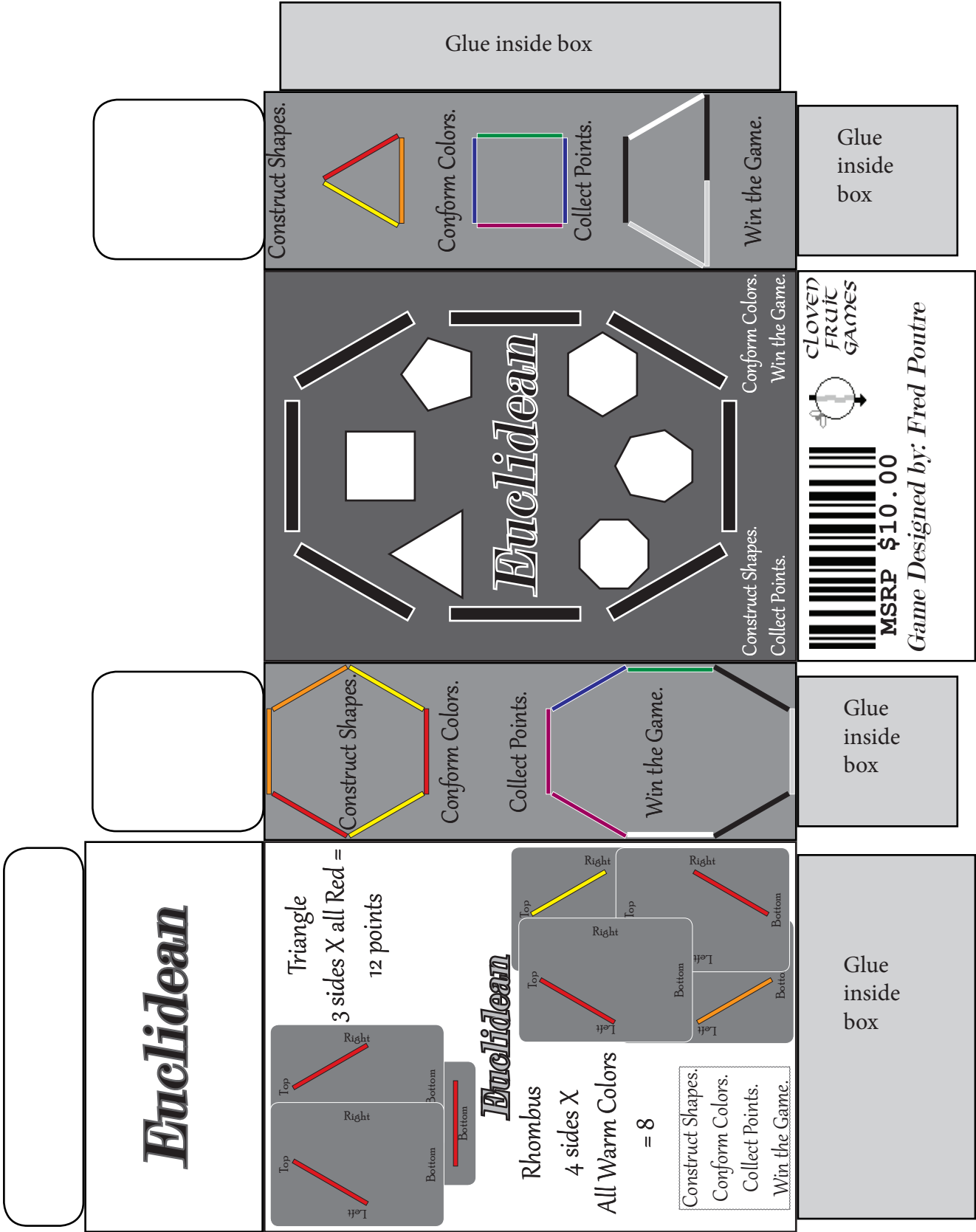


Print out on cardstock.  
Cut out and glue or tape together for box.



# Euclidean

Euclidean: of, relating to, or based on the geometry of Euclid or a geometry with similar axioms

Polygon: a closed plane figure made up of several line segments that are joined together.  
The sides do not cross each other.  
Exactly two sides meet at every vertex.



Euclidean is a card game of shape building and color matching. The goal is to build the greatest number sided polygon, with all the same color or color-themes.

Each card has a line set at an angle, defined by the location on the card (which is marked for: top, bottom, left, and right).  
As an example- cards with the lines \ / \_  
Could be made to form a triangle / \_\  
See Visual examples of play.

Each line comes in one of nine colors (red, orange, yellow, green, blue, purple, black, grey, or white).  
Building a triangle of all yellow, for instance, is worth more points than a triangle made of red and purple. Which is worth more than one made of red, orange, and yellow. Which is worth more than made of red, yellow, and green.

Single colored shapes give the greatest bonus. Adjacent color shapes give the next best bonus. All Warm, all Cool, or all Stark colors give the next best bonus. Other color combinations give no bonus. See the Color wheel card for explanations of Adjacent, Warm, Cool and Stark colors.

Euclid is often referred to as the "Father of Geometry."  
Among his works are the basics of plane geometry, which are taught even today as basic Geometry in elementary and secondary school.

When most people think Geometry they think of the principles set down by Euclid.

## Floating

A Player may use all his or her cards to make shapes; thus not having a discard. This is called Floating.

Play continues as per normal. The next turn of course the Player will draw and discard. At that point the remaining Players still gain their additional turn.

Essentially this gives the remaining Players an extra turn in which to place down shapes.

Floating Players are not Out, thus they do not gain the bonus for First Out.

## Playing with Multiple Decks

Euclidean plays best with 2 to 9 players; the assumption of 9 players is based on using the Stark Colors to have a full range of 9 colors, not using the Stark Colors as color replacements for those that have difficulty distinguishing certain colors.

However, for some games (such as Oct-um), it kind be difficult to obtain the correct cards to achieve the shape, if there are a greater number of players. Thus, if multiple decks can be used to increase the card count, to play with larger groups or have a more versatile deck (allowing for more possible shapes and higher scoring overall).

Games are named for the number of cards dealt and the shapes aimed for in the game.

Tri-um: is a game in which the players are attempting to only make triangles (three-sided shapes).

Quad-um: is a game in which the players are attempting to only make quadrilaterals (four-sided shapes; squares, rhombuses, rectangles, trapezoids, and parallelograms).

Pent-um: is a game in which the players are attempting to only make pentagons (five-sided shape).

Hex-um: is a game in which the players are attempting to only make hexagons (six-sided shapes).

Sept-um: is a game in which the players are attempting to only make septagons (seven-sided shapes, sometimes called heptagons).

Oct-um: is a game in which the players are attempting to only make octagons (eight-sided shapes).

Omnis-um: is a game in which the players are attempting to only make any of the shapes, up to the number of sides of the card count (maximum eight).

Three-card each player receives 3 cards, limiting the game to Tri-um. This is a quick play game that is highly based on the random luck of the draw, mostly determined by color matching bonuses.

Four-card each player receives 4 cards, limiting the game to Tri-um, Quad-um, and Omnis-um (with 3 or 4 sided shapes).

Five-card each player receives 5 cards, limiting the game to Tri-um, Quad-um, Pent-um, and Omnis-um (with 3, 4, or 5 sided shapes).

Six-card each player receives 6 cards, limiting the game to Tri-um, Quad-um, Pent-um, Hex-um, and Omnis-um (with 3, 4, 5, or 6 sided shapes).

Seven-card each player receives 7 cards, limiting the game to Tri-um, Quad-um, Pent-um, Hex-um, Sept-um, and Omnis-um (with 3, 4, 5, 6, or 7 sided shapes).

Eight-card each player receives 8 cards, allowing for all games.

Quad-us is a game special game of Quad-um, where the type of quadrilateral allows for extra bonus scoring. This scoring can be incorporated into Omnis-um.

## Playing with Stark Colors

The Black, Grey, and White colored lines can be used in several ways.

First it allows the expansion of the number of colors from 6 (Rainbow colors) to 9. This allows from more lines available and more difficulty in matching colors or sets of colors.

Second the Black, Grey, and White colored lines can be used as "wild" cards, allowing them to fit into the shape as required by the line placement; but be used as any desired color.

Lastly it allows those people that have difficulty distinguishing certain colors to replace it with Black, Grey, or White. Thus if Bob is red/green color blind he can replace either red or green (obviously this may require outside help) with any of the Stark colors.

See the back side of the color wheel card for a fill in the blank color wheel for use by those that have difficulty distinguishing certain colors.

**Playing**

Each Player is dealt the appropriate number of cards per the chosen card-hand size.  
 The remaining cards (if any) are placed on the table. This is the draw-pile.  
 The top card from the draw-pile is placed next to the draw-pile. This is the discard-pile.  
 The player to the left of the dealer goes first.

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Each turn the player may take the top card from either the discard-pile or the draw-pile.  
 They Player must keep the card if taken from the discard-pile. The Play can either keep or discard the card from the draw-pile.

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Before discarding, if the Player has a shape (as per the game type), he or she can place it down on the table in front of him or her. This Player has the First Down gaining a +1 to his or her shape (which is added before color bonus is multiple).

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The Player is able to discard with no cards in his or her hand has the First Out gaining a x2 to his or her shape (which is calculated after color bonus is multiple and card count bonus is added).

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Once a Player is able to discard with no cards in his or her hand, each of the remaining Players get one additional turn to attempt to complete shapes. Once all the remaining Players have had a turn, the shapes are scored. That is the end of the first set.

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The cards are shuffled and dealt by the Player to the left of the Player who dealt (the first Player of the previous set).

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The game consists of eight sets or until the Players no longer wish to continue to play.

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The winner is the Player with the highest score.

**Optional Rule for Losing Points**

When playing certain combinations of the game (Tri-um with more than three card-hand-size, as an example) there will be left over cards after the shape(s) are laid-down.  
 As an optional rule each card remaining can lessen the Player's score, by subtracting these from the Player's score.

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This becomes extremely interesting with mismatched card-hand-sizes and the number of sides of the shapes being built.  
 Such as any multiple of three works well with Tri-um (3,6,9,12,...) allowing for many triangles (1,2,3,4,...). However, with card-hand-size which are not multiples of three (4,5,7,8,10,11,...) there will be remaining cards (1,2,1,2,1,2,...); assuming that the Player is able to make the maximum number of triangles for that game. Thus those cards could be used to lessen the Player's score. This focuses the game on getting a higher score based on color.

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With Omnis-um there is a similar effect. As an example if each Player has a 8-card-hand, this allows for:

- 1 triangle, five cards left
- 2 triangles, two cards left
- 1 square and 1 triangle, 1 card left
- 2 squares, no cards left
- 1 pentagon and 1 triangle, no cards left
- 1 pentagon, three cards left
- 1 hexagon, two cards left
- 1 septagon, one cards left
- 1 octagon, no cards left

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Omnis-um plays extremely well with this optional rule.

**Card Count**

Red Top to Left 60°  
 Red Top to Right 60°  
 Red Left to Bottom 60°  
 Red Right to Bottom 60°  
 Red Left 90°  
 Red Right 90°  
 Red Top 180°  
 Red Bottom 180°

Orange Top to Left 60°  
 Orange Top to Right 60°  
 Orange Left to Bottom 60°  
 Orange Right to Bottom 60°  
 Orange Left 90°  
 Orange Right 90°  
 Orange Top 180°  
 Orange Bottom 180°

Yellow Top to Left 60°  
 Yellow Top to Right 60°  
 Yellow Left to Bottom 60°  
 Yellow Right to Bottom 60°  
 Yellow Left 90°  
 Yellow Right 90°  
 Yellow Top 180°  
 Yellow Bottom 180°

Green Top to Left 60°  
 Green Top to Right 60°  
 Green Left to Bottom 60°  
 Green Right to Bottom 60°  
 Green Left 90°  
 Green Right 90°  
 Green Top 180°  
 Green Bottom 180°

Blue Top to Left 60°  
 Blue Top to Right 60°  
 Blue Left to Bottom 60°  
 Blue Right to Bottom 60°  
 Blue Left 90°  
 Blue Right 90°  
 Blue Top 180°  
 Blue Bottom 180°

Purple Top to Left 60°  
 Purple Top to Right 60°  
 Purple Left to Bottom 60°  
 Purple Right to Bottom 60°  
 Purple Left 90°  
 Purple Right 90°  
 Purple Top 180°  
 Purple Bottom 180°

Black Top to Left 60°  
 Black Top to Right 60°  
 Black Left to Bottom 60°  
 Black Right to Bottom 60°  
 Black Left 90°  
 Black Right 90°  
 Black Top 180°  
 Black Bottom 180°

Grey Top to Left 60°  
 Grey Top to Right 60°  
 Grey Left to Bottom 60°  
 Grey Right to Bottom 60°  
 Grey Left 90°  
 Grey Right 90°  
 Grey Top 180°  
 Grey Bottom 180°

White Top to Left 60°  
 White Top to Right 60°  
 White Left to Bottom 60°  
 White Right to Bottom 60°  
 White Left 90°  
 White Right 90°  
 White Top 180°  
 White Bottom 180°  
 4 Color Wheel Cards  
 4 Scoring Cards

Total 72 (8 line positions in each of the 9 colors + 4 Color Wheel Cards + 4 Scoring Cards)

**Expansion and Reduction**

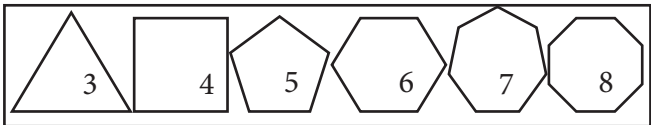
Another game option is Expansion and Reduction.

In this game the first hand each player is dealt 3 cards and attempts to make a triangle. The second hand each player is dealt 4 cards and attempts to make a quadrilateral. This continues until the sixth hand, in which each player is dealt 8 cards and attempts to make an octagon.

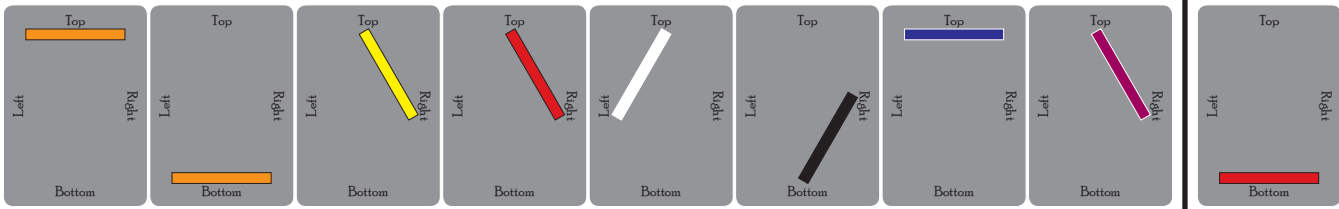
Then on the seventh hand each player is dealt 7 cards and attempts to make a septagon (or heptagon). The eighth hand each player is dealt 6 cards and attempts to make a hexagon. This continues until the eleventh hand, in which each player is dealt 3 cards and attempts to make a triangle.

Each hand the first player collects points based on: (1 + Concave Bonus) x Color Bonus = Points  
 As per normal once the first player to laydown the shape and discard, the other players are allowed one turn to finish and laydown a shape.

Hand	Cards Dealt	Shape Required
1	3	Triangle
2	4	Quadrilateral
3	5	Pentagon
4	6	Hexagon
5	7	Septagon (or Heptagon)
6	8	Octagon
7	7	Septagon (or Heptagon)
8	6	Hexagon
9	5	Pentagon
10	4	Quadrilateral
11	3	Triangle



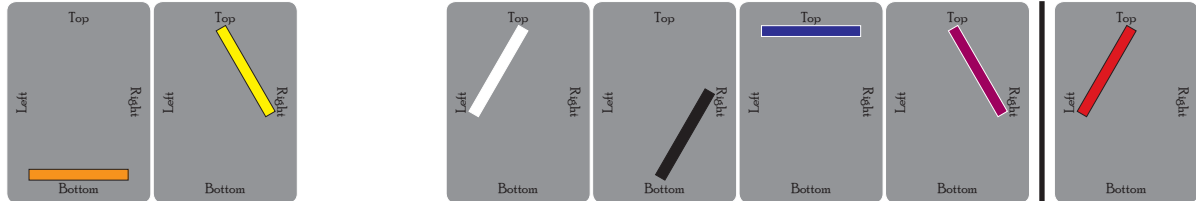
# Game of Omnis-um in play



Hand as dealt

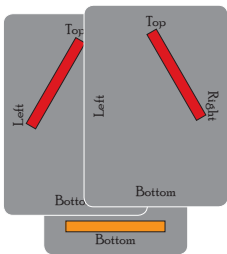
While the card showing could be useful, it is not as likely as the player already has a bottom orange, which could make a shape, so the player draws instead.

Card showing

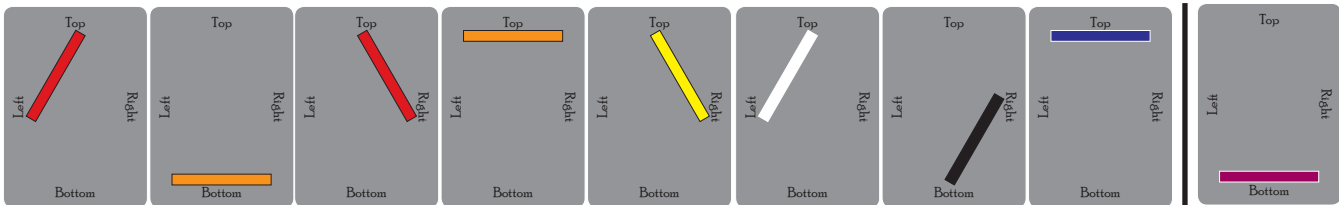


The drawn card allows the player to construct a triangle. The usefulness of any of the rest of the cards is entirely dependent on which cards are available or drawn. Thus the player, having more top right cards, discards the top right purple card.

Card drawn

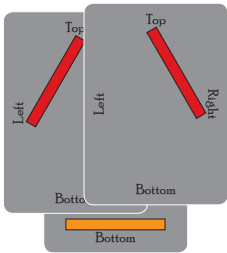


(Triangle (3 sides) + Not Concave (0)) x Adjacent Color Bonus(3) + Card Count (3) = Points  
 $(3 + 0) \times 3 + 3 = 3 \times 3 + 3 = 9 + 3 = 12$

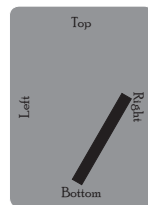


The other players are getting close to going out, so seeing how to make a shape out of the card the player decides to take the card.

Card showing



(Triangle (3 sides) + Not Concave (0)) x Adjacent Color Bonus (3) + Card Count (3) = Points  
 $(3 + 0) \times 3 + 3 = 3 \times 3 + 3 = 9 + 3 = 12$

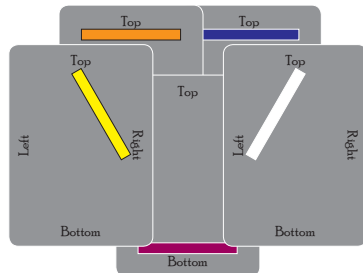


Card discarded.

Giving the player a total of 20 points, plus being the first player out.

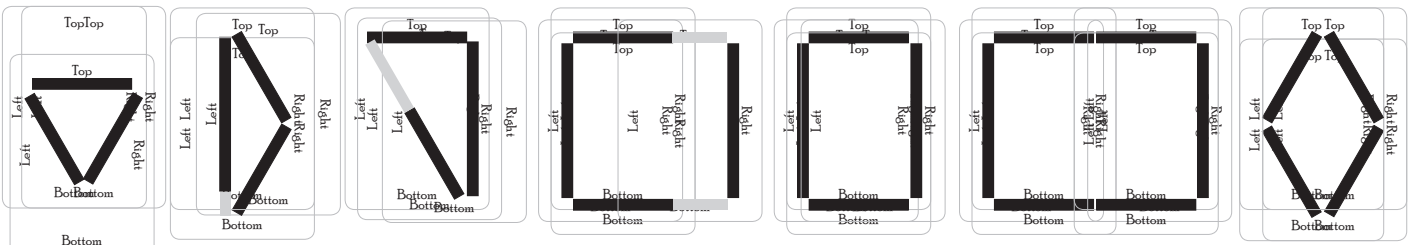
This forces the other players to finish their shapes and possibly losing points due to unplayable cards.

**Total**  
 $12 + 8 = 20$



(Trapezoid (4 sides) + Not Concave (0)) x No Color Bonus (1) + Card Count (5) = Points  
 $(3 + 0) \times 1 + 5 = 3 \times 1 + 5 = 3 + 5 = 8$

### Some Possible Shapes



Equilateral Triangle

Isosceles Triangle

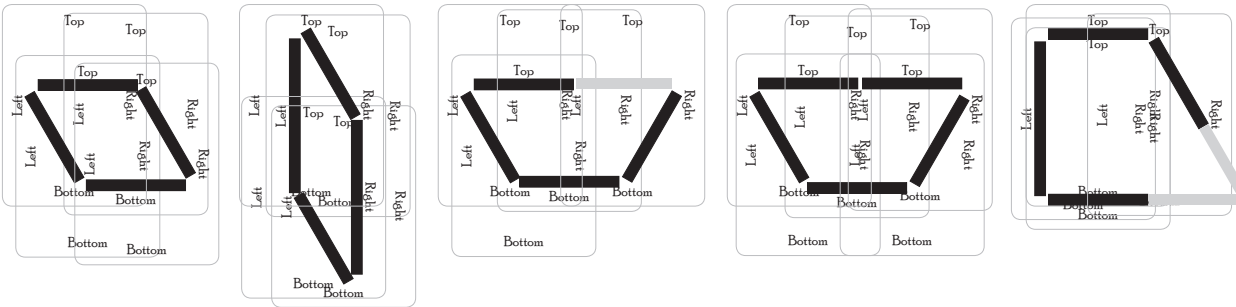
Right Triangle

Square

Rectangle

Rectangle

Rhombus



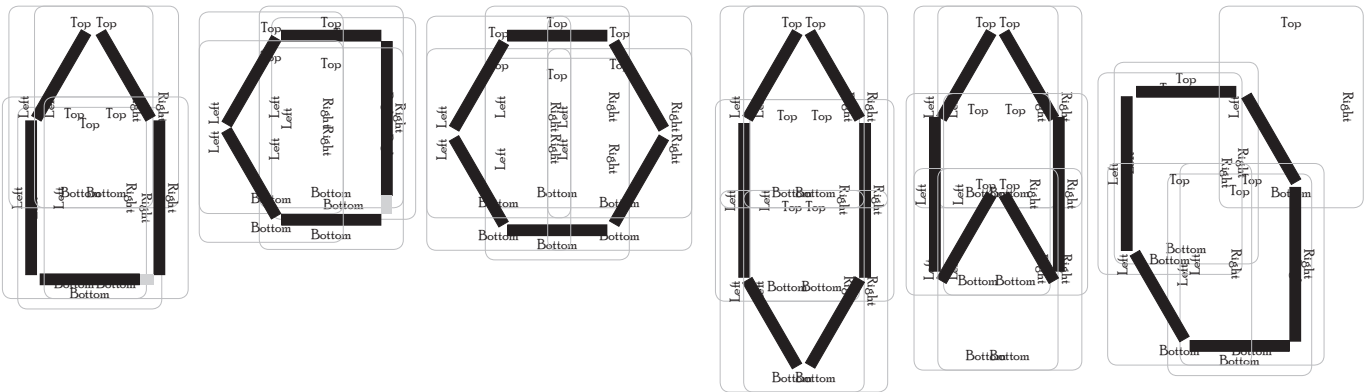
Parallelogram

Parallelogram

Isosceles Trapezoid

Isosceles Trapezoid

Scalene Trapezoid



Isosceles Pentagon

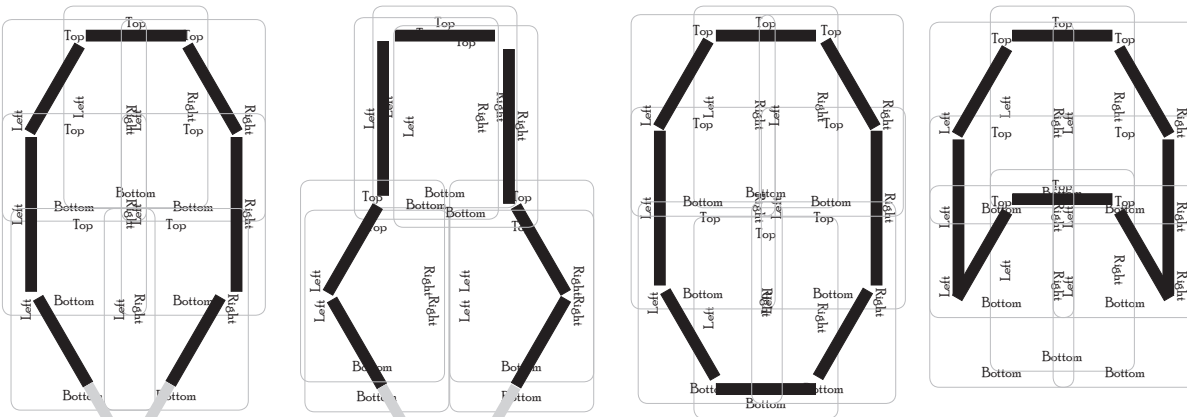
Isosceles Pentagon

Equilateral Hexagon

Isosceles Hexagon

Concave Isosceles Hexagon

Hexagon



Septagon (Heptagon)

Concave Septagon (Heptagon)

Octagon

Concave Octagon

As shown the angle of the lines can not change. However, the length of the line can be assumed to be longer than shown. The grey shows the assumption of an extended line.