

DRAWING REGULAR HEPTAGON (7) AND REGULAR NONAGON (9) BY ORIGAMI (PAPER FOLDING)

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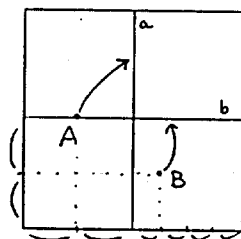
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Regular heptagon and regular nonagon are good examples to show the ability of paper folding, since both can not be made by Euclidean (using ruler and compass). For the convenience starting with a square diagram the concentric polygon are here demonstrated. As you see this does not disturb the generality. Here is described only how to make them. Why and the other possible ways are left to you as a quiz.

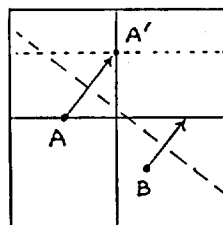
Heptagon.

1) Make two medians, vertical a and horizontal b . Get two points A and B of coordinates $(1/4, 1/2)$ and $(5/8, 1/4)$ respectively, considering rectangular system with $(0, 0)$ at lower left corner and $(1, 1)$ at upper right corner. Now FOLD such that point A comes onto line a exactly and point B comes onto line b exactly at the same time.

Folds

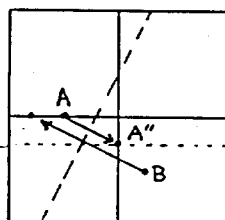


Realization I

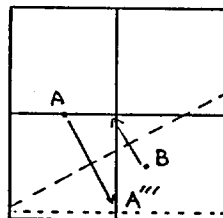


2) The realisation is not unique but you will obtain three. The three displace position of A on line a , say A' , A'' and A''' correspond to shoulder height, hip height and foot ground respectively.

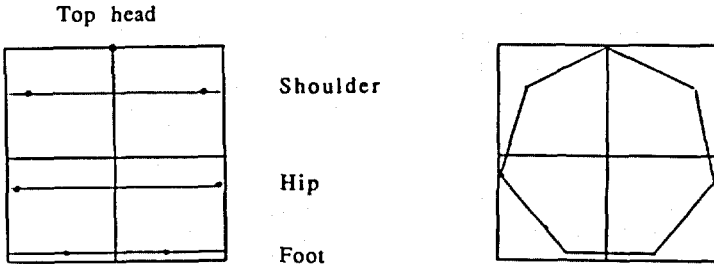
Realization II



Realization III



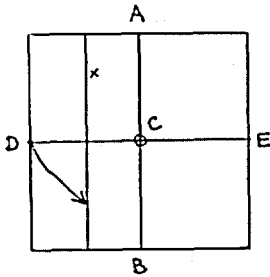
3) Considering the upper most position of line a in the square or $(1/2, 1)$ is the head top and the center or $(1/2, 1/2)$ is the center of heptagon, the completion is easily made.



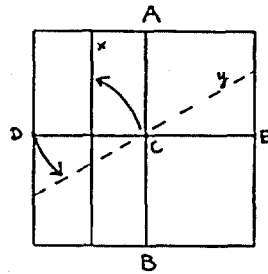
Nonagon

1) Make two medians and call AB (vertical), DE (horizontal) and their crossing (center C). Fold moving point D onto C and call the crease, line x. Fold making point C a pivot and moving point D onto crease x. Call the new crease, line y.

Fold 1



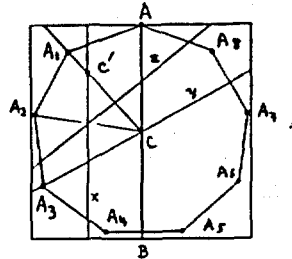
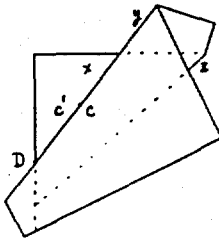
Fold 2



2) Fold moving point C onto line x and point D onto line y at the same time and call the crease line z.

Fold 3

Get the wanted apexes



3) Call the new position of point C on line x, point C' and call the crossing of line x and line z, point F. Make a line through C and C' and an other through C and F. On these lines and line y make points A₁, A₂ and A₃ equal amount of |CA| from the center C. Fold along line y obtain A₄, A₅ and A₆ at new positions of A₂, A₁ and A. By the reflection at AB, obtain A₇ and A₈. A, A₁, A₂, A₃, A₄, A₅, A₆, A₇ and A₈ are apexes of the wanted regular nonagon.