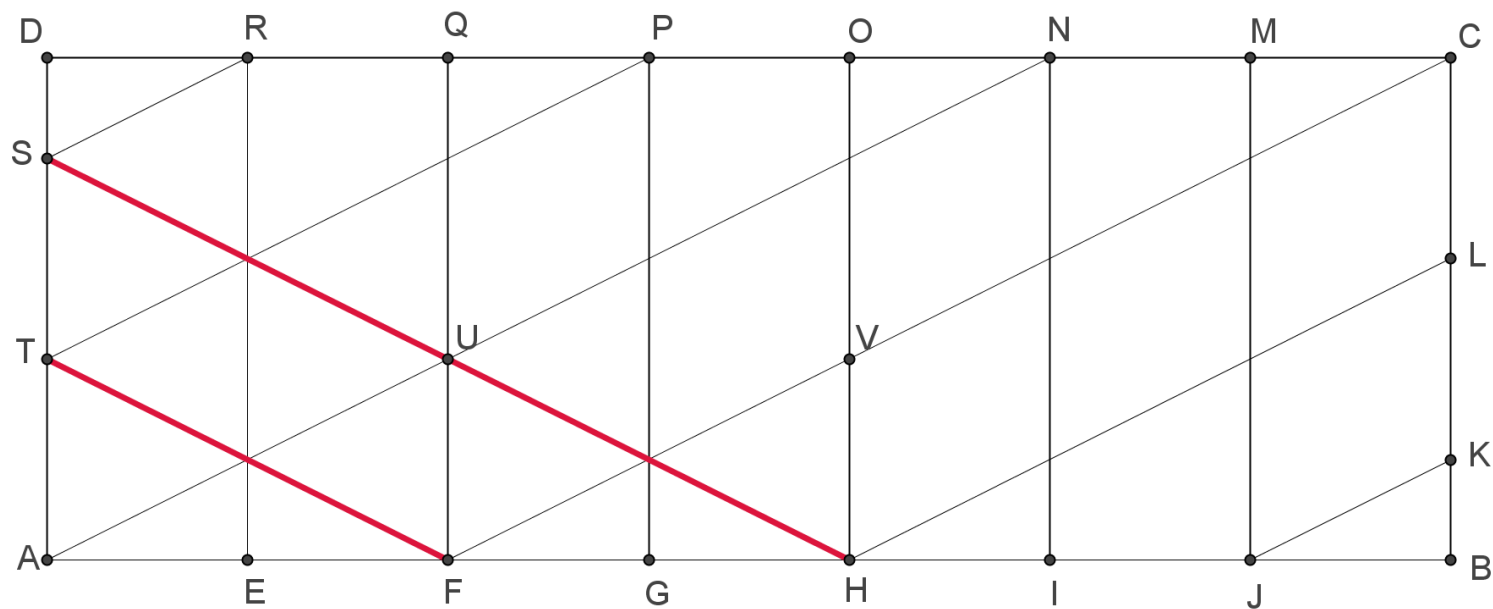


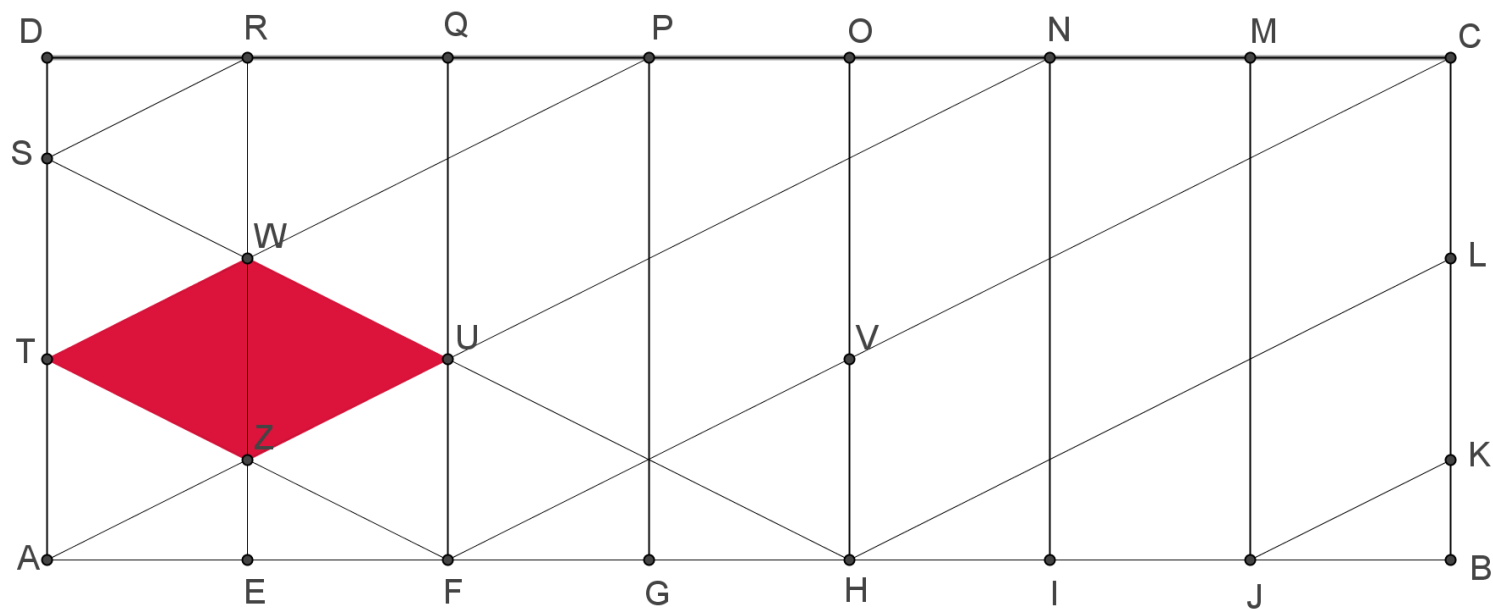


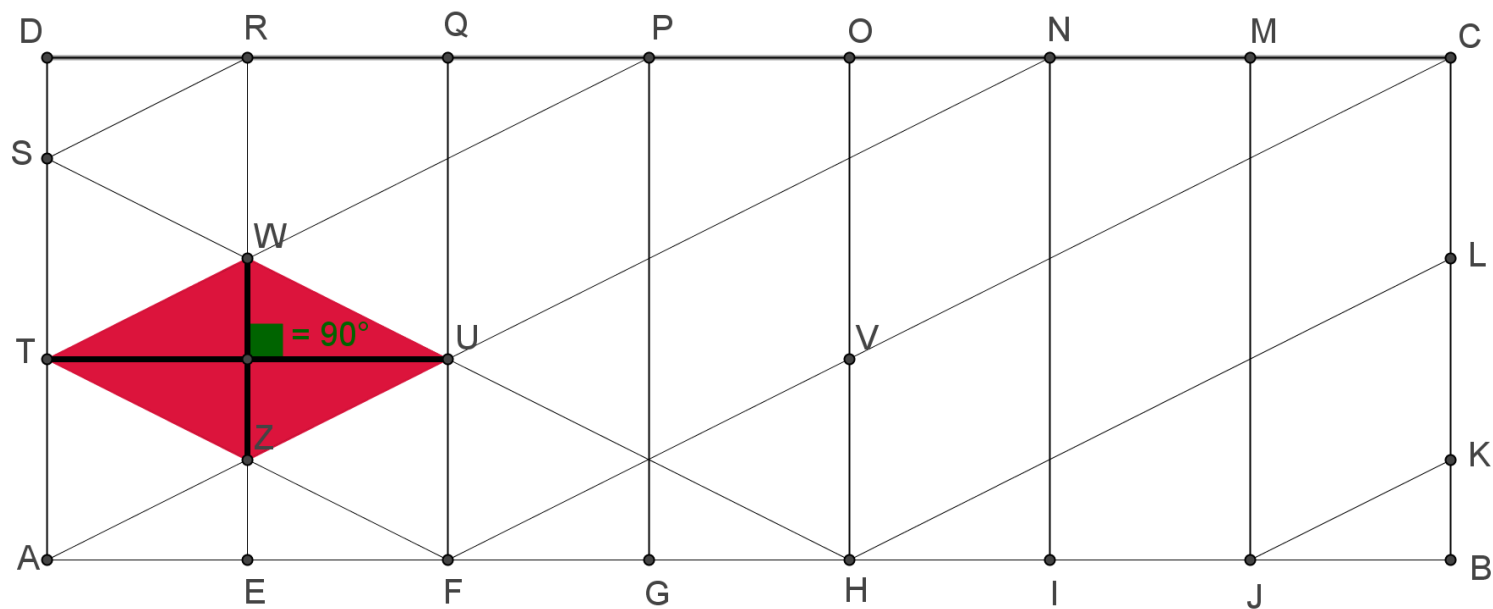


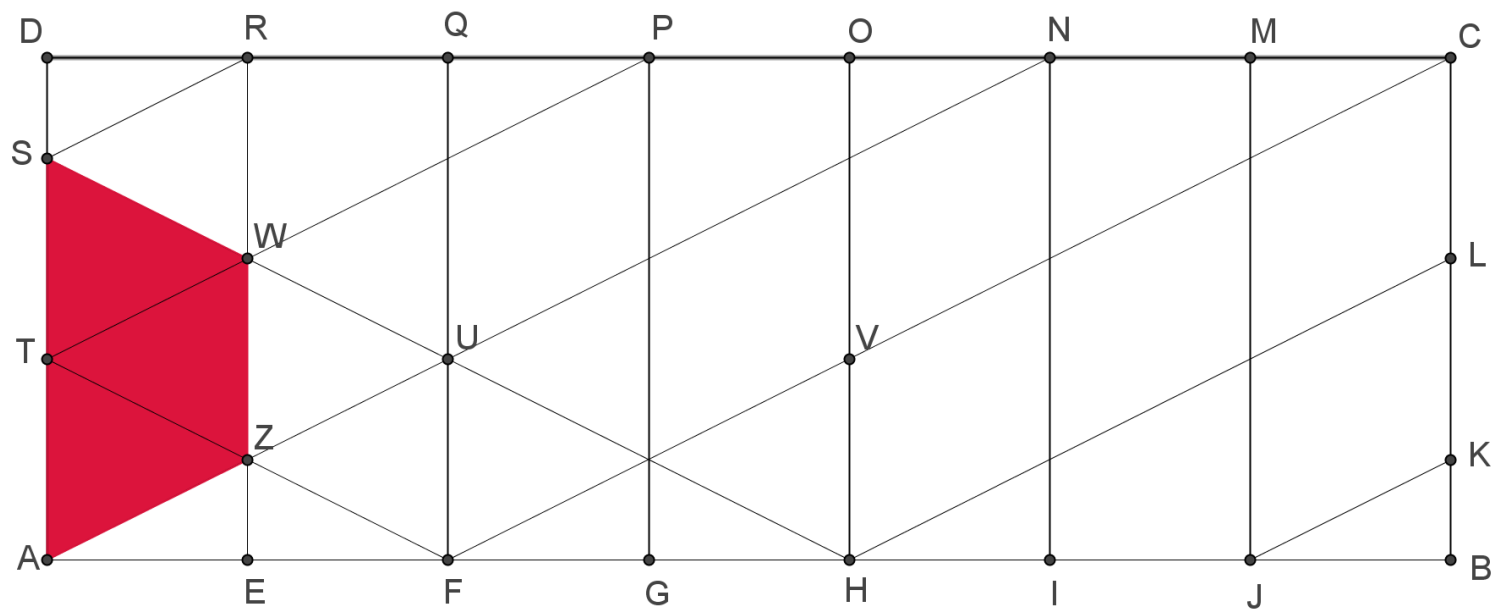


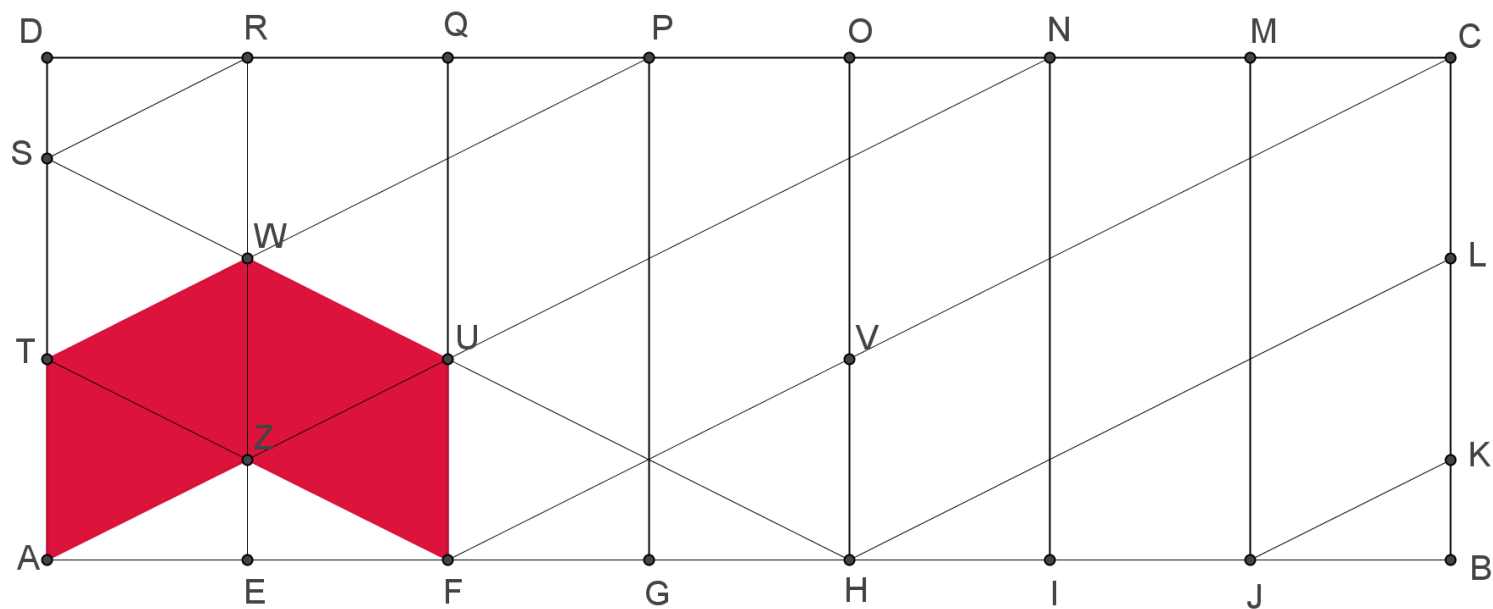


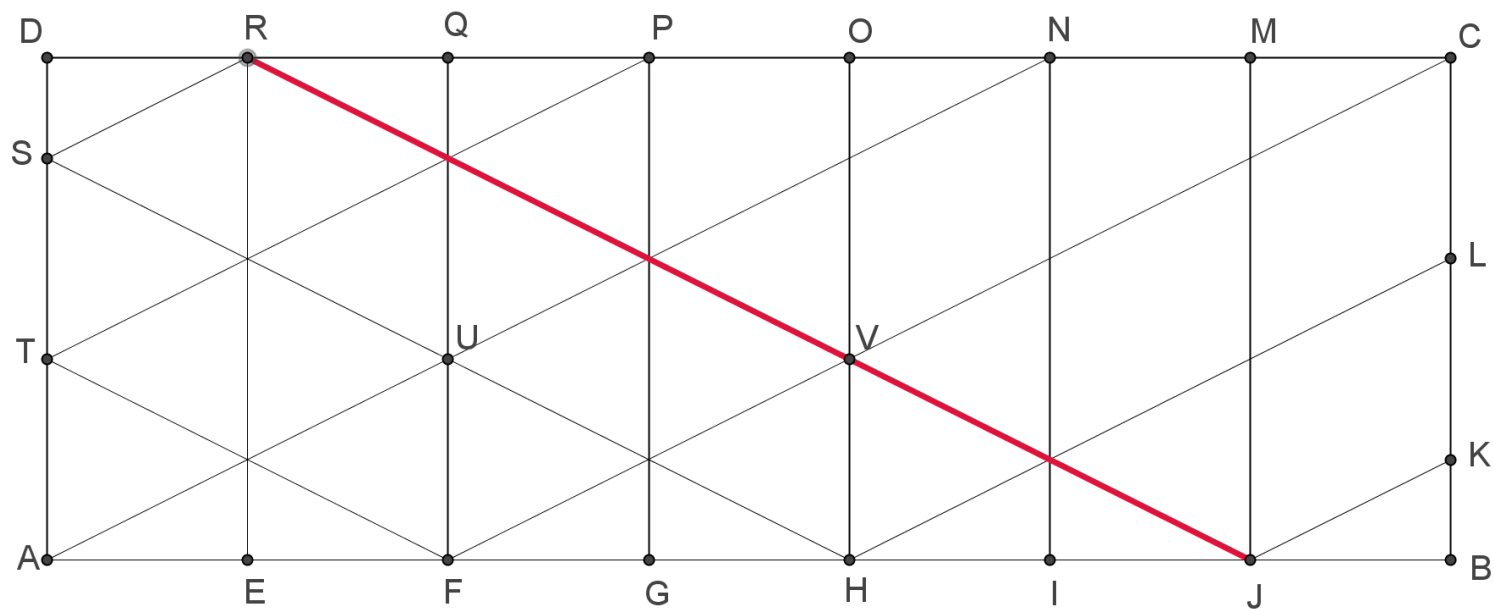


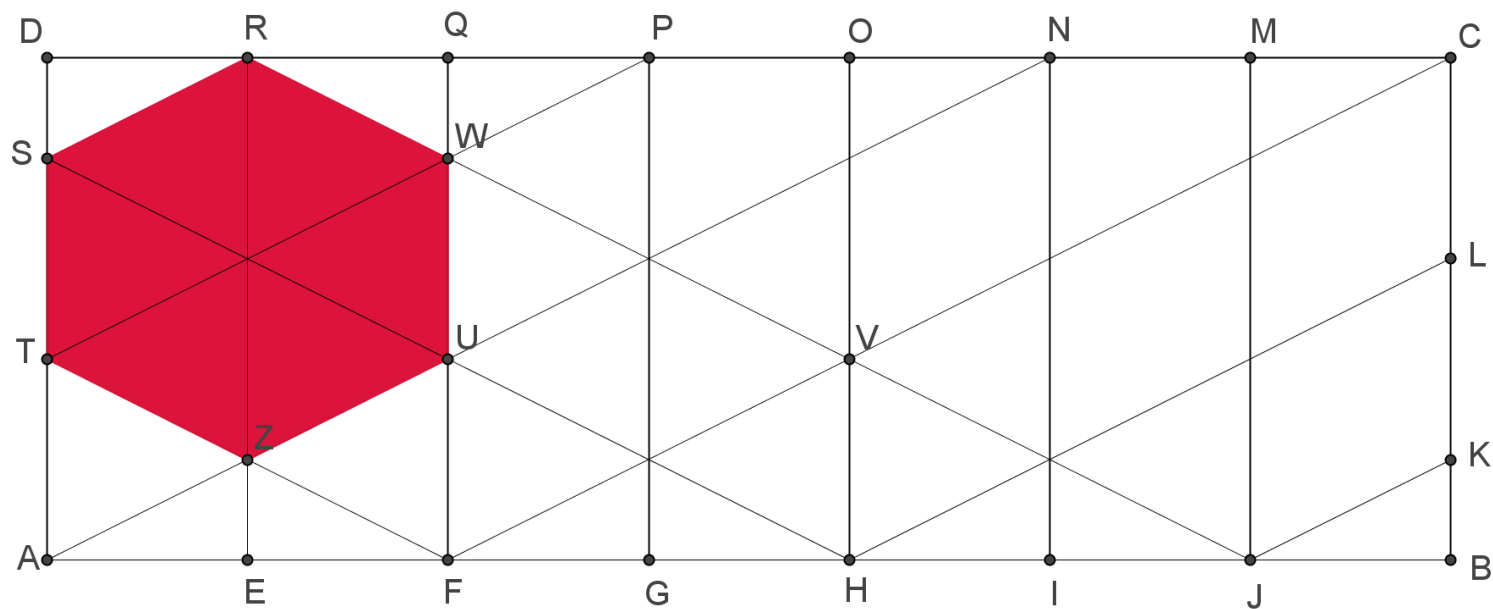


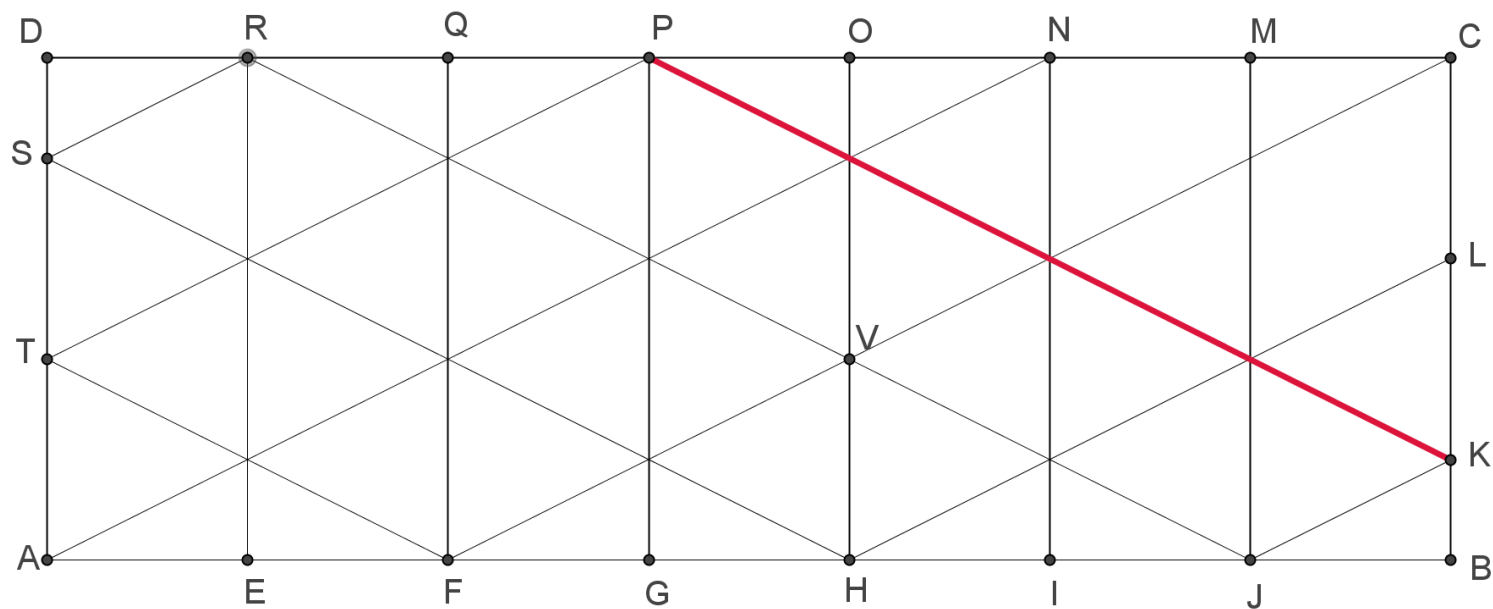


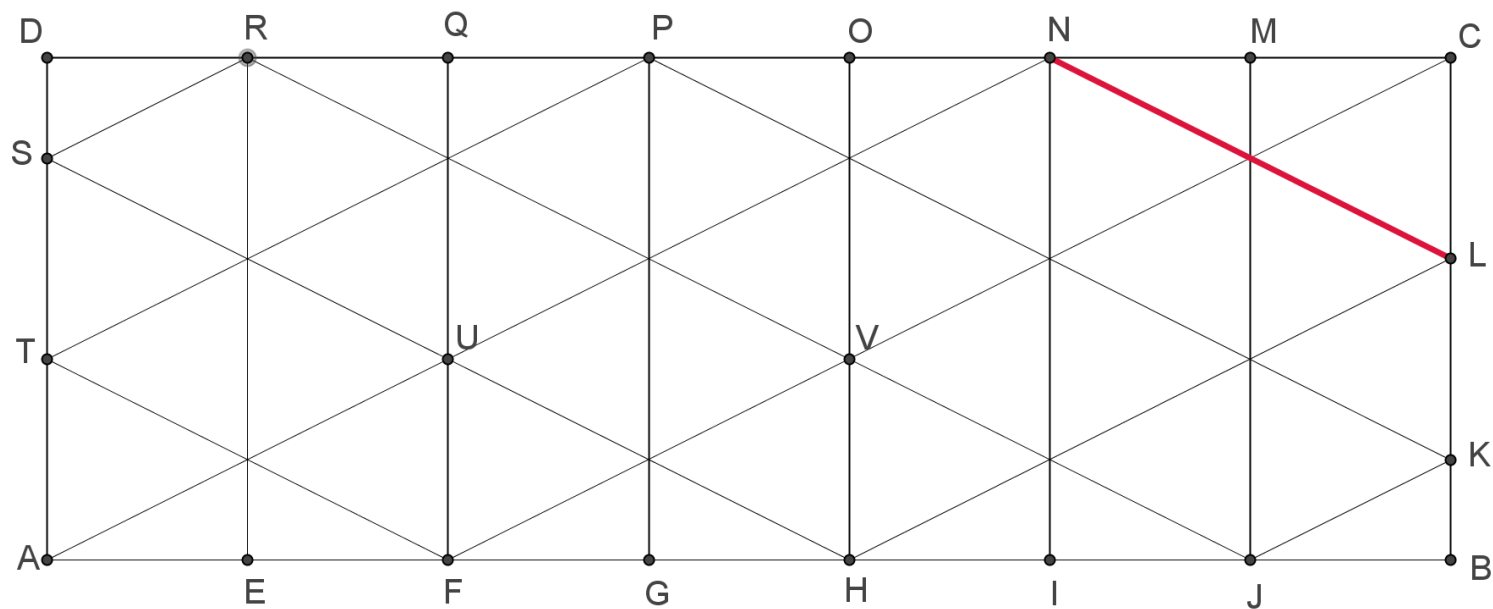


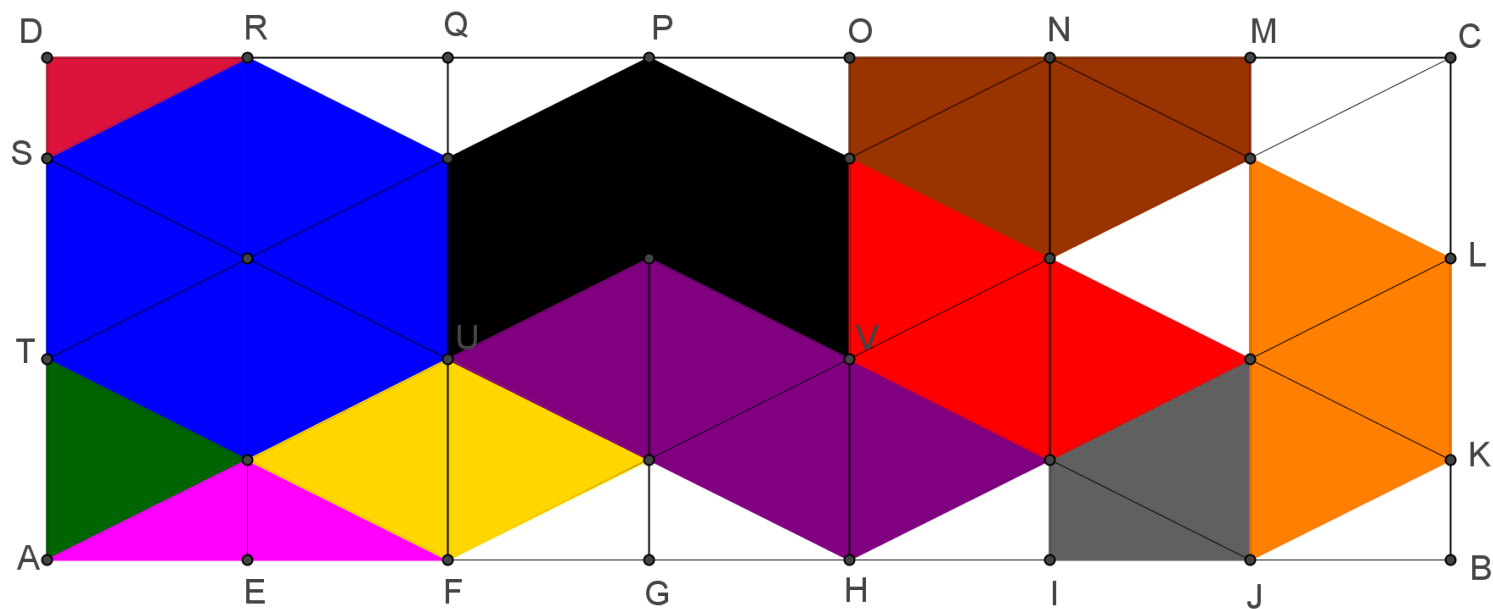


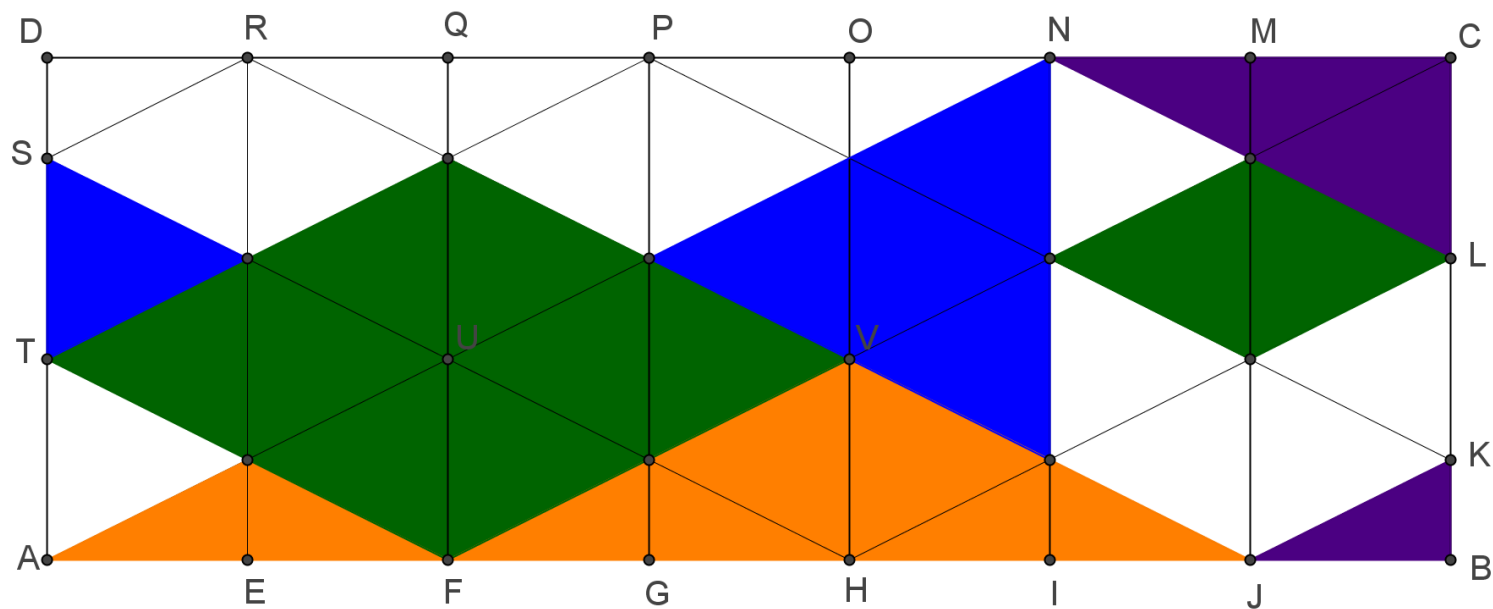


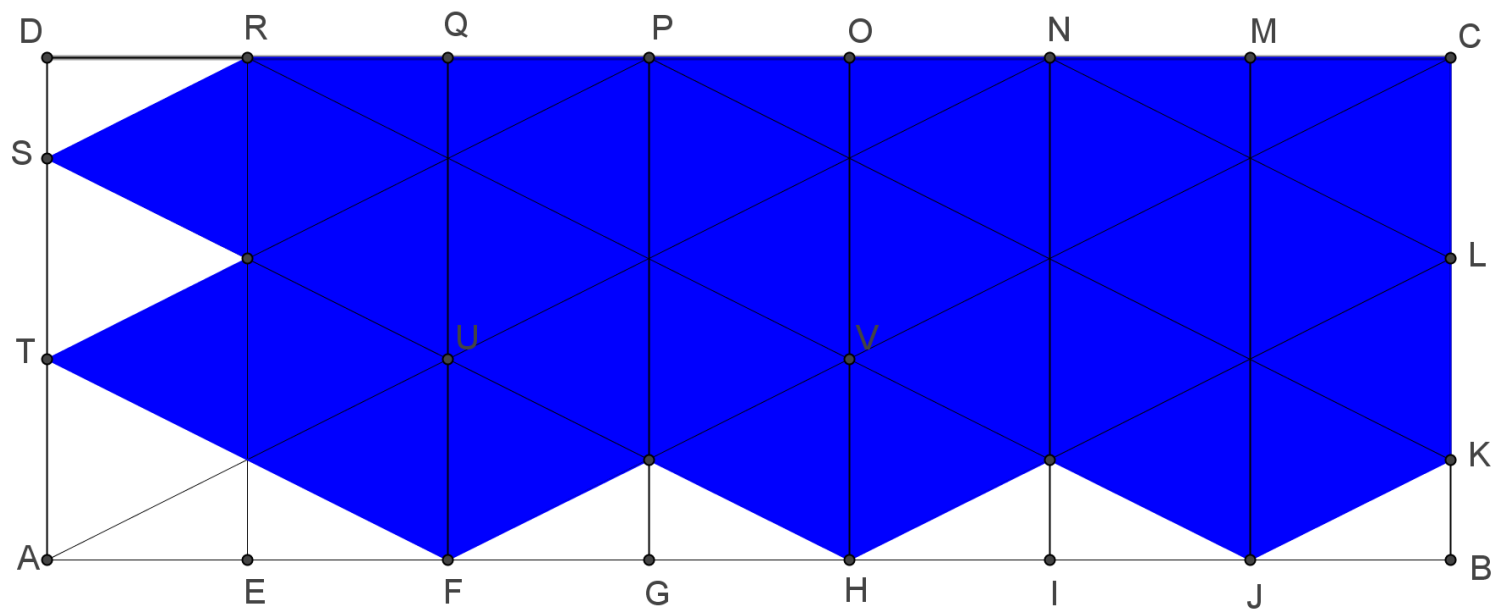












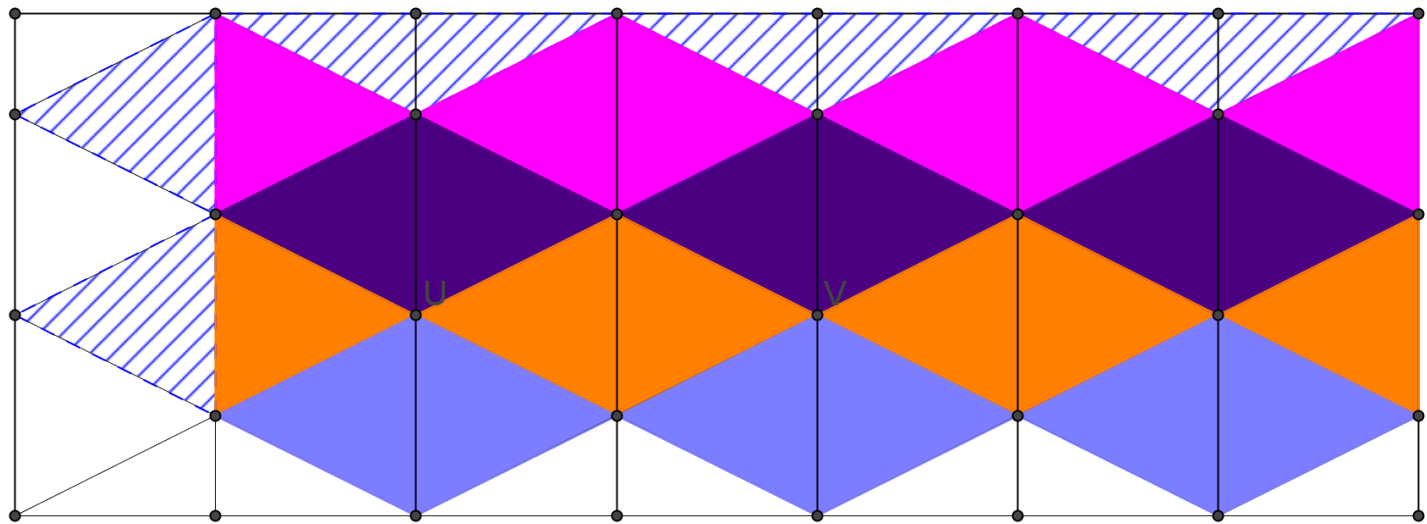
COMO DOBRAR?

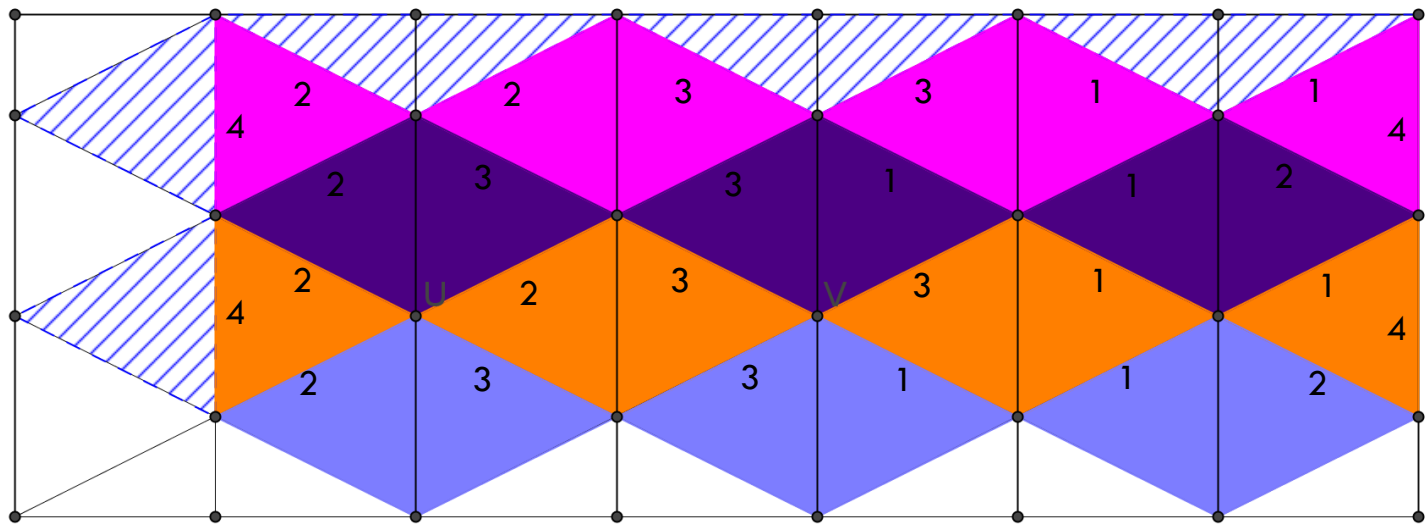
- Linhas Diagonais: dobra em vale
 - Ao dobrar dessa forma, não é possível ver o traçado do molde. Usar um régua para auxiliar

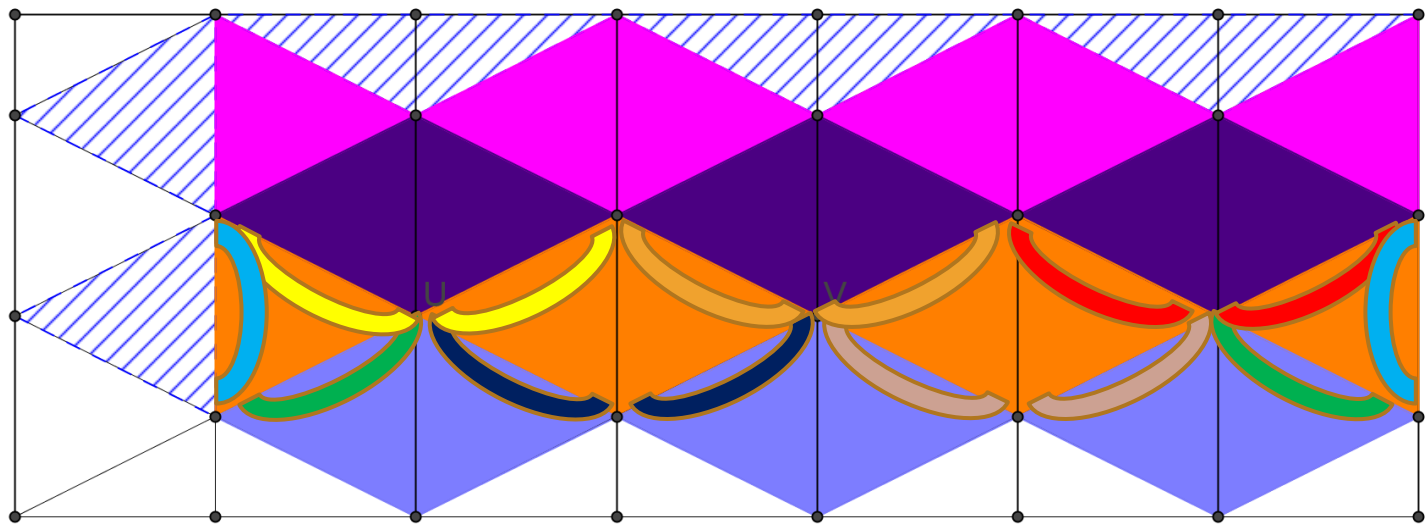
- Linhas verticais : dobra em montanha
 - Ao dobrar dessa forma, visualizamos todo o traçado do molde

- Essa nomenclatura das dobras (vale e montanha) é usada nos origamis.

Hora de decorar!!!







Sugestões de aplicação nos anos iniciais

- Caleidociclo – Ciclo da Água

- ▣ <https://www.youtube.com/watch?v=C-11khHsltU>

- Caleidociclo – As 4 estações

- Caleidociclo – Ciclo da Vida

- ▣ https://www.youtube.com/watch?v=zuq8S56U-_c

- Caleidociclos de fotos

- ▣ <http://www.manualdomundo.com.br/2014/06/como-fazer-caleidociclo/>

Calendário 2015

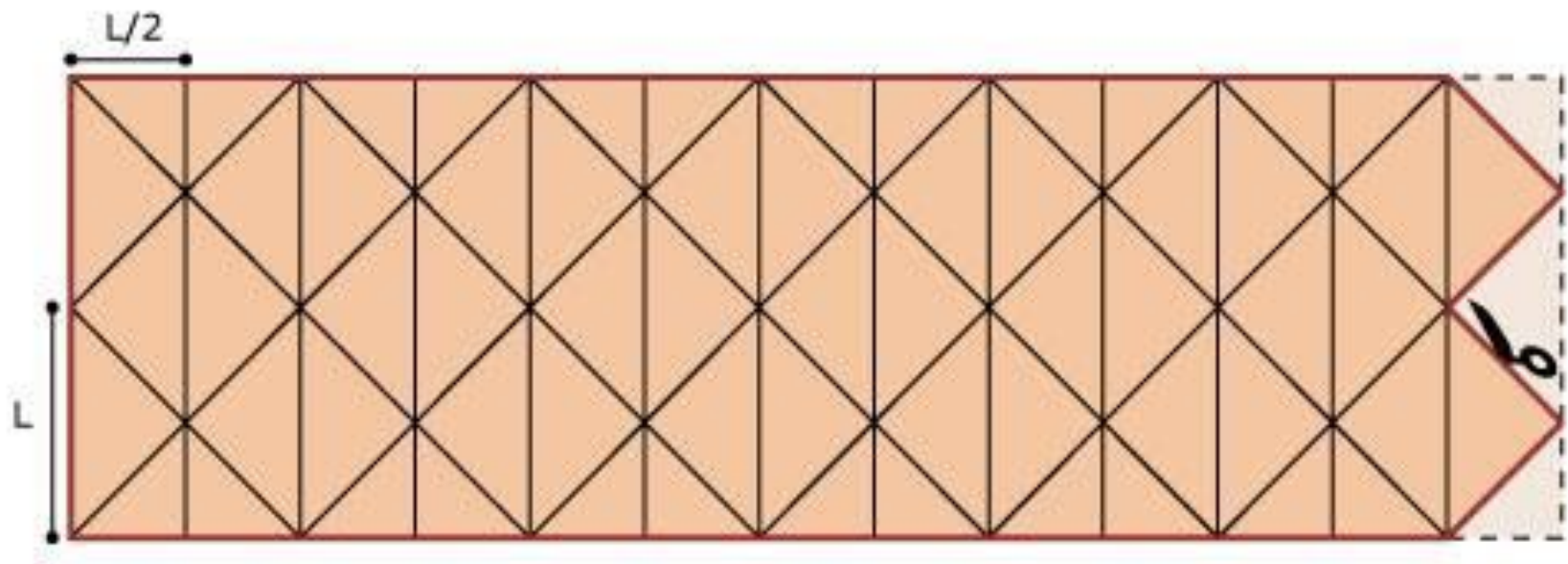
Um caleidociclo hexagonal... em cada ciclo, pode visualizar 3 meses.



Links legais

- <http://www.manualdomundo.com.br/2014/06/como-fazer-caleidociclo/>
- http://webeduc.mec.gov.br/portaldoprofessor/matematica/condigital2/midias/experimentos/Geometria_e_arte/episodios/ep_13.html
- <http://engenhariadepapel.blogspot.com.br/2013/07/caleidociclo-ciclo-da-chuva.html>
- http://www.mentesabsorventes.com/wp-content/uploads/2013/08/kaleidocycle_sistemasolar.jpg.pdf
- <http://engenhariadepapel.blogspot.com.br/2011/06/formas-geometricas-de-escher-monte-as.html>

Caleidociclo IsoAxis



Referências

- História do Caleidociclo
http://webeduc.mec.gov.br/portaldoprofessor/matematica/condigital2/midias/experimentos/Geometria_e_arte/index.html
- http://www.pibid.ufpr.br/pibid_new/uploads/matematica2011/arquivo/362/Caleidociclos.pdf
- Plano de Aula
http://www.pibid.ufpr.br/pibid_new/uploads/Interdisciplinar2009/arquivo/574/PLANO-DE-AULA-PIBID-CALEIDOCICLOS.pdf

Calendário de caleidociclo

http://mat.absolutamente.net/recursos/utl/calendario/2015_fb.png