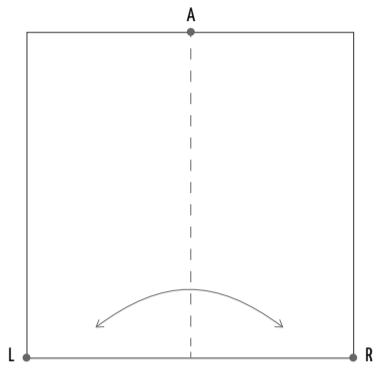


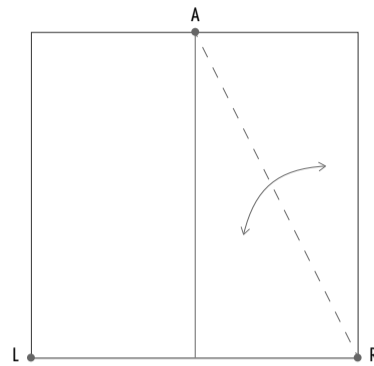
One-fold Origami Construction of Robert Geretschläger's Easy Pentagon

Dmitri Nedrenco

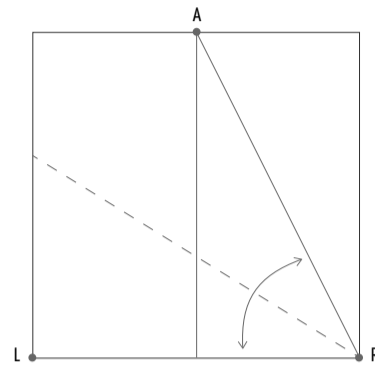
June 9, 2015



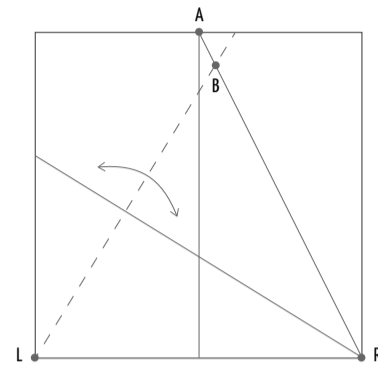
i Fold perpendicular bisector of the lower side LR of the square, thus creating the midpoint A of the upper side. *HJA2*



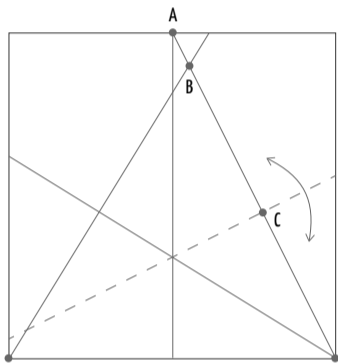
ii Fold the line AR . *HJA1*



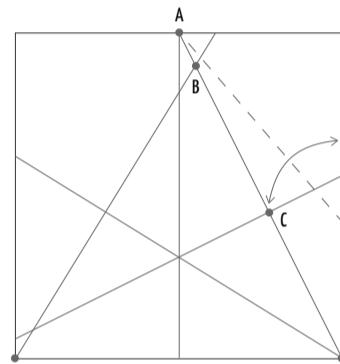
iii Fold AR on the LR , creating angle bisector of the two lines. *HJA3*



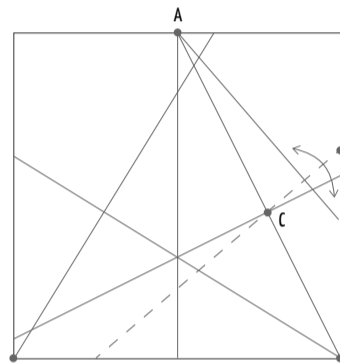
iv Fold the angle bisector from step **iii** onto itself through L , creating the point B . Note that BR has the length 1. *HJA4*



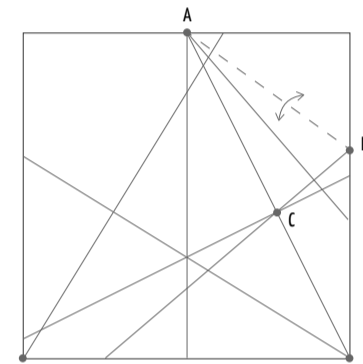
v Fold the perpendicular bisector of BR , creating the midpoint C . The length of AC is ϕ , where ϕ is the golden ratio, so $2\phi = \sqrt{5}-1$. *HJA2*



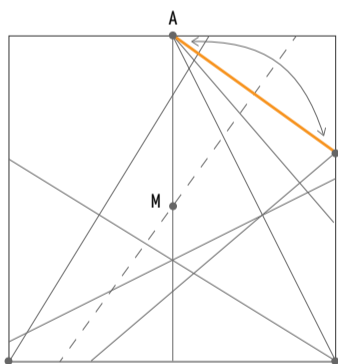
vi Fold C onto the right side of the square such that the fold line passes through the point A . We want to transport C on the right side of the square. *HJA5*



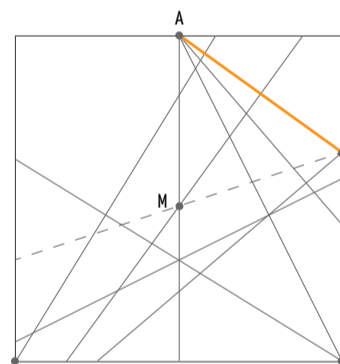
vii Fold now the line from the previous step onto itself through C . The point D is the intersection of the fold line and the right side of the square. *HJA4*



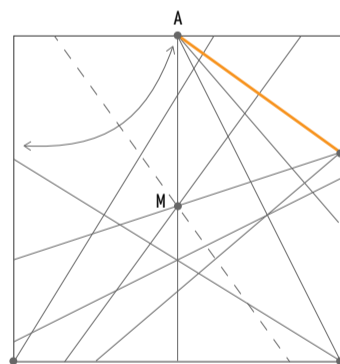
viii Fold AD . The length of AD is ϕ as it should be for a side of a our pentagon. *HJA1*



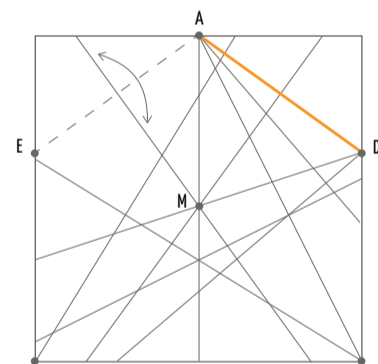
ix Fold the perpendicular bisector of AD creating the center M of the pentagon as this fold line and the line from step **i** are symmetry axes of the pentagon. *HJA1*



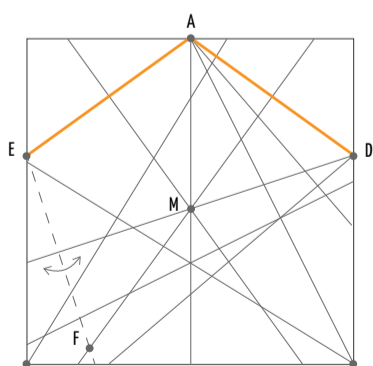
x Fold the line DM , it is a symmetry axes, too. *HJA2*



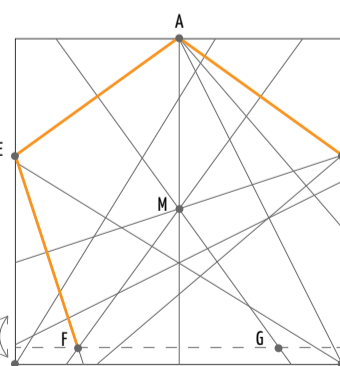
xi It is difficult to transport AD directly, so we use various symmetries to construct the other sides of the pentagon. Fold A onto the left side through M . *HJA5*



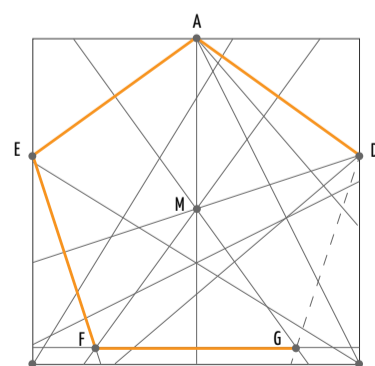
xii Fold the fold line from the previous step onto itself through A to produce E , i.e. the image point of A on the left side. By symmetry AE has the right length, ϕ . *HJA4*



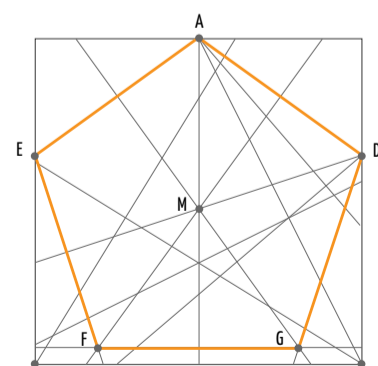
xiii Fold line DM onto itself through E to create F , the image point of E in the reflexion across DM . *HJA4*



xiv Fold left side onto itself through F producing G as intersection point of the fold line and one symmetry axes through M . *HJA4*



xv Join by folding the points D and G in order to get the fifth side of the regular pentagon. *HJA2*



xvi Now we have a regular pentagon $DAEFG$.