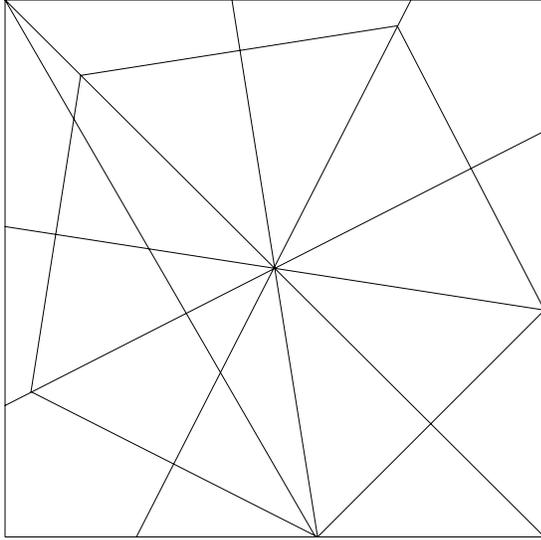


## Folding a Regular Pentagon from a Square



### Overview

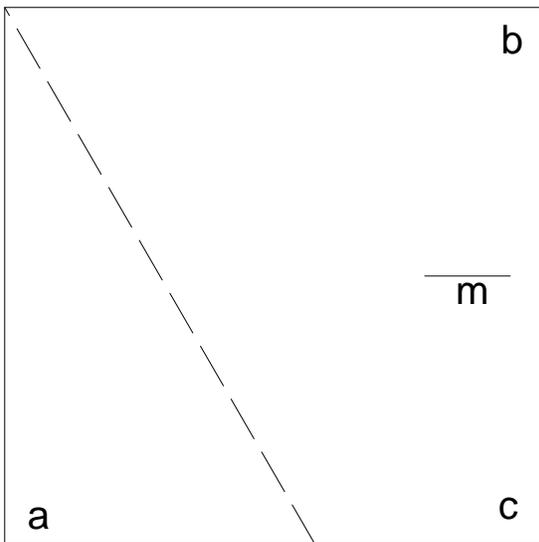
This method creates the largest regular pentagon centered on the center of the square.

First, a 30 degree angle is folded, from the upper-left corner of the square to the point that will be the bottom corner of the pentagon.

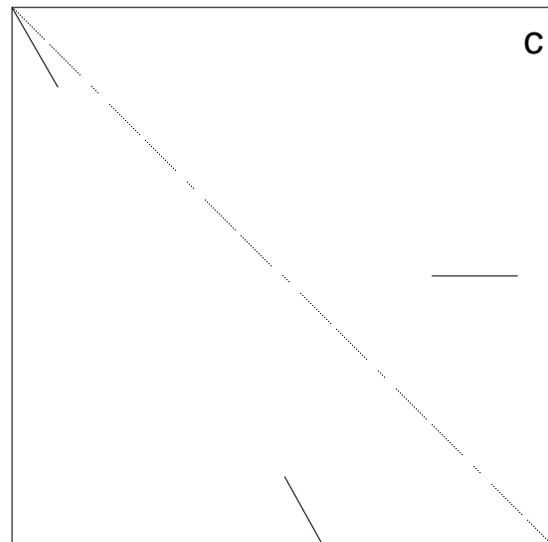
If the side of the square has length 1, then the landmark on the bottom edge is  $\tan(30\text{-deg}) = 0.57735$  from the bottom left corner.

But the correct position is  $0.5 + 0.5 \cdot \tan(9\text{-deg}) = 0.57919$  which is just  $0.57919 - 0.57735 = 0.00184$  more. For an 11-inch square, the error is less than one 50th of an inch, hardly noticeable.

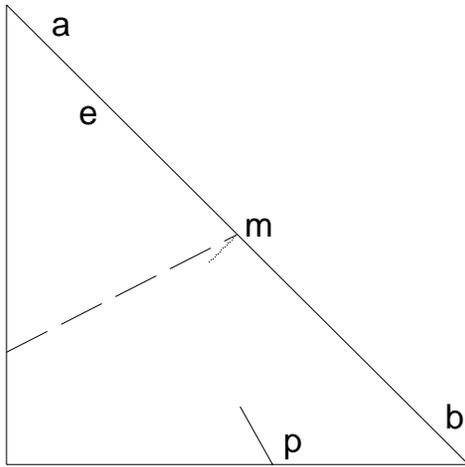
### Instructions



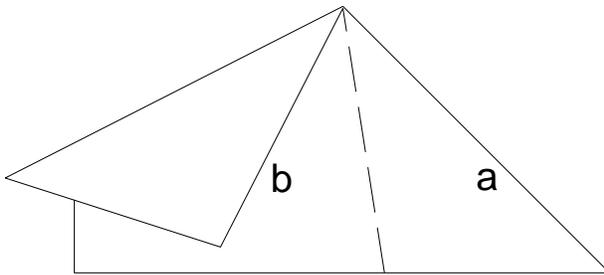
1. Crease the midpoint **m** of the right edge of the square by folding corner **b** to corner **c**. Then fold the 30-degree angle shown by bringing corner **a** to crease **m**. Crease only the two ends of this fold.



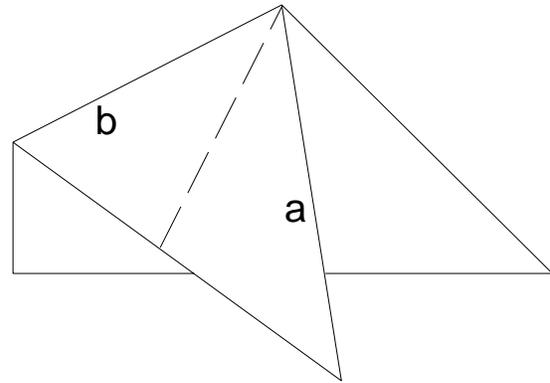
2. Mountain-fold the diagonal as shown, bringing corner **c** behind.



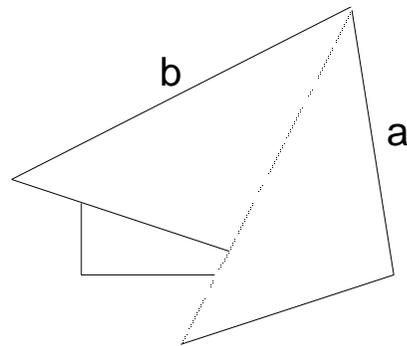
3. First, crease the midpoint **m** of the diagonal by bringing corner **a** to corner **b**. Then valleyfold at midpoint **m**, bringing edge **e** across landmark **p** on the bottom edge. (Or a *very tiny* bit further to the right.)



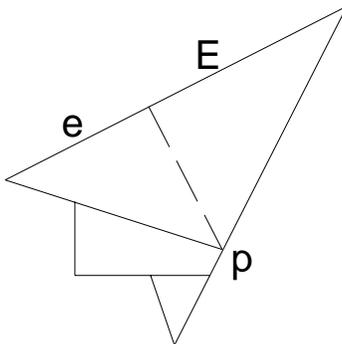
5. Valley-fold, bringing edge **a** to edge **b**. This halves the angle.



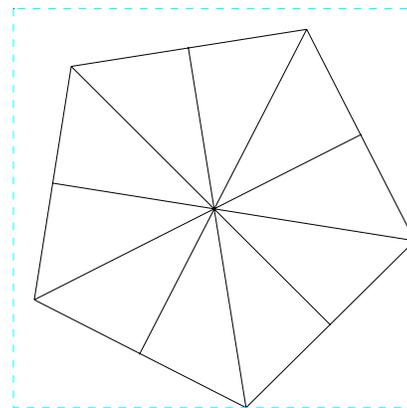
4. Valley-fold, bringing edge **a** to edge **b**. This halves the angle.



6. Mountain-fold where the edges meet in the middle, bringing edge **a** behind edge **b**, where they should meet exactly.



7. Valley-fold the upper two layers at corner **p**, bring edge **e** to edge **E**. Then unfold and cut along the new crease through all layers with scissors or paper-cutter.



8. Unfold completely. All the center-lines of the pentagon are created.