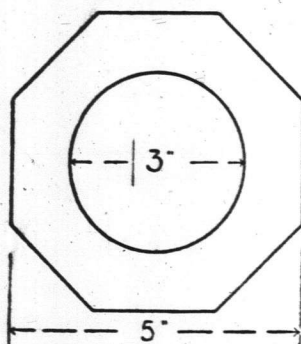


it to the cardboard back. When that is sufficiently "set," put a tiny dab of paste on the corner of one of the centre pieces and fold it, over a black-lead pencil, down against the face of the model. Repeat with the other three, punch a hole in one corner for hanging up, and the model is complete.

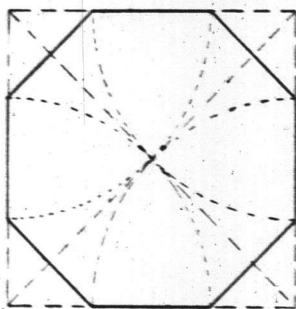
EXERCISE 25.—An octagonal table mat. This exercise is a good introduction to another simple

Ex 25. An Octagonal Mat

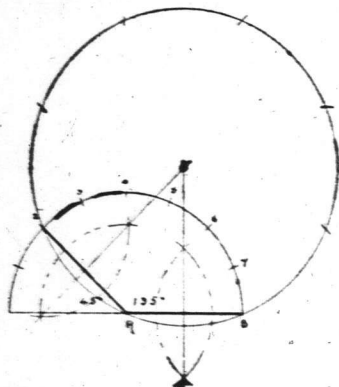


polygon, the octagon. There are several methods of constructing the figure, but perhaps the best is that of the circumscribing square. Draw a square of the required size, and its diagonals. With the compasses on the angle of the square and radius equal to the semi-diagonal, describe an arc. Repeat from each angle and the points of the octagon are obtained. The diagram makes this clear, though probably this simple method is known to most teachers.

1st Method of making octagon



An easy method of drawing any polygon

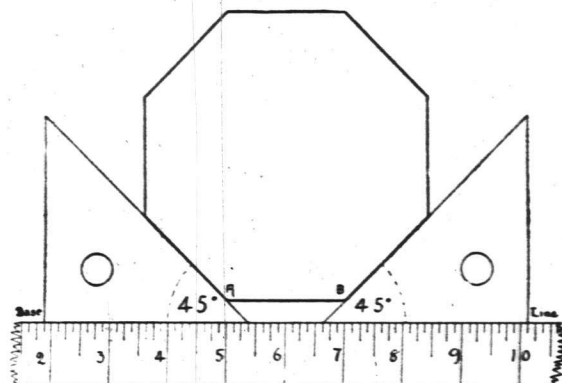


Another method is to draw a circle and vertical and horizontal lines through its centre. The resulting right angles can then be bisected and the circle divided into eight equal parts. By joining these points an octagon is of course easily obtained.

If, however, the children have grasped the previous lessons, one edge of the octagon can be given and the 45° set square used in the same manner as the 60° set square was used to draw the hexagon.

One other method for describing an octagon is given. It is useful, as the principle can be applied to any polygon. Commence by drawing one

Method of
Drawing an Octagon with set square.



side of the polygon and produce it in one direction. From one end of the given side as centre, and the length of the side as radius, describe a semicircle. Divide this semicircle into the same number of parts as the figure is to have sides. Then a line drawn through the *second* division of the semicircle gives the exterior and interior angle of the required polygon. The figure may be completed by copying the angle thus found at the other end of the given side, or the two sides may be bisected, and the intersection of the bisecting lines will circumscribe the polygon. The length of side can then be stepped off on this circle and the figure drawn.

The practical work of this model is very simple, but may be varied by cutting out a circle, or a smaller octagon, of white paper and pasting it on the large octagon as a centre piece.

EXERCISE 26.—A letter case or pocket, to hang up. Two forms of this are given, and either may be taken. The curves at the top are portions of circles, but it may be worth while to try some free-hand curves in some cases. The alternative pattern is fastened by a slip of card instead of being tied with ribbon: but this could, of course, be applied to either.

Commence the drawing by a rectangle $8\frac{1}{2} \times 6$. Measure down from the top $1\frac{1}{4}$ and $2\frac{1}{2}$, and draw faint lines across. On these lines the centres of the arcs used to form the ornamental tops are