Framing a Polygon Roof

The term polygon simply means an enclosed figure. A regular polygon means an enclosed figure with all the sides of equal length.

This book gives rafter tables for five different regular polygons. Using these tables you can quickly find all the rafter lengths and angles needed to frame any polygon roof of any span from pitch 3/12 to 30/12.

Pentagon	5	sides
Hexagon	6	sides
Octagon	8	sides
Decagon	10	sides
Dodecagon	12	sides

Using the table on page 209, we will figure the rafter lengths for the 10/12 Octagon roof shown in Figure 33.

The two most important dimensions on any polygon roof are:

1. The common rafter run.
2. The length of the sides.

Given one, we can quickly find the other by using the factors given at the top of each chart.
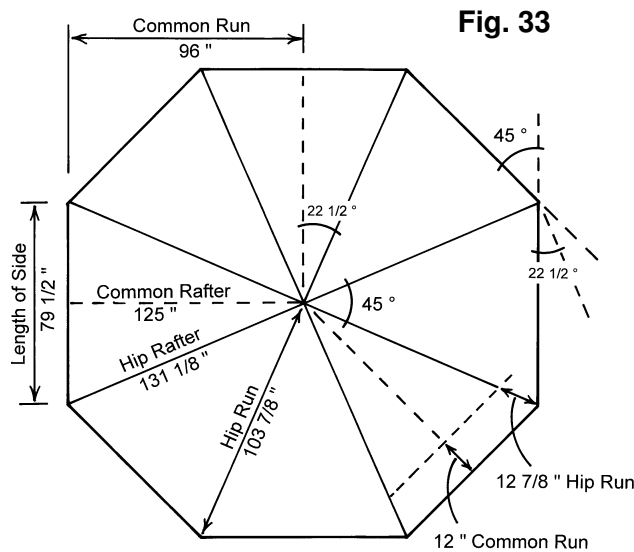
Fig. 33

Example:

Common Rafter Run x 0.828 = Length of side
(96") (Octagon) (79 1/2")

The Common Rafter Run is the figure needed to enter the rafter length tables.

To find the common rafter length, multiply the common rafter run by the RL (Rafter Length) factor given for a 10/12 pitch.

Common Run x 1.302 = Common Rafter Length
(96") (125")

To find the hip rafter length, multiply the Common Rafter Run by the Hip Length Factor that is given for a 10/12 pitch.

Common Run x 1.366 = Hip Rafter Length
(96") (131 1/8")

To find the Hip Rafter Run (needed when the ceiling joists run on the angle of the hip rafter), use the factor given at the bottom of the chart.

Common Run x 1.082 = Run of Hip Rafter
(96") (103 7/8")

The sheathing cuts for each pitch are given in the right side of the chart. Use as shown in Figure 17 on page 22.

The pitch of the hip rafter on an Octagon roof is always:

Roof Pitch / 12 7/8"

For this 10/12 octagon roof the hip pitch on the framing square would be 10 / 12 7/8".

Working Angle:
A full circle has 360º. To find the angle of each point of a polygon, divide 360º by the number of sides.

360º ÷ 8 = 45º

The working angle is one half of 45º or 22 1/2º. This is the angle used for cutting the ends of the rafters.