DEVELOPMENT of HIP ROOF ANGLES

All triangles are right triangles. The Plan (green) and Common Pitch (yellow) triangles are drawn first. Next the Hip Pitch (pale blue) and Angle between the Eave and Hip Ridge (blue) triangles are developed. The triangle for the Backing Angle (no color) is developed last. Lines marked equal are connected using a compass.
DEVELOPMENT of PURLIN ANGLES

All triangles are right triangles. The **Backing Angle** (green) and **Angle between Eave and Hip Ridge** (yellow) triangles are transferred from the previous development. Note the orientation of the angles relative to one another. Next the **Miter Angle on side face of Hip Rafter** (pale blue) and **Miter Angle on face of Purlin perpendicular to the Roof Plane** (blue) triangles are developed. The triangle for the **Saw Bevel Angle on face of Purlin perpendicular to the Roof Plane** (no color) is developed last. Lines marked equal are connected using a compass.
Development of C5, P1, C1, P2, and R2 Angles

The projection of the face of the Purlin perpendicular to the roof plane (the face of Miter = 90 – P1) to the side face of the Hip/Valley forms angle 90 – R2 with respect to a line parallel to the long axis of the Hip/Valley.

Development of Purlin Angles

Supplementary Reading:
DEVELOPMENTS: Developments of angles SS, DD, R1, P2 and C5
COGNATE KERNELS: Hierarchy Of Developed Kernels: Page 1
Purlin face set in the roof plane:
Miter (Angle on the stick) = 90 – P2, Saw Blade Angle = C5
Begin with angles C5 and P2 arranged as per the sketch above
Develop angles R2, P1 and C1 as per the diagram
MISCELLANEOUS NOTES: Cutting Compound Angles: Page 4
Purlin face perpendicular to the roof plane:
Transfer the following angles: Miter = 90 – P1, Bevel = 90 – P2
Develop Saw Blade Angle = C1 as per the diagram
Miter (Angle on the stick) = 90 – P1, Saw Blade Angle = C1