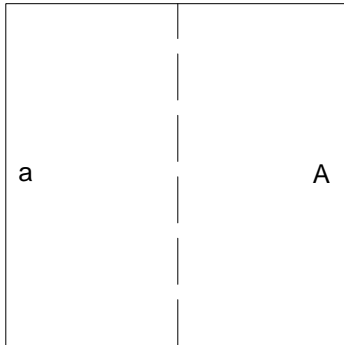


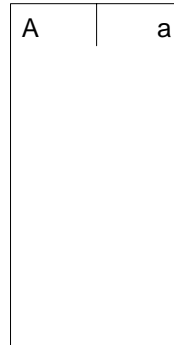
Folding a Regular Heptagon From a Square

method and diagrams by
James M. Clark

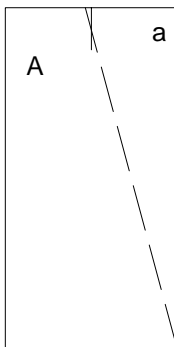
Constructing a seven-sided regular polygon seems a daunting task, but here is a method that is simple and accurate. A geometric approximation is used, but the error is less than a thousandth of an inch for a four-inch square, which inevitably will be less than the human error, or errors due to the thickness of the paper.



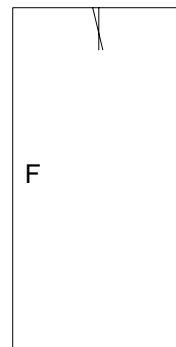
1. Valley-fold the square in half, folding edge **a** to edge **A**.



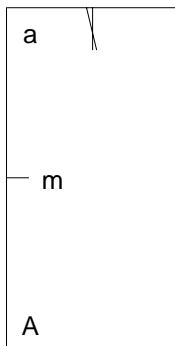
2. Crease the mid-point of the upper edge by folding corner **a** (top layer only) to corner **A**.



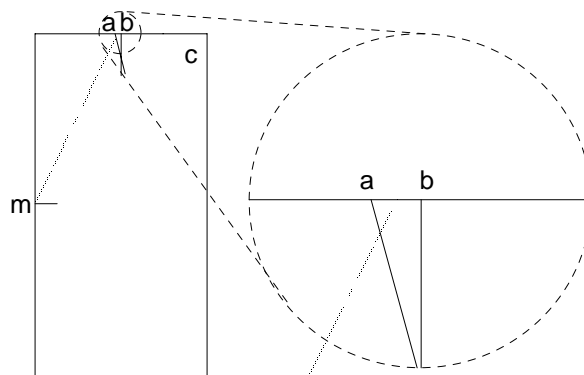
3. Make another landmark near the first one by folding corner **a** (top layer only) to edge **A**. Crease only at the top.



4. Turn the paper over, keeping the folded edge **F** on the left, then repeat steps 2 and 3.

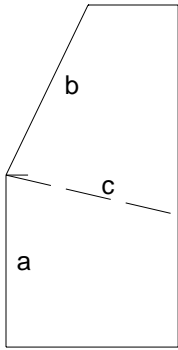


5. Crease the mid-point **m** of the left edge by folding corner **a** to corner **A**.

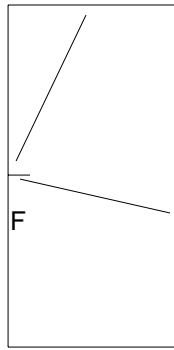


6. Mountain-fold from **m** to half-way between landmarks **a** and **b** (see detail view). Keep the two corners aligned at **c** while doing this.

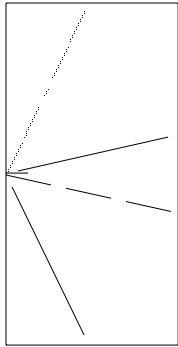
The distance between landmarks **a** and **b** is so small that a visual estimate of the half-way point between them will suffice. I make a pencil-mark, because this will be cut away later.



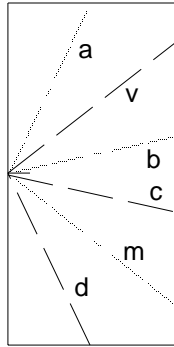
7. Valley-fold, bringing edge **a** over edge **b**. Take care that the fold starts at the mid-point. Then unfold folds at **b** and **c**.



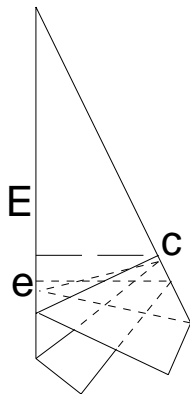
8. Turn the paper over, keeping the folded edge **F** on the left.



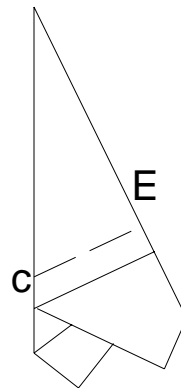
9. Repeat steps 6 and 7 to make these folds.



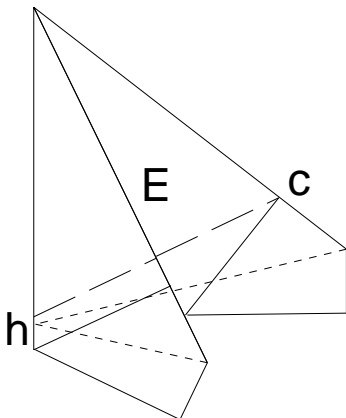
10. Re-form mountain folds **a** and **b**, bringing these together to make the new valley fold **v**. Re-form valley folds **c** and **d**, bringing these together to make the new mountain fold **m**.



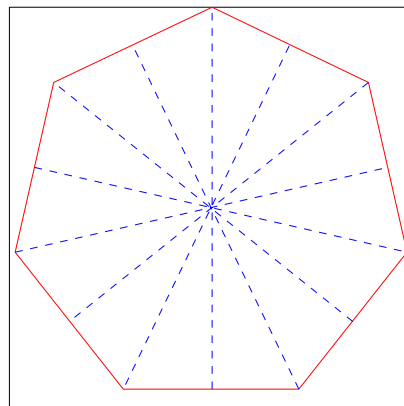
11. Dotted lines show hidden edges. *Using a paper cutter*, cut at a right angle to edge **e-E** through front corner **c**. Or, *to use scissors*, valley-fold upper layers from front corner **c** and at a right angle to edge **e-E**, by aligning **e** over **E**. Unfold and turn over.



12. (*For using scissors*) Find corner **c** (behind) and valley-fold upper layers from back corner **c** and at a right angle to edge **E**, and parallel to a nearby edge. Unfold at **E**, bringing half of the layers to the right.



13. The front and back creases should form a straight line like this. Note that the hidden corner at **h** (see dotted lines) is NOT at the end of the crease. Cut along the crease through all layers.



The finished heptagon nearly fills the square and has these creases.