Straightedge and Compass Numbers Versus Origami Constructible Numbers

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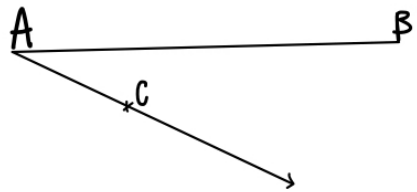
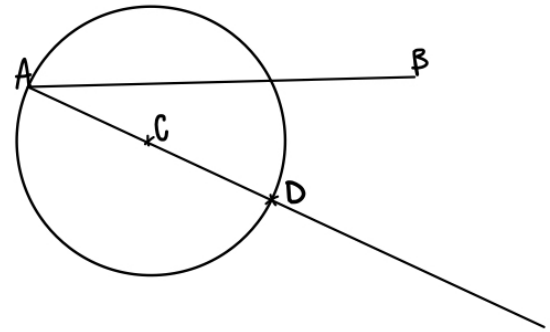
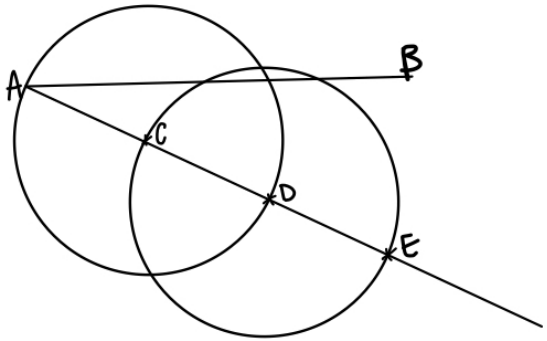
Straightedge and Compass Constructions

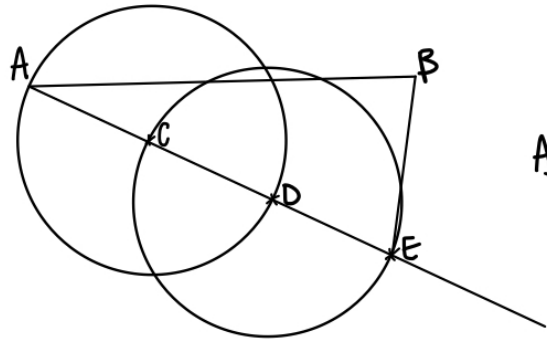
1. Creating the line through two existing points
2. Creating the circle through one point with center another point
3. Creating the point which is the intersection of two existing, non-parallel lines
4. Creating the one or two points in the intersection of a line and a circle (if they intersect)
5. Creating the one or two points in the intersection of two circles (if they intersect).

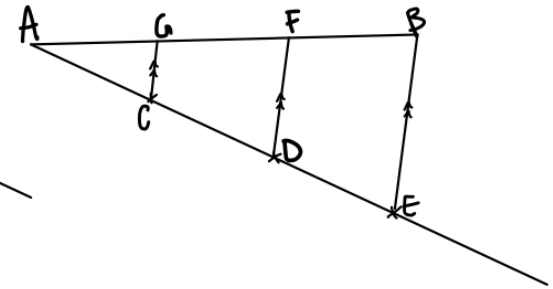
Constructing the Integers and Rationals



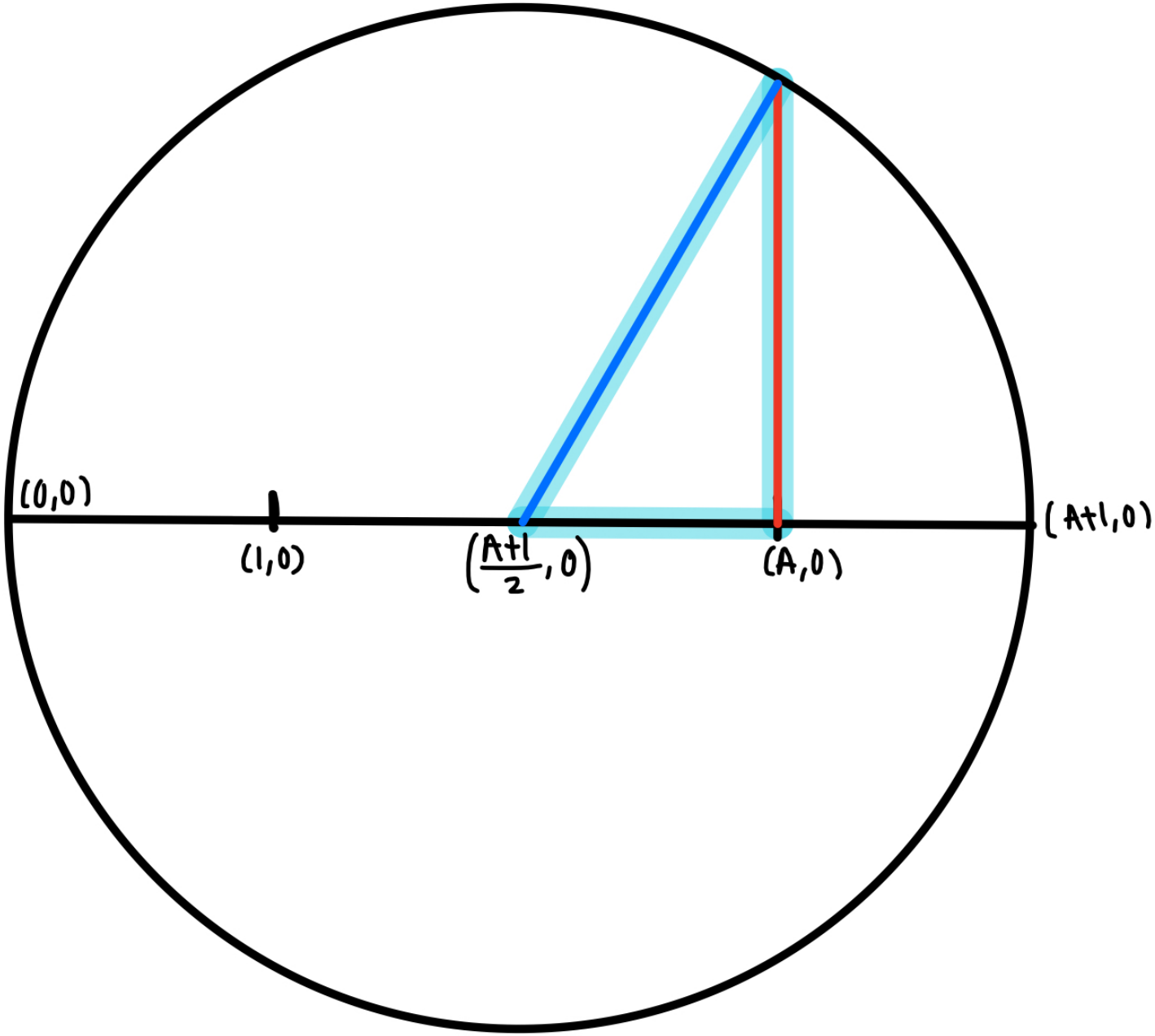








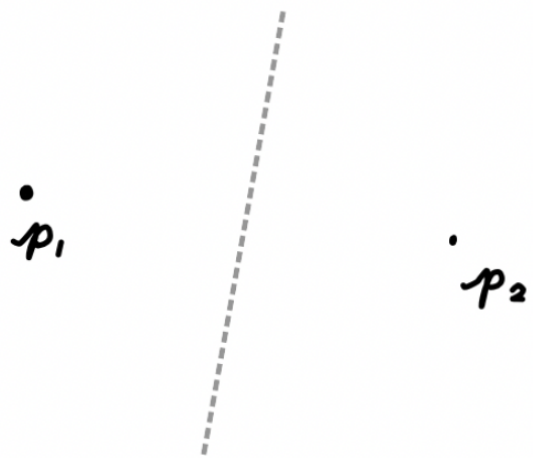
Constructing the Square Root



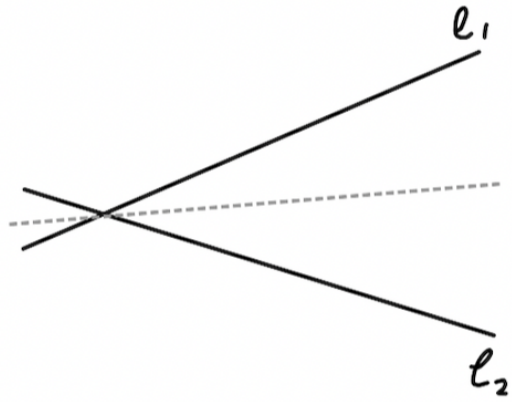
Origami's Expansion of the Constructible Field

Given two distinct points p1 and p2, there is a unique fold that passes through both of them.

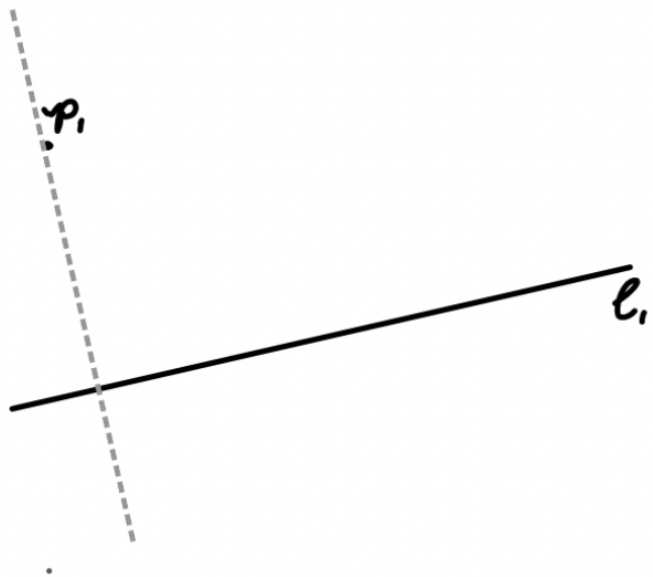
Given two distinct points p1 and p2, there is a unique fold that places p1 onto p2.



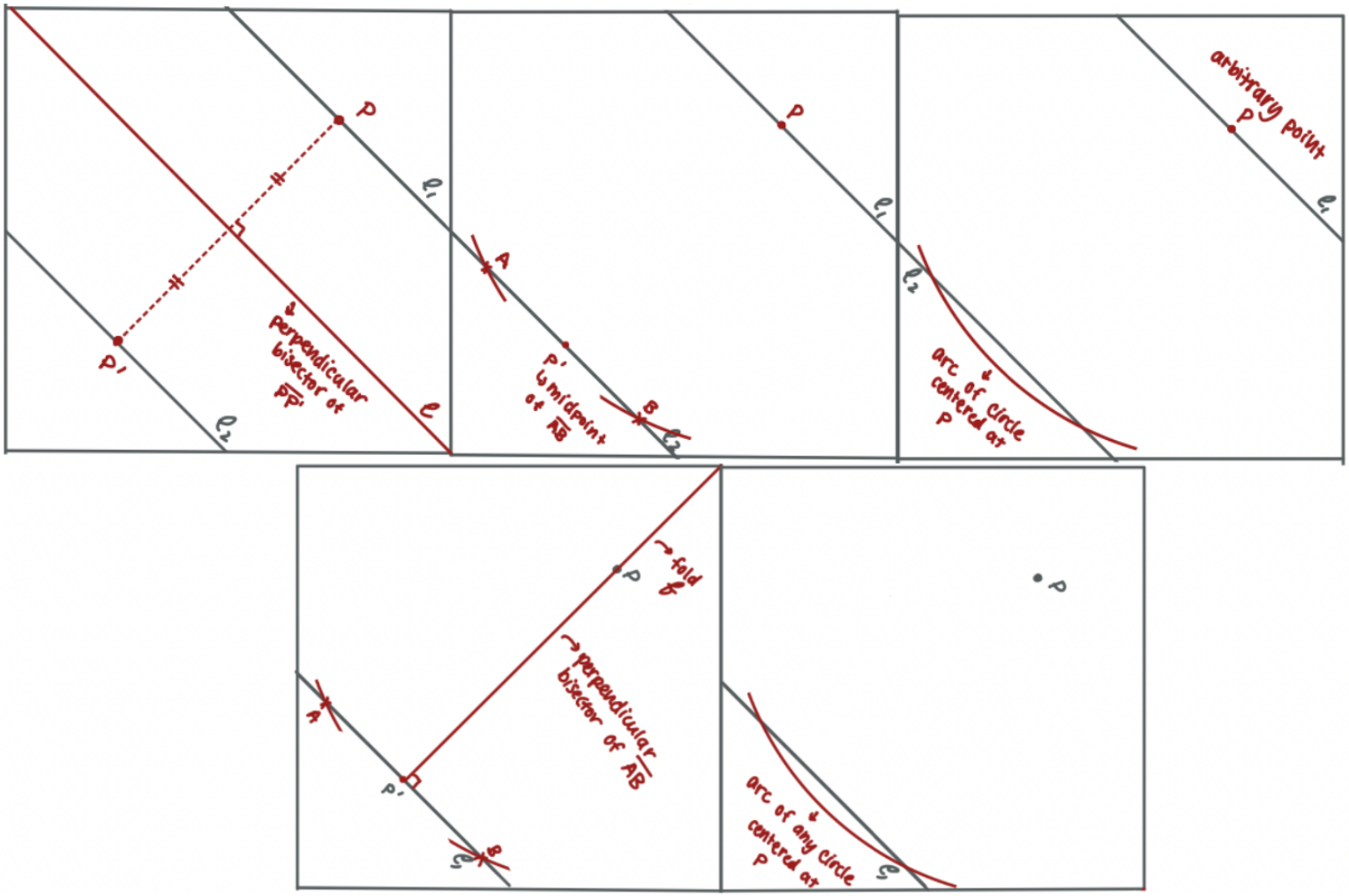
Given two lines l1 and l2, there is a fold that places l1 onto l2.



Given a point p1 and a line l1, there is a unique fold perpendicular to l1 that passes through point p1.



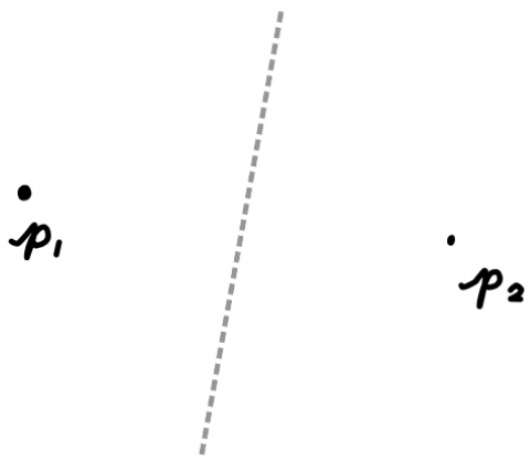
Axioms 3 and 4 with Straightedge and Compass



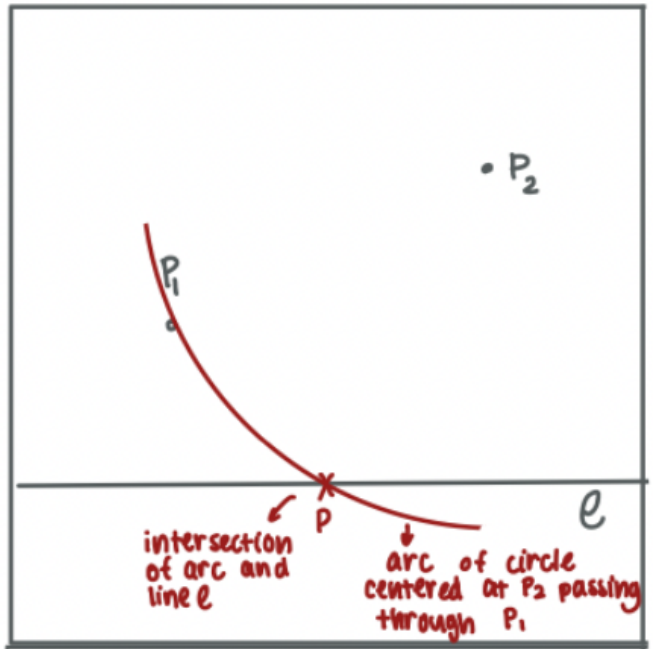
Origami's Expansion Pt 2

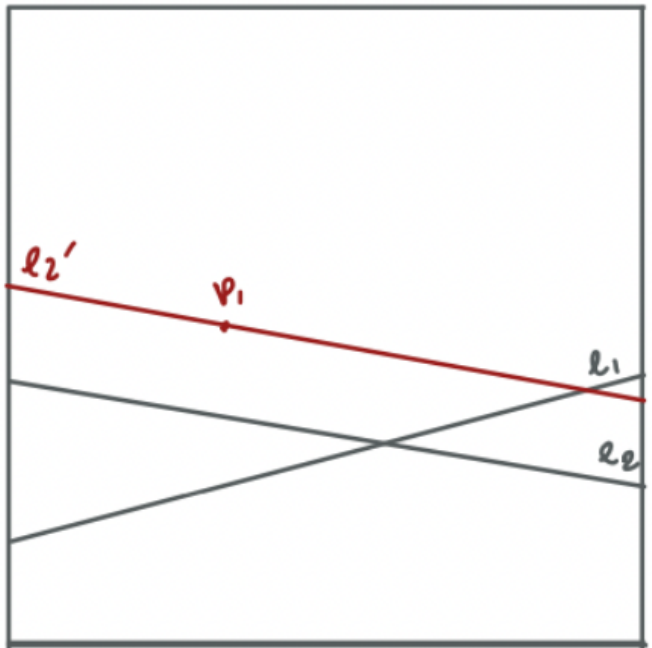
Given two distinct points p1 and p2, there is a unique fold that passes through both of them.

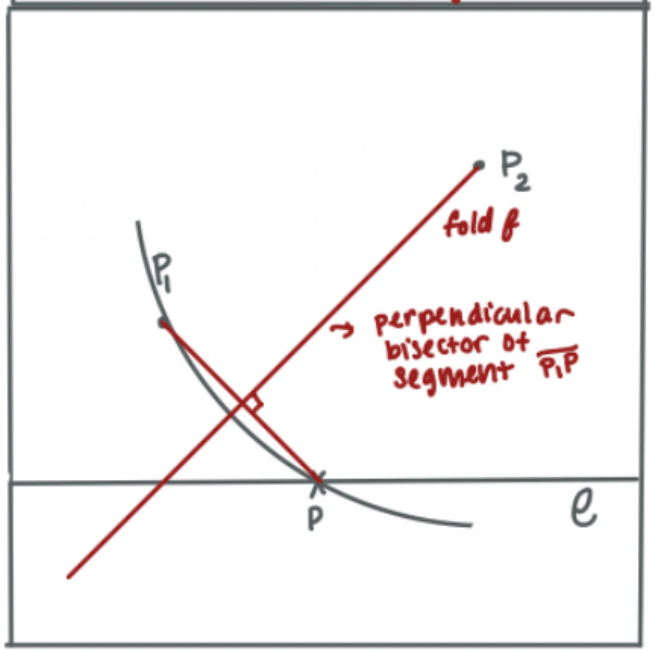
Given two distinct points p1 and p2, there is a unique fold that places p1 onto p2.

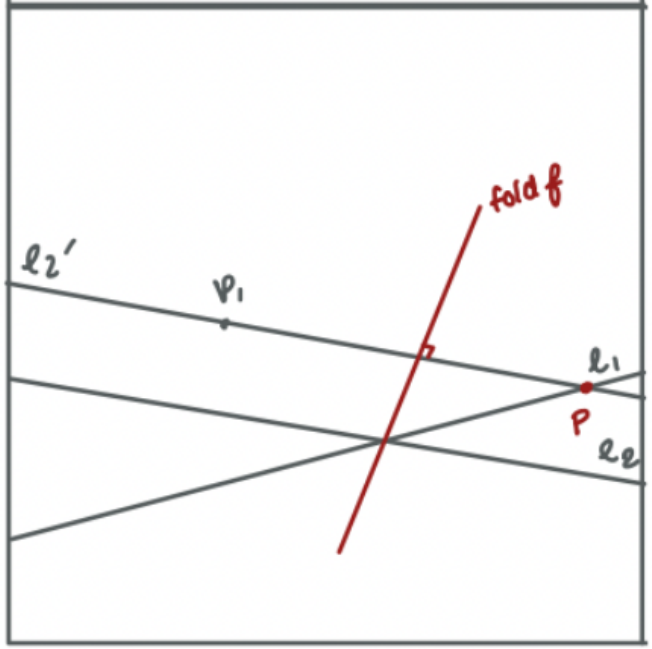


Axioms 5 and 6 with Straightedge and Compass





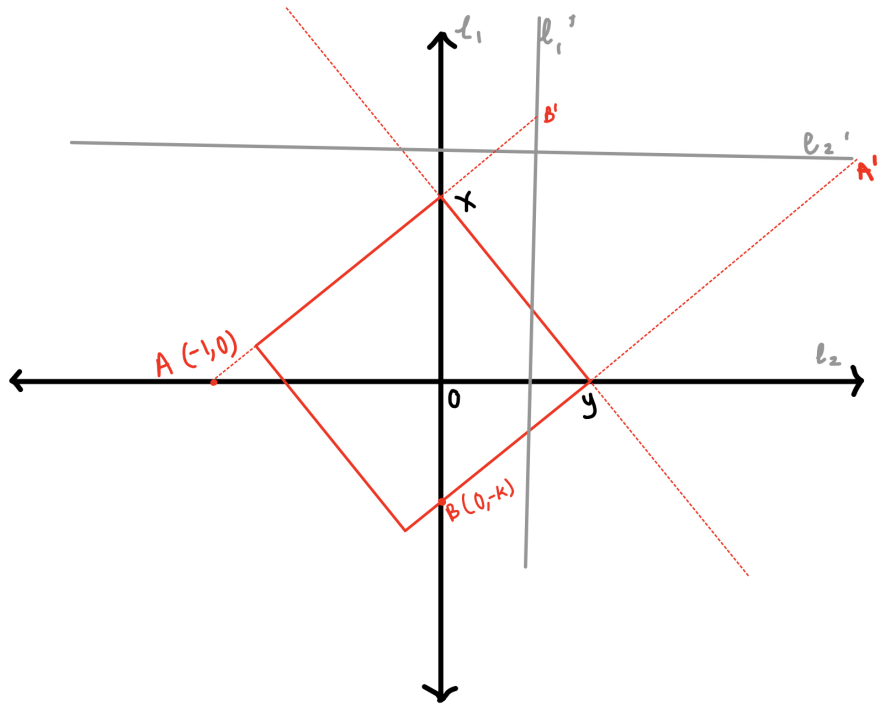




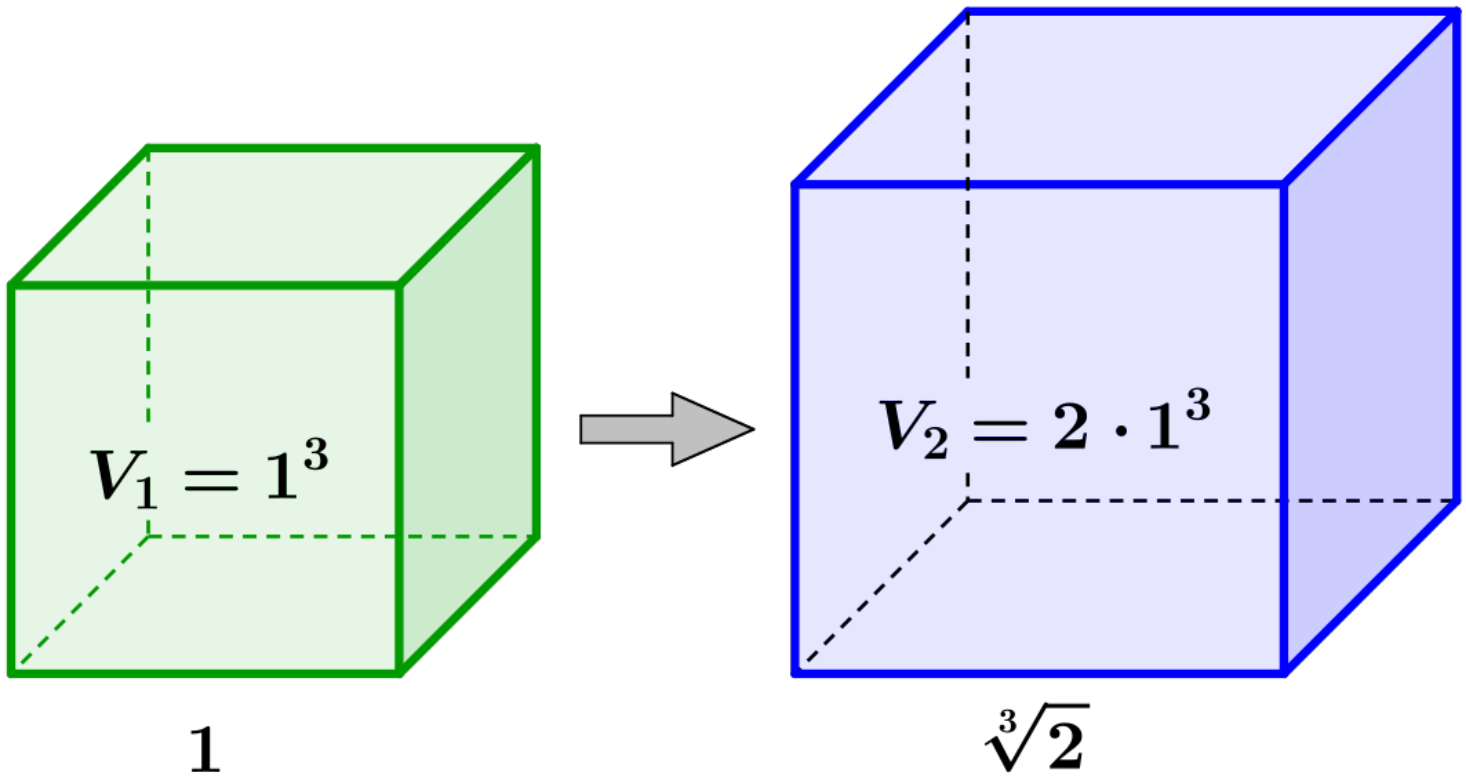
The Beloch Fold and Square

Given two points p1 and p2 and two lines l1 and l2, there is a fold that places p1 onto l1 and p2 onto l2.

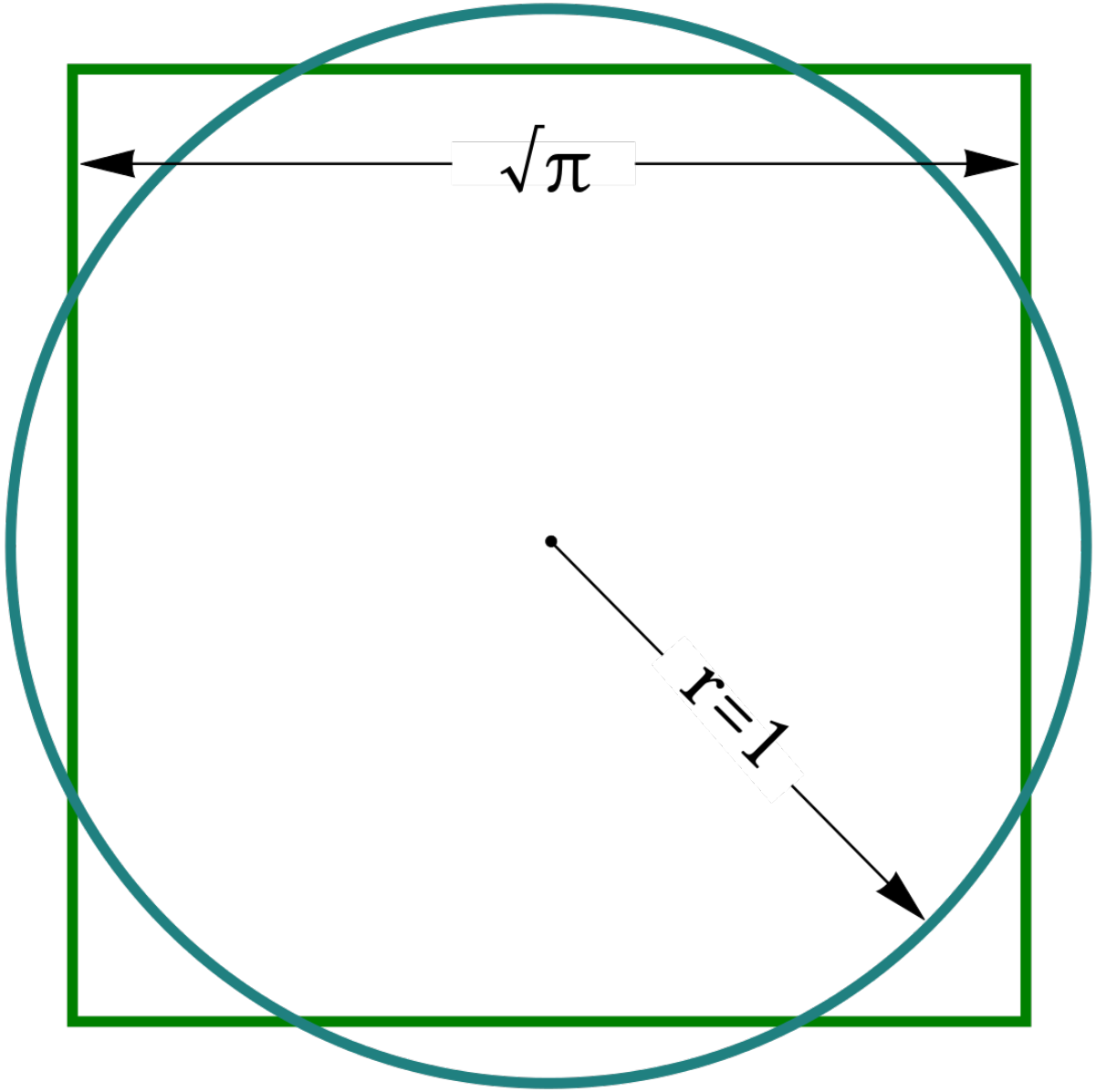
Given two points A and B and two lines l_1 and l_2, a Beloch square is a square XZWY such that X and Y lie on l_1 and l_2 respectively, A lies on line XZ and B lies on line YW.



Doubling the Cube



Squaring the Circle



Extra Articles

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