INSTITUTO DE MATEMÁTICA

Universidade Federal do Rio de Janeiro

Meditações

Uma modesta proposta

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Preâmbulo

Aqui eu explico alguma coisa do titulo/autor

Section 1

Origami - Uma arte

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O que é Origami

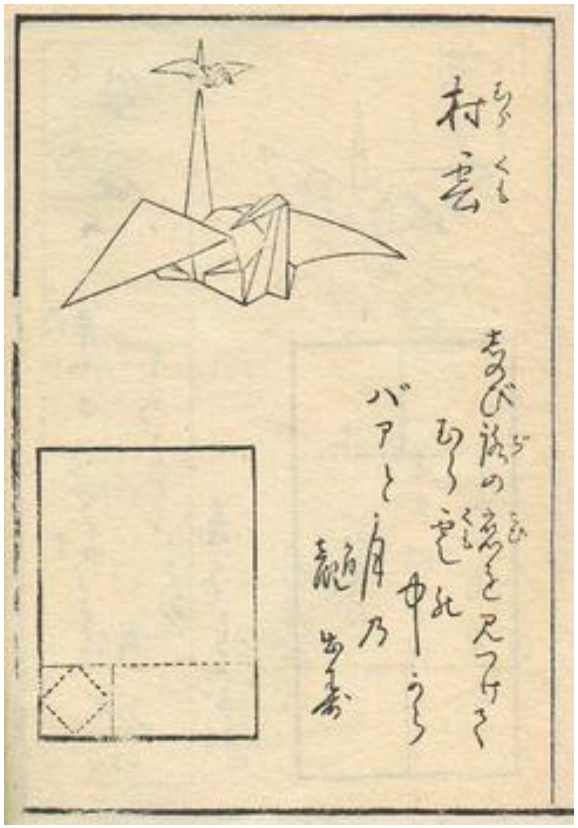
Uma arte tradicional japonesa

A arte de fazer Origamis

- Século VI em celebrações religiosas;

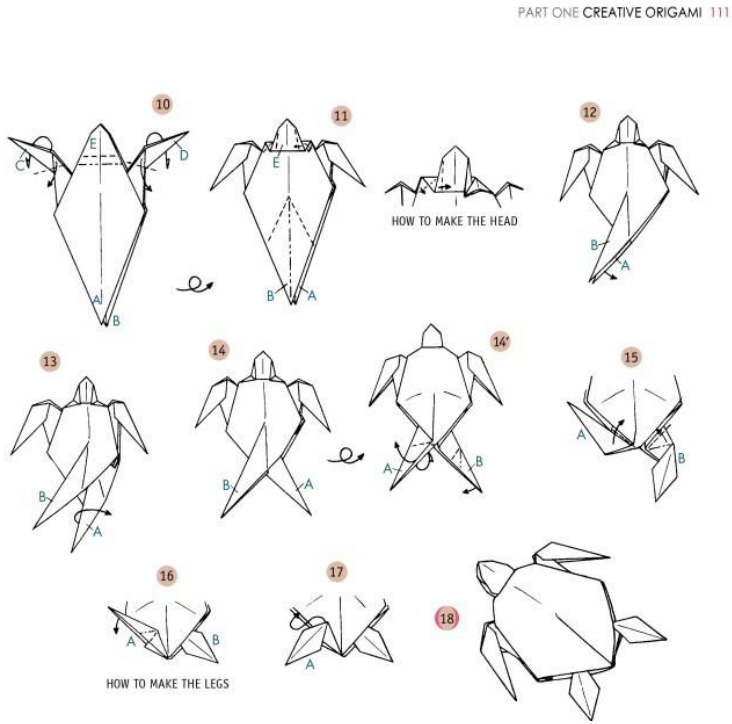
A arte de fazer Origamis

- No século VI, em celebrações religiosas;
- Séculos XVIII e XIX;



A arte de fazer Origamis

- Século XX...
- Akira Yoshizawa



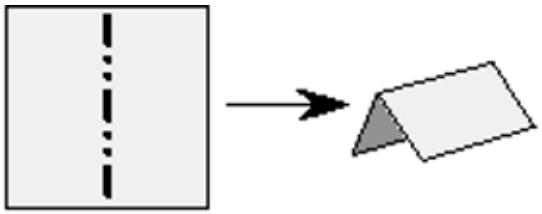
Origami? Nani!?

- "Black Forest Cuckoo Clock, 1987"

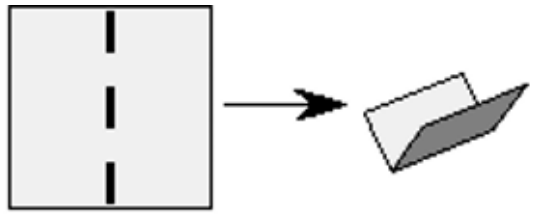
A arte de fazer Matemática!

- "Letting dead people do your work for you", Robert Lang
- O poder da Redução de problemas!

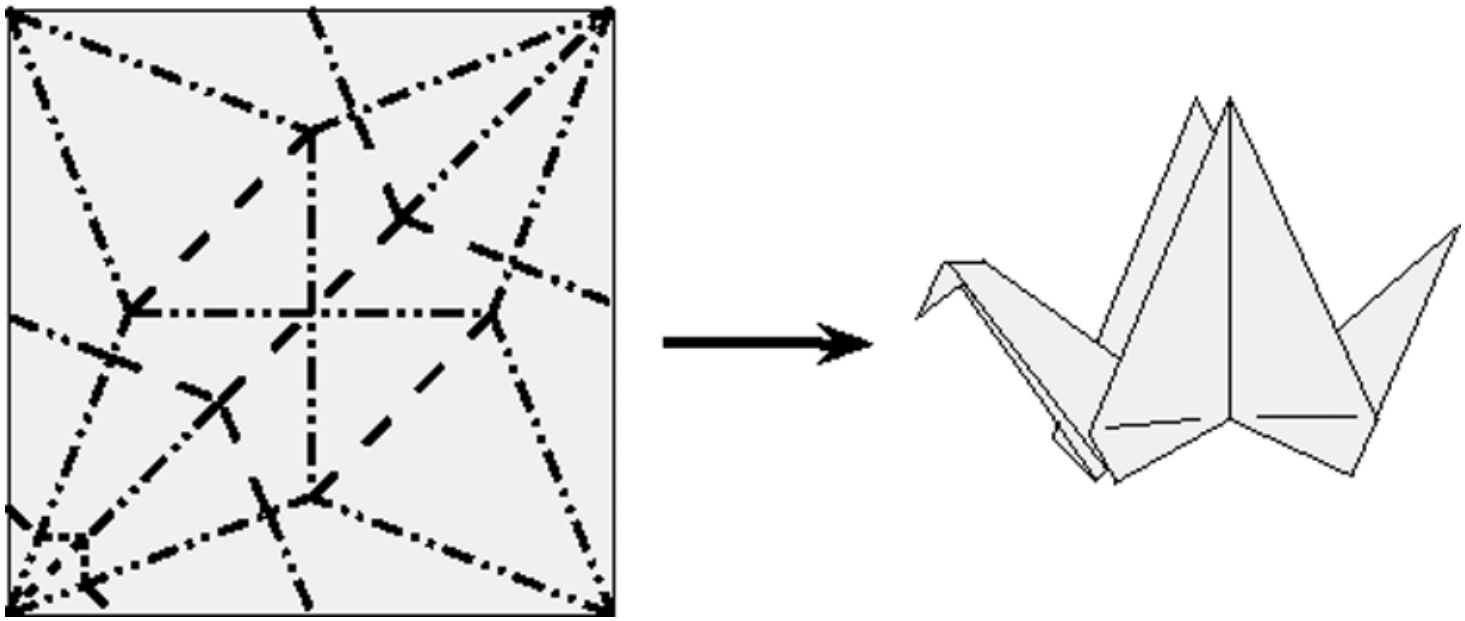
A arte: "Padrões de Dobra"



mountain crease



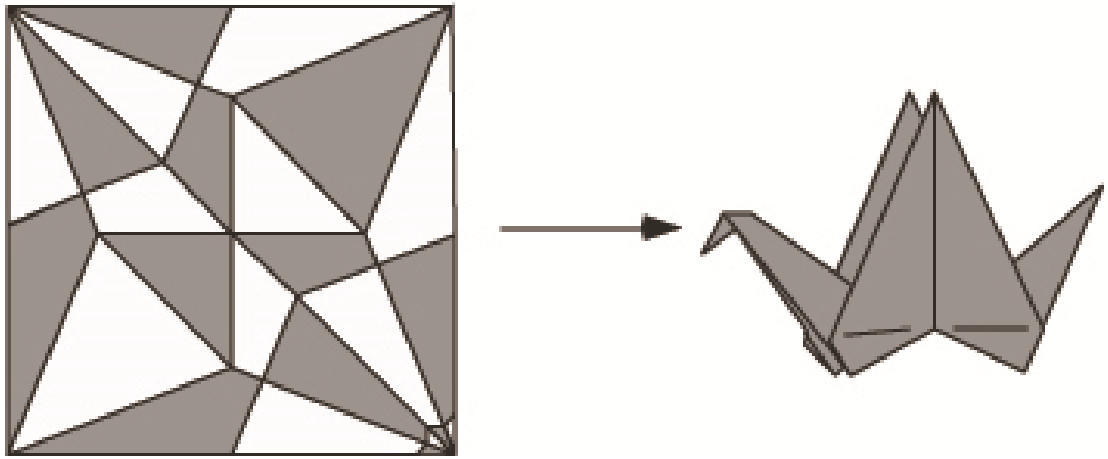
valley crease



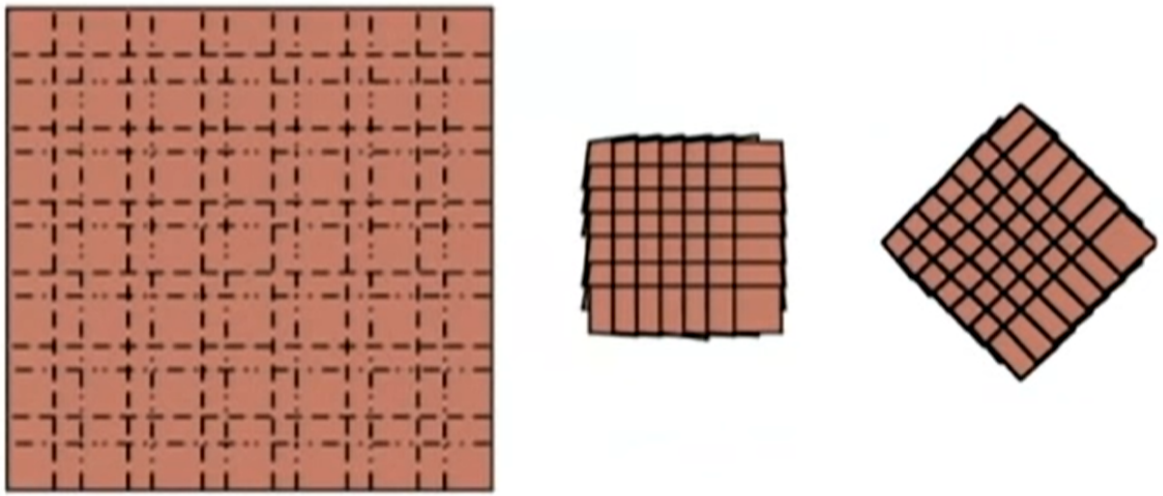
As regras

- 2-Colorível
- Numero de vales - montanhas = ± 2
- Ângulos alternados somam π
- Sem auto-interseção

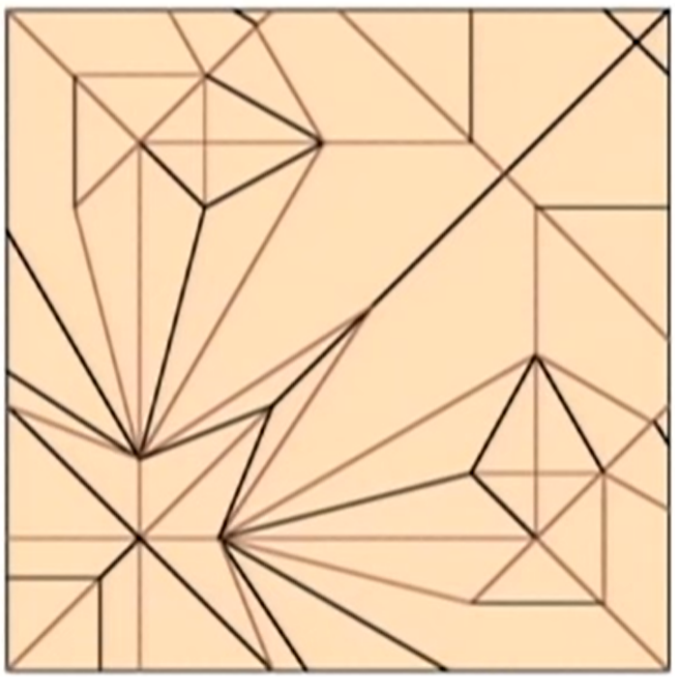
As regras

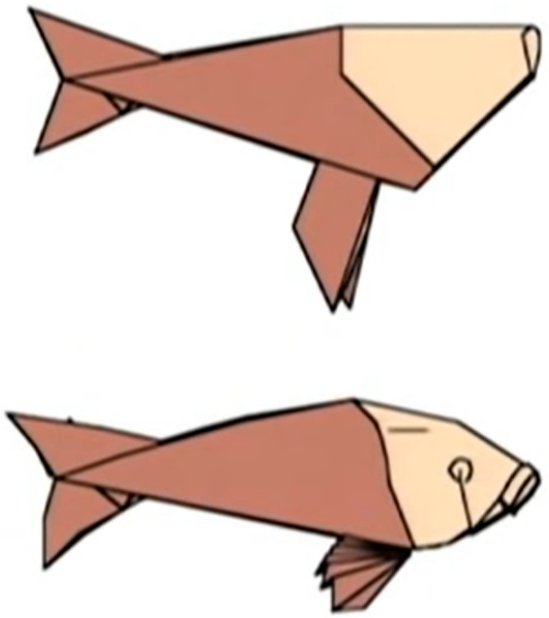


Texturas

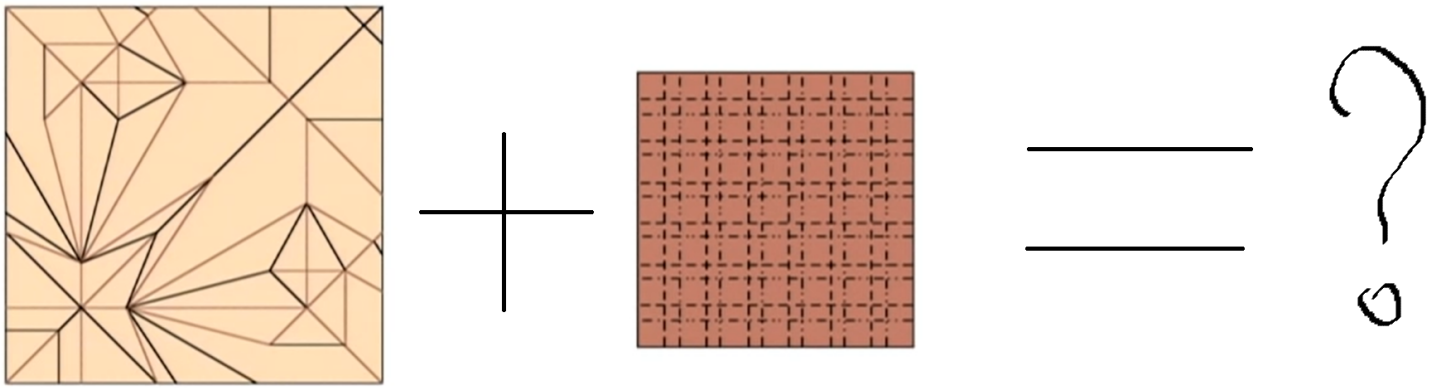


Bases





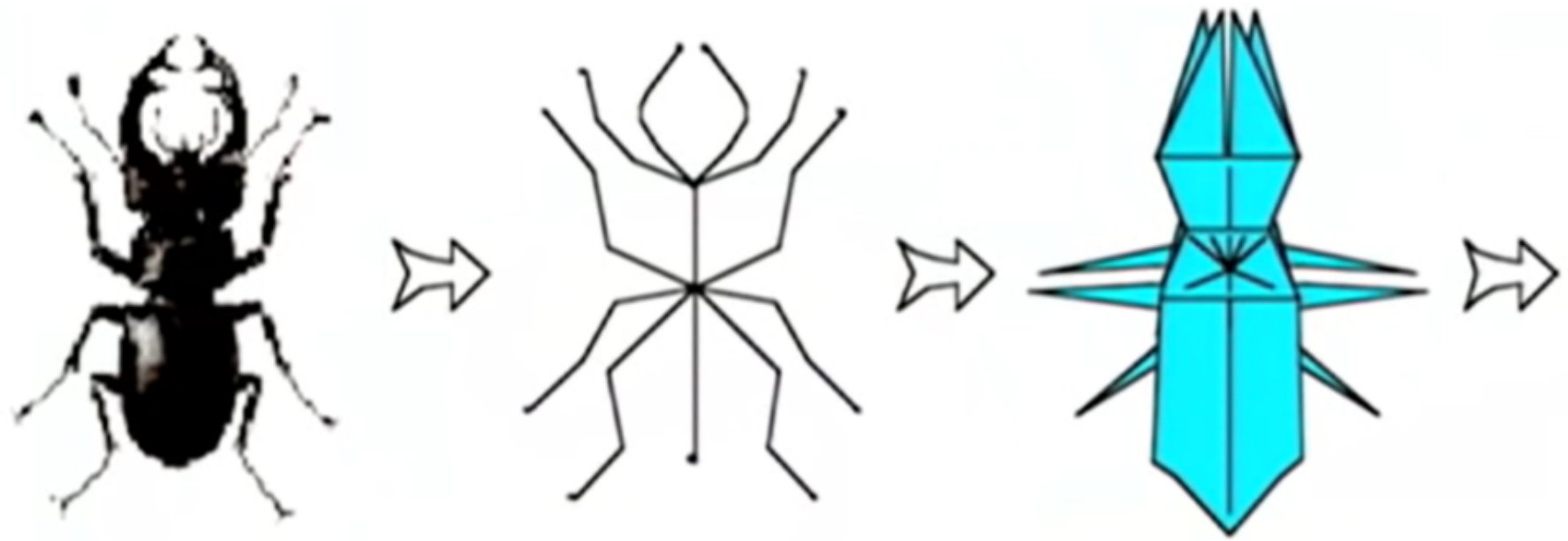
Uma conta?



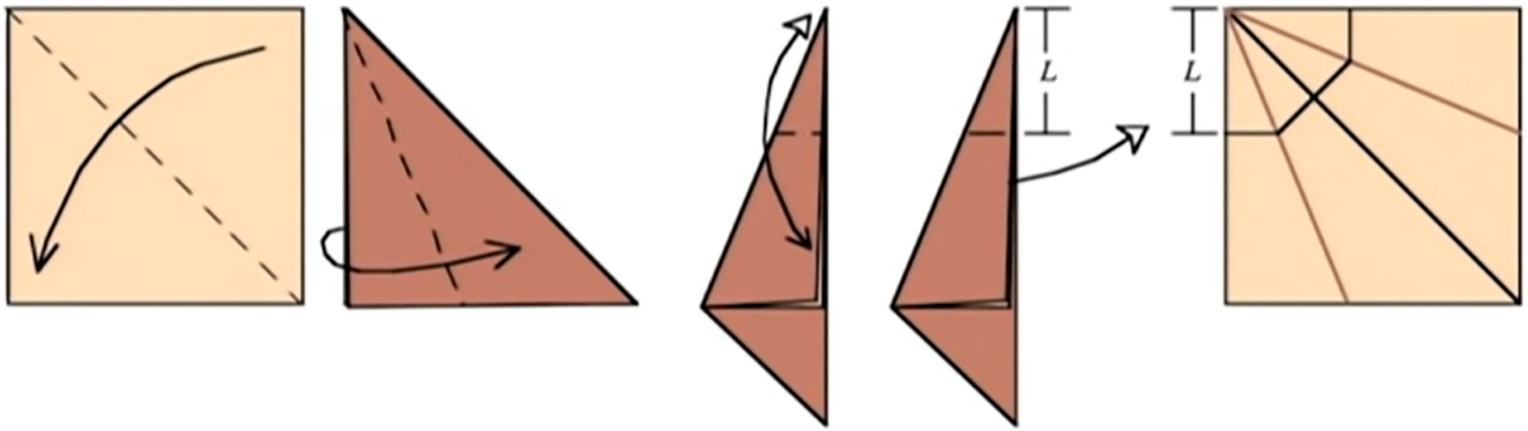
É magia, o nome

O problema: design

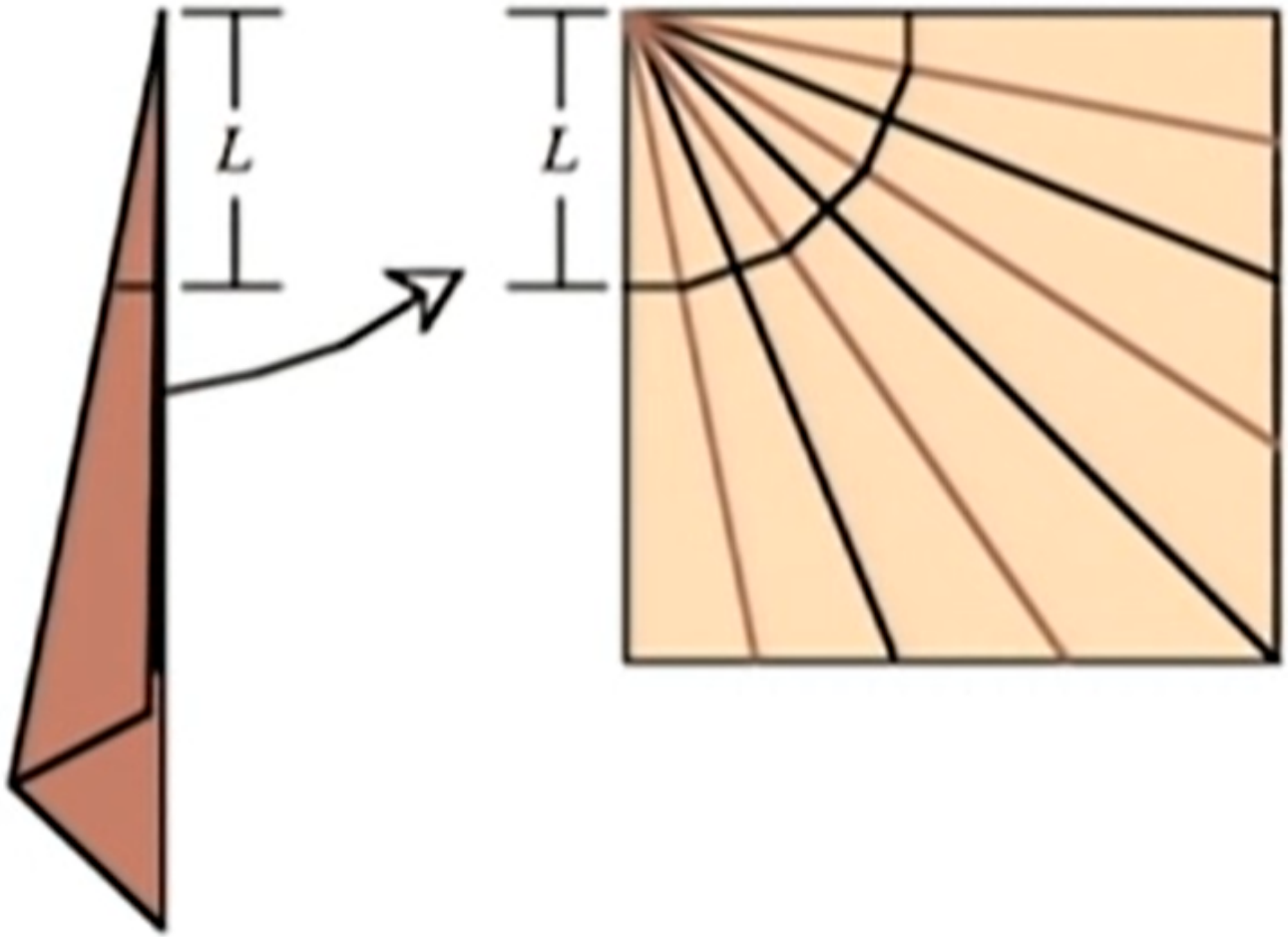
Uma solução: abstração



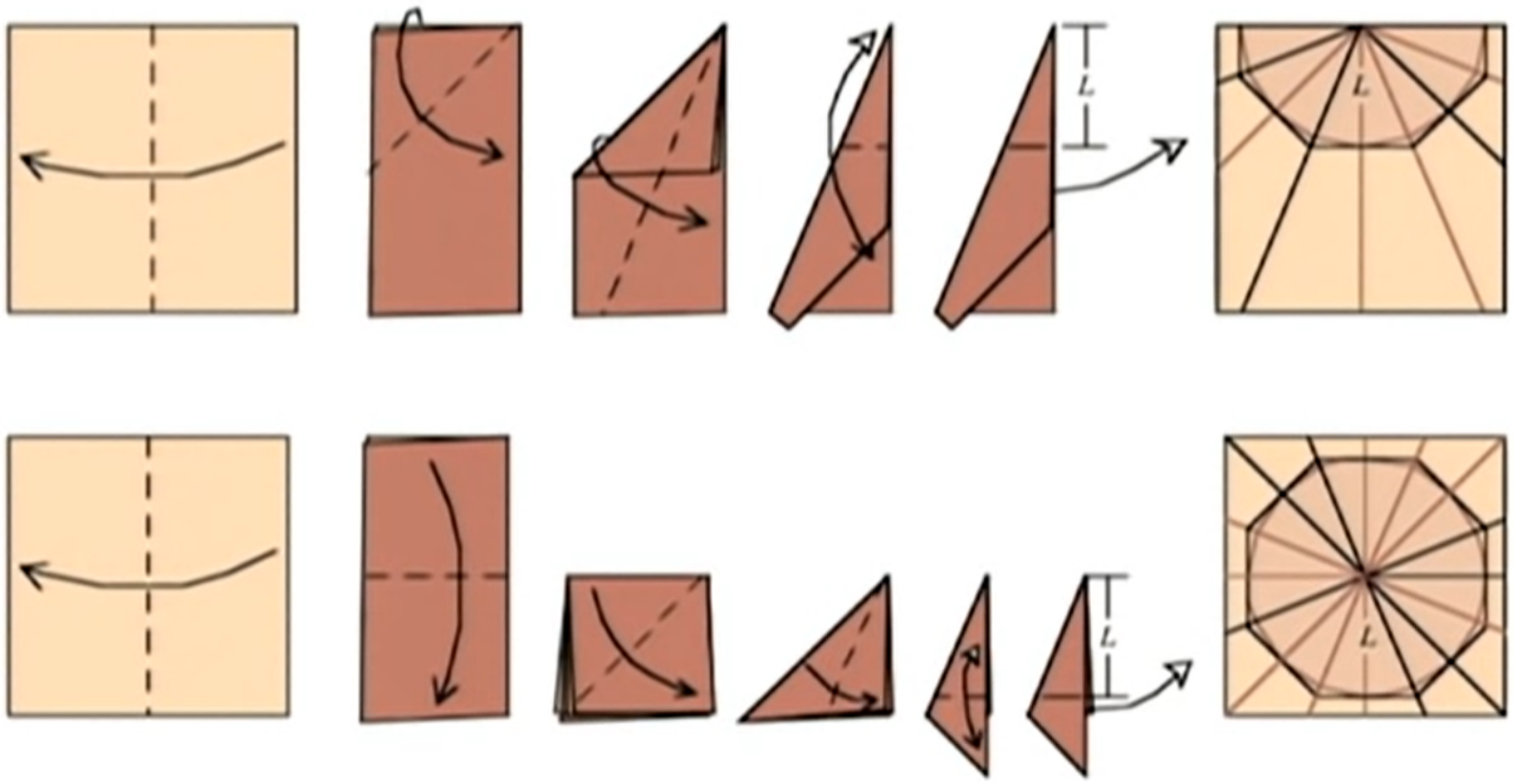
Uma breve oficina de perninhas



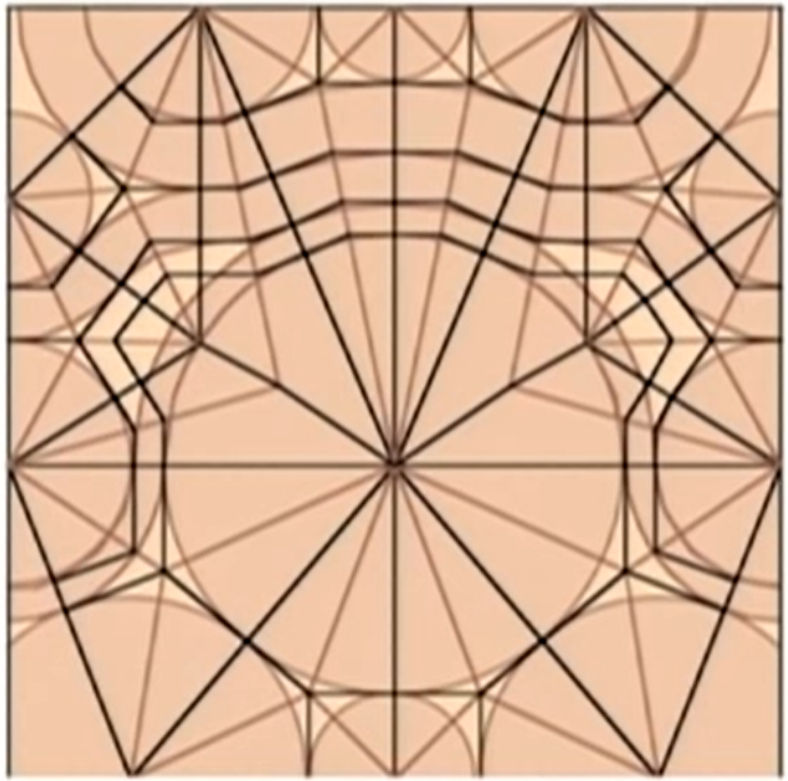
Uma breve oficina de perninhas

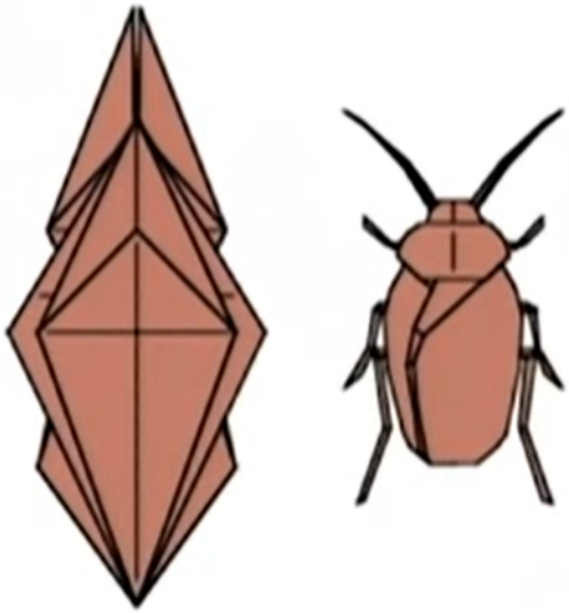


Uma breve oficina de perninhas



O problema de empacotar bolas





A arte

Section 2

Origami – Uma ferramenta

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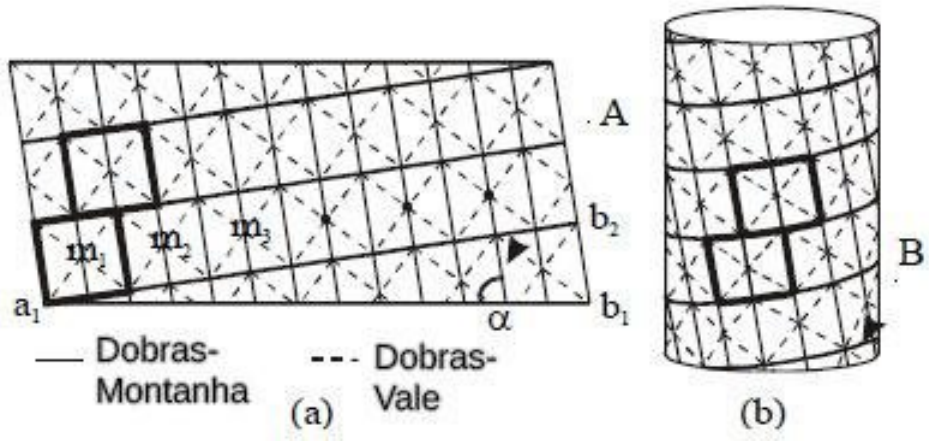
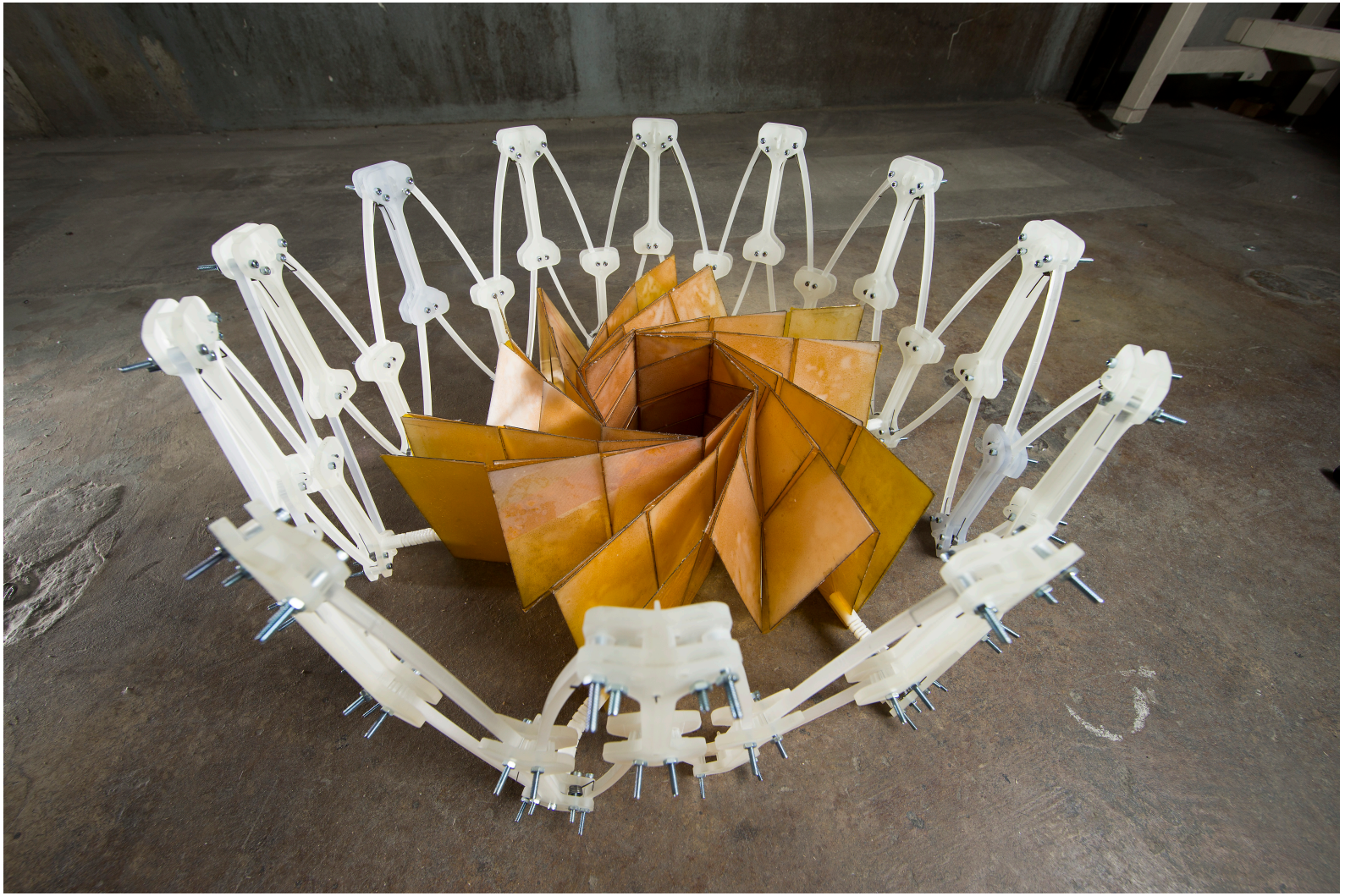
Aplicações
O problema de transporte

- Áreas biomédicas
- Tecnologia aeroespacial

Áreas biomédicas - Extente cardíaco

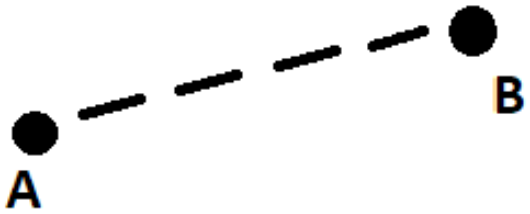


Tecnologia aeroespacial - Velas Solares

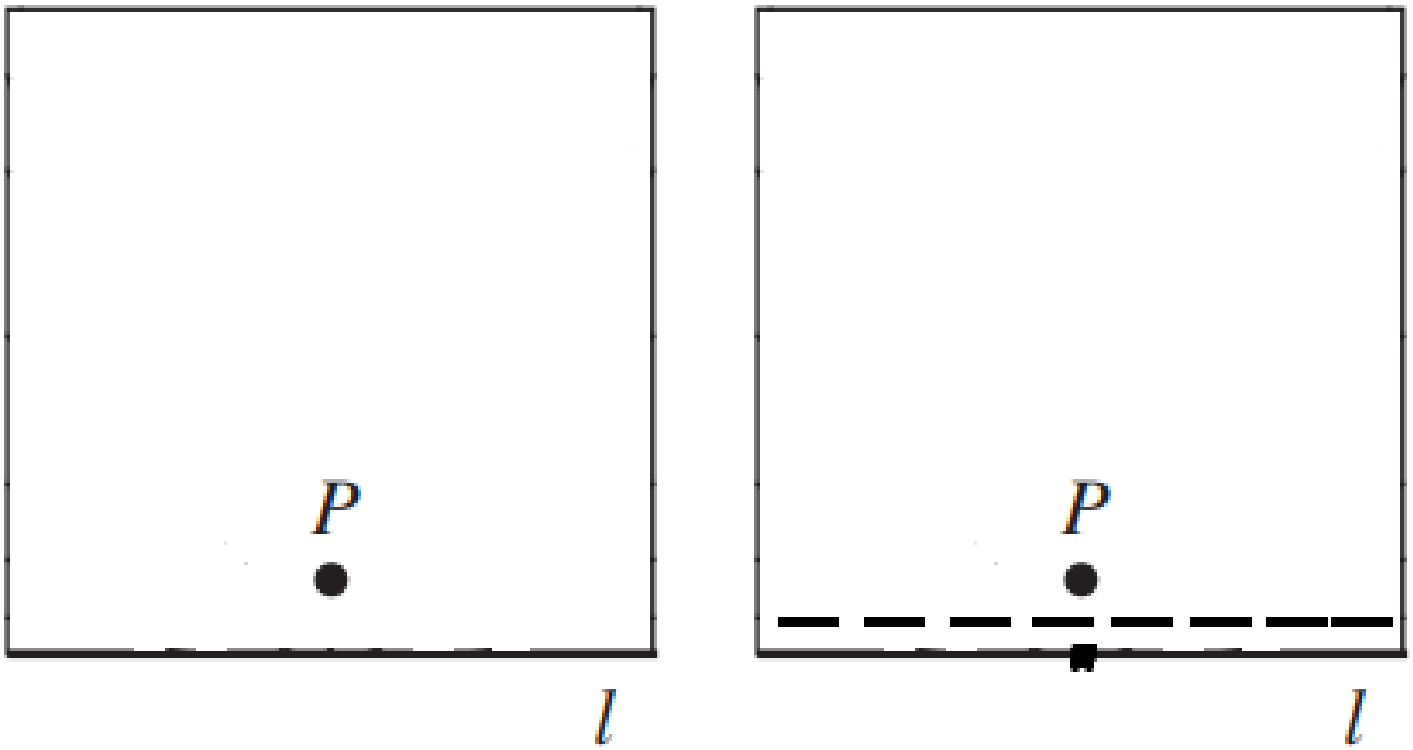


Tecnologia aeroespacial - Velas Solares

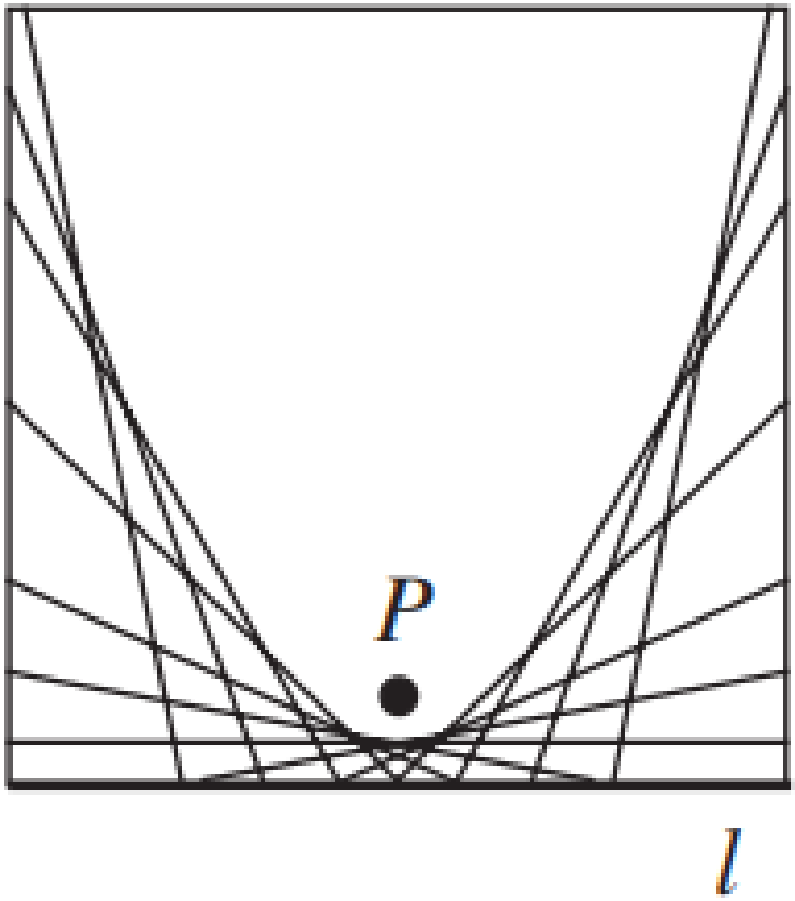
Ferramentas geométricas



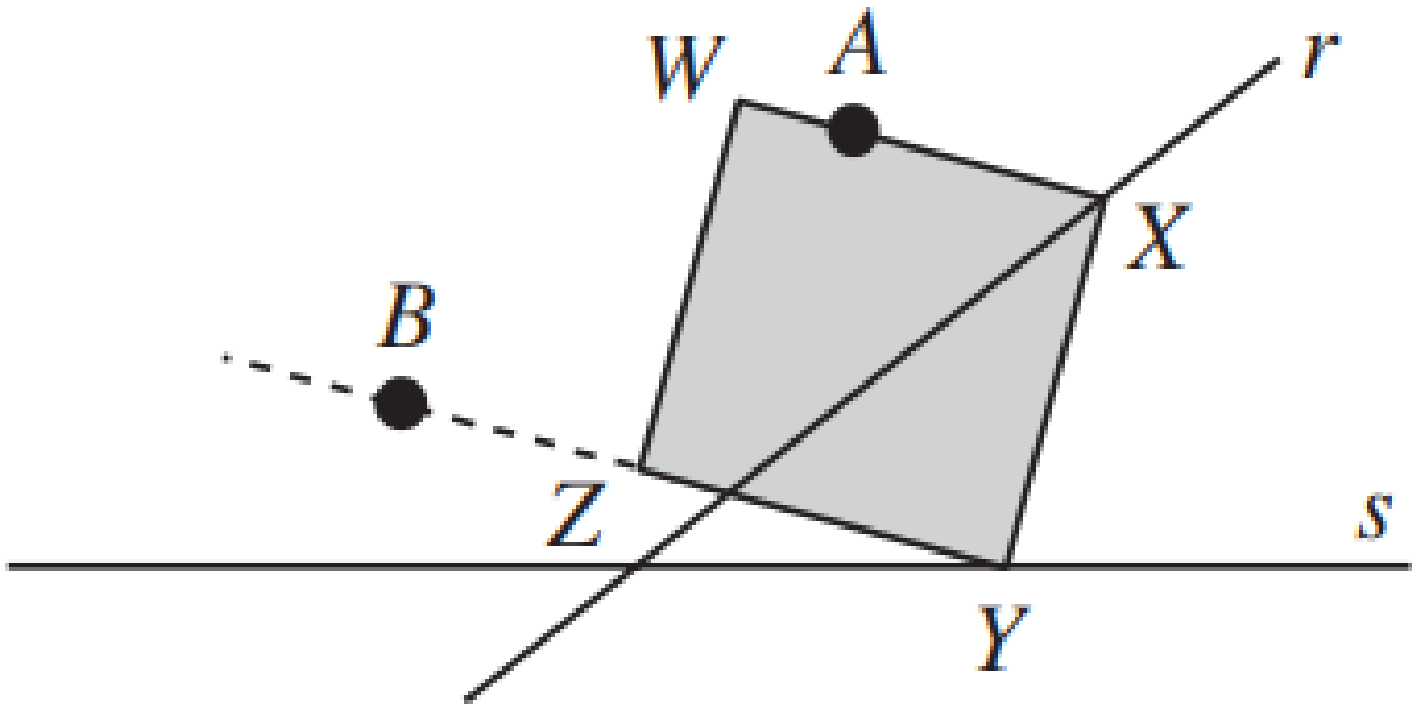
Ferramentas geométricas



Ferramentas geométricas



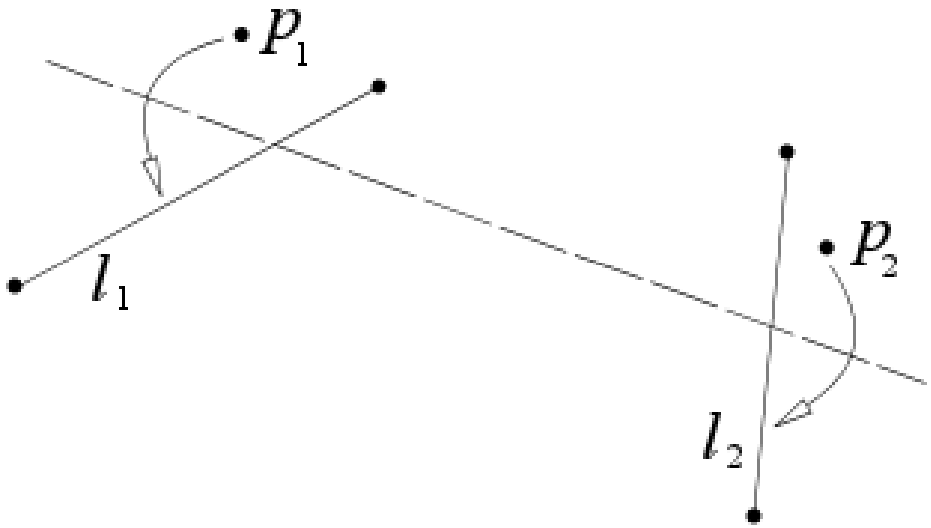
O quadrado de Margaritha Beloch



Problemas clássicos gregos

- 'Dobrar o Cubo'
- Trisecção do Ângulo
- Beloch resolve os dois com origami!

Ideias de Beloch

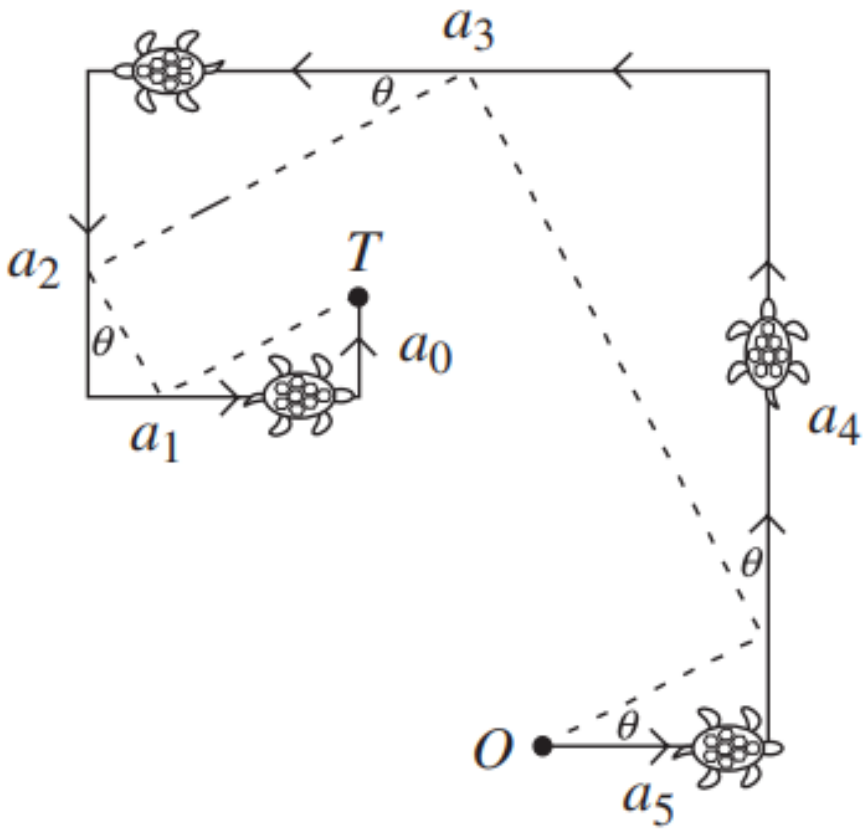


Ideias de Beloch

O método de Lill

$$p(x) = a_5x^5 + a_4x^4 + a_3x^3 + a_2x^2 + a_1x^1 + a_0x^0$$

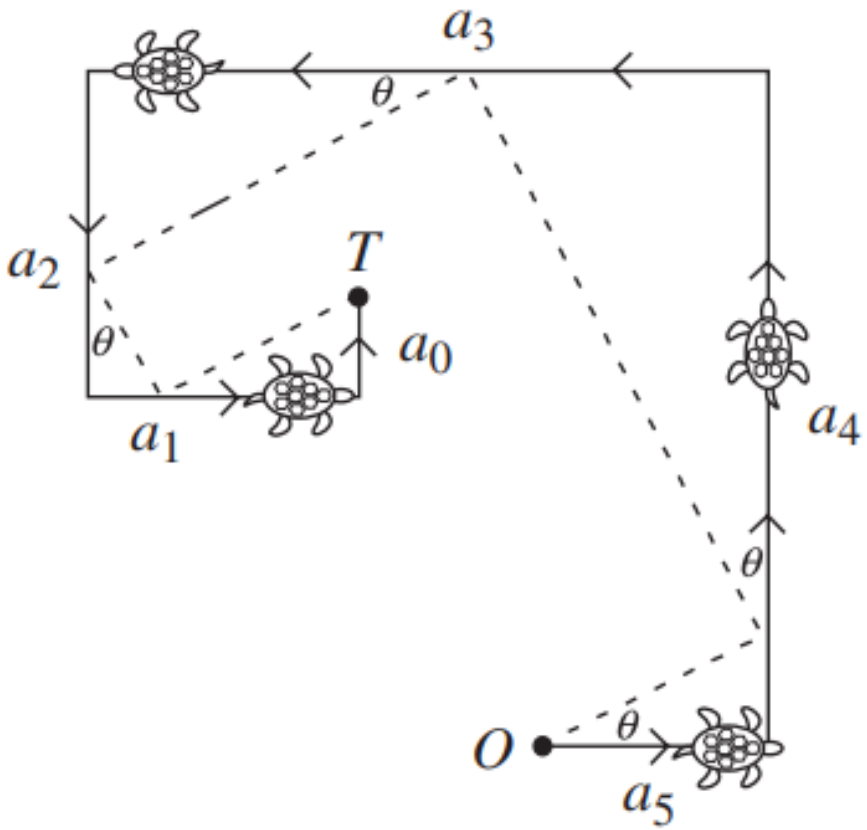
$$p(x) = 3x^5 + 13x^4 + 10x^3 + 5x^2 + 3x^1 + 1$$



O método de Lill

$$p(x) = 3x^5 + 13x^4 + 10x^3 + 5x^2 + 3x^1 + 1$$

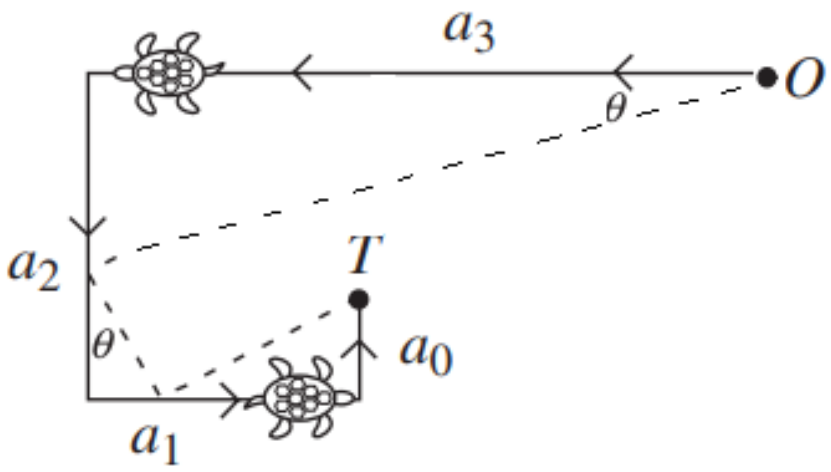
$x = -\tan(\theta)$ é raiz!



O método de Lill

$$p(x) = 10x^3 + 5x^2 + 3x^1 + 1$$

$x = -\tan(\theta)$ é raiz!



Questions?

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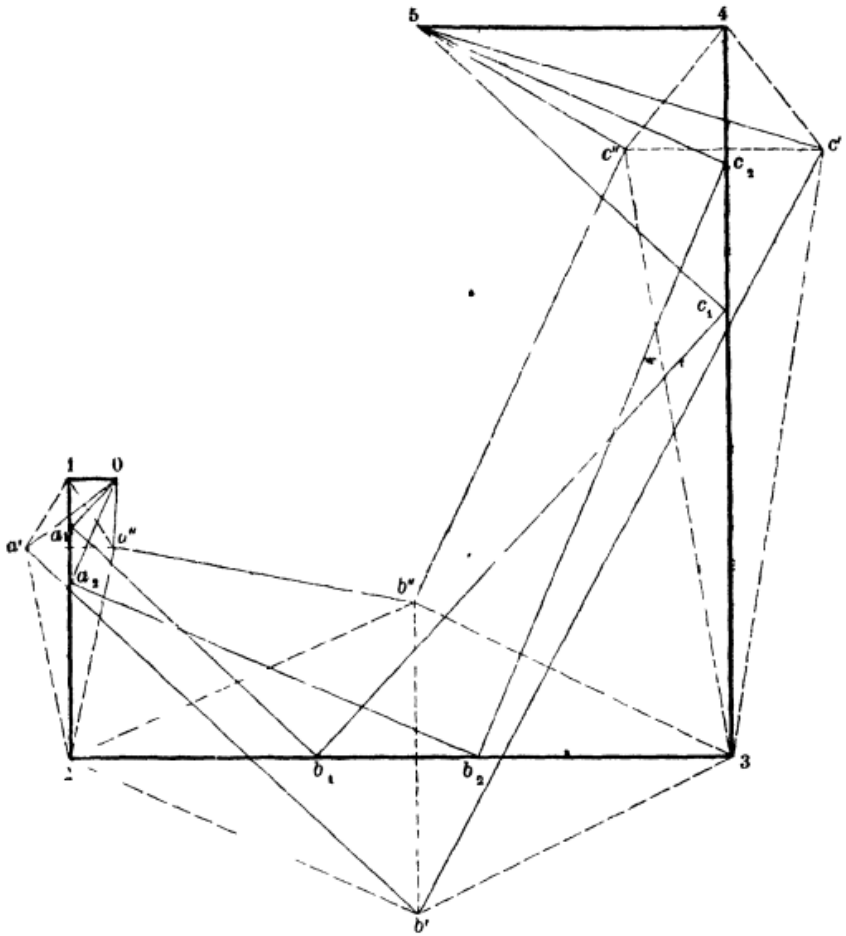
O método de Lill - Imaginário

Pour bien fixer les idées, soit

$$x^4 - 6x^3 + 14{,}25\,x^2 - 15{,}75\,x + 6{,}5 = 0$$

O método de Lill - Imaginário



Section 3

References

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References I