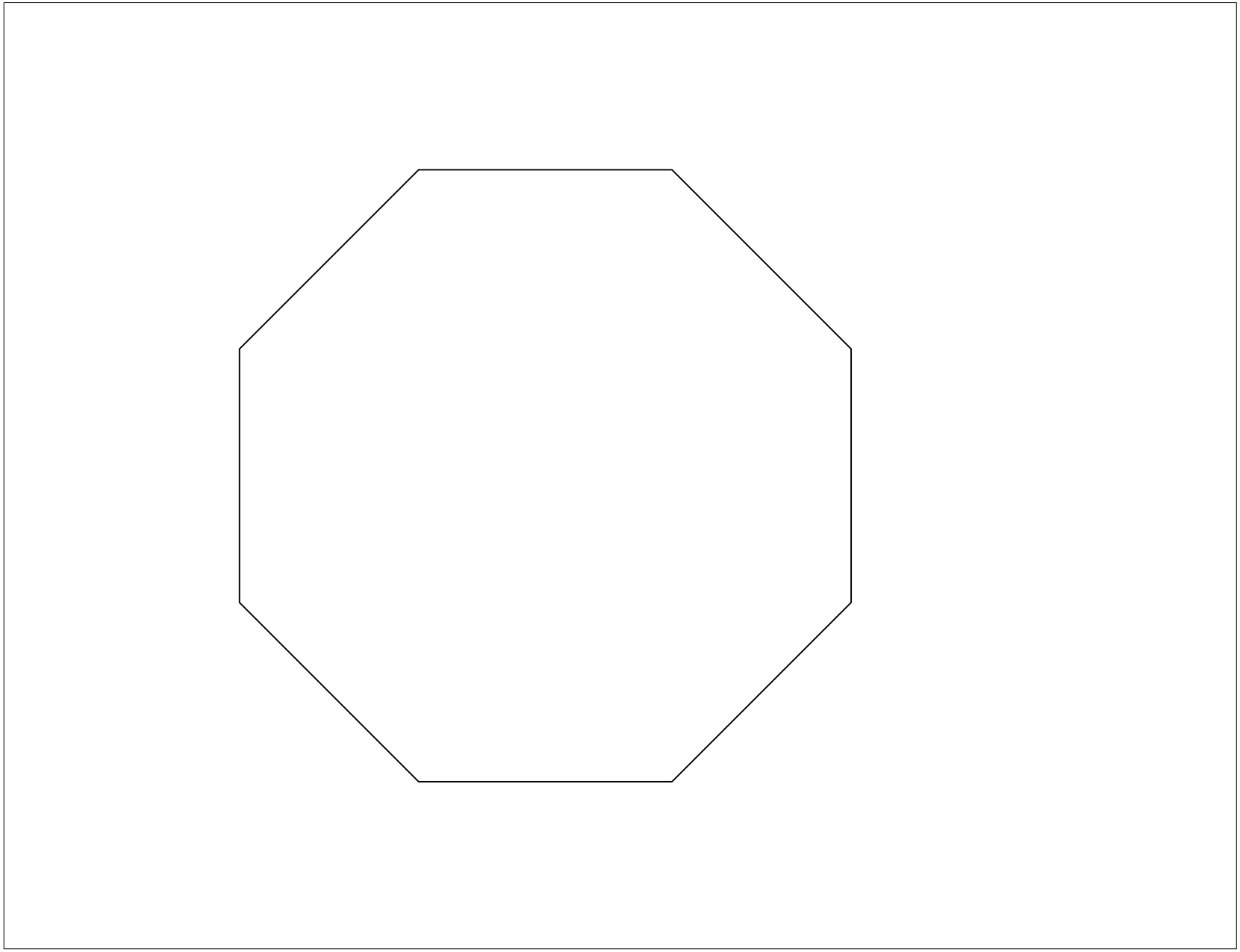
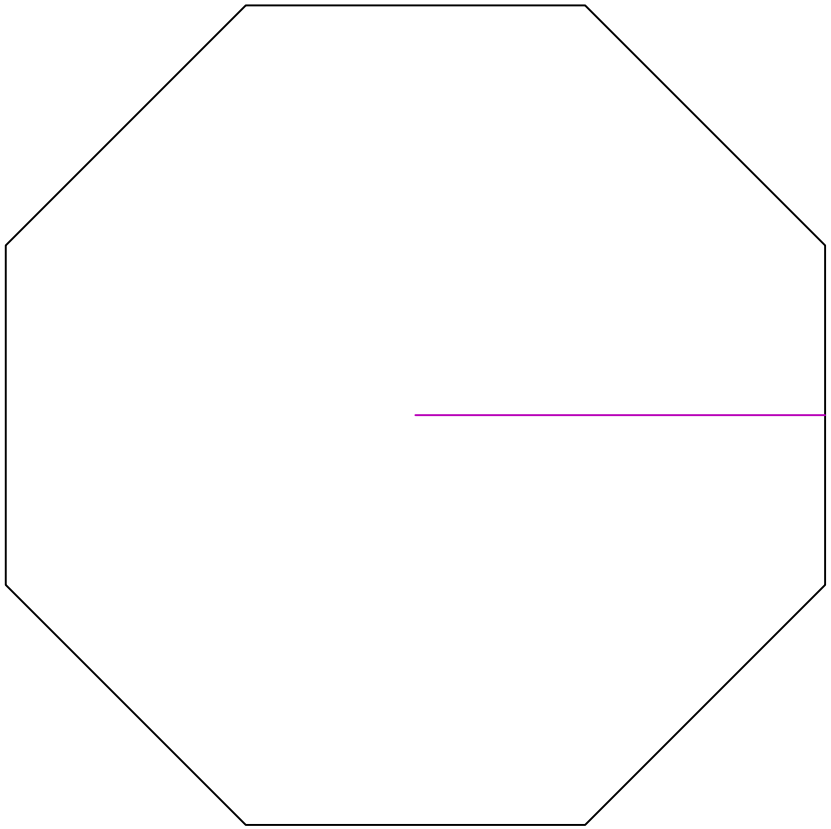
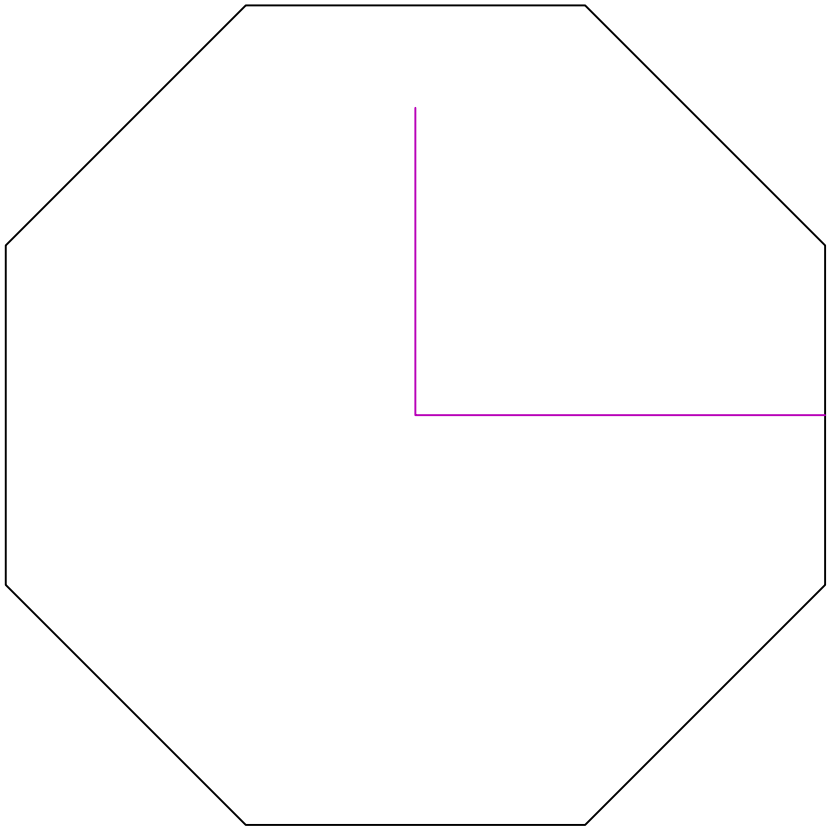


Plan view

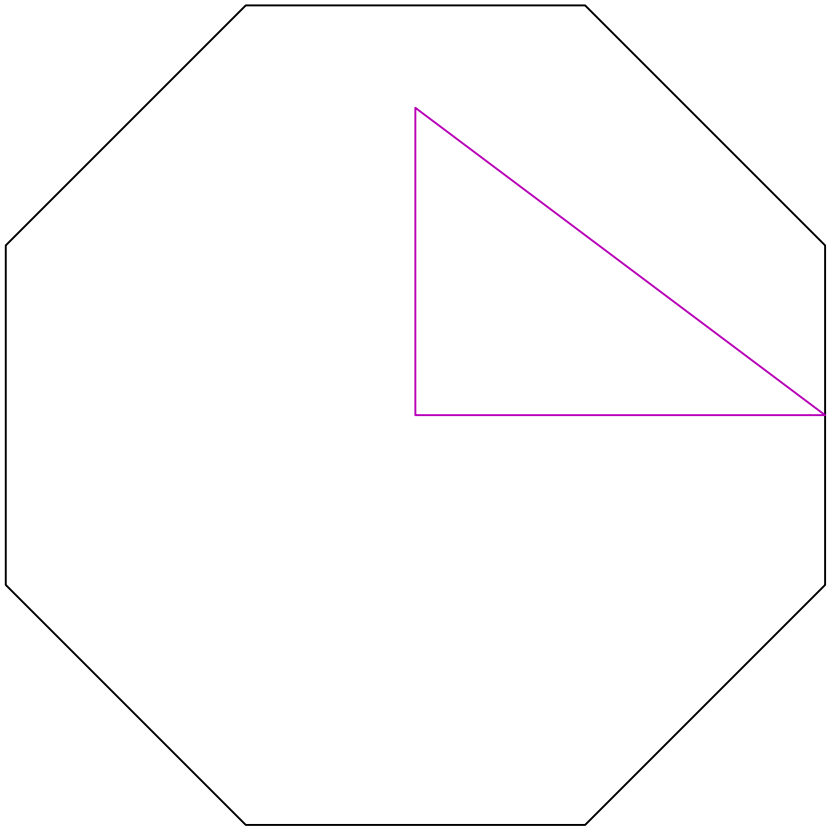
3/16"=1'



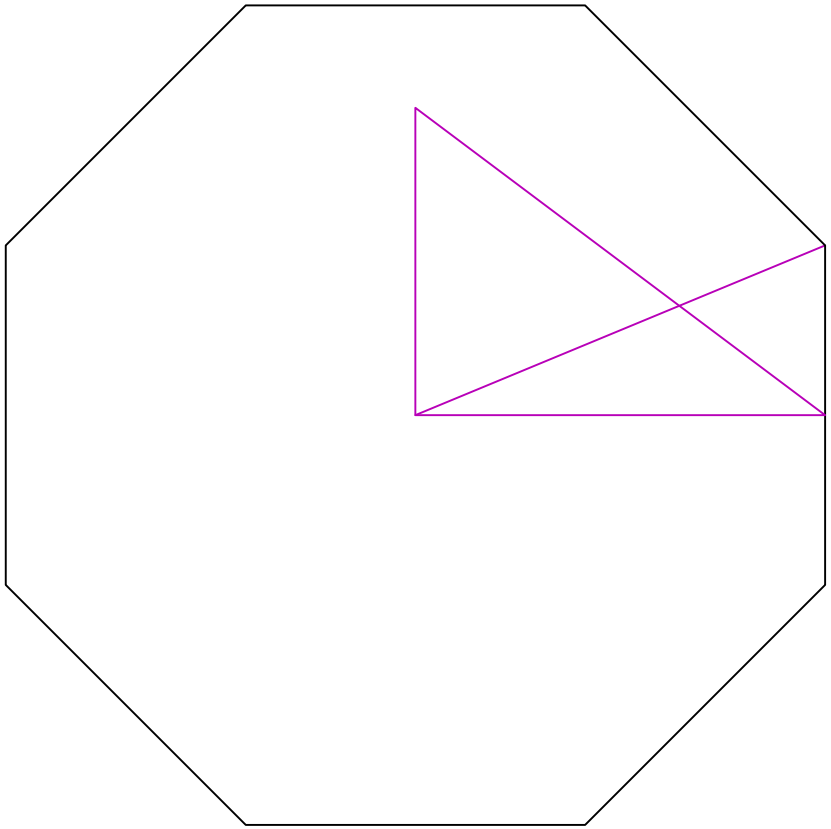
Common Rafter run



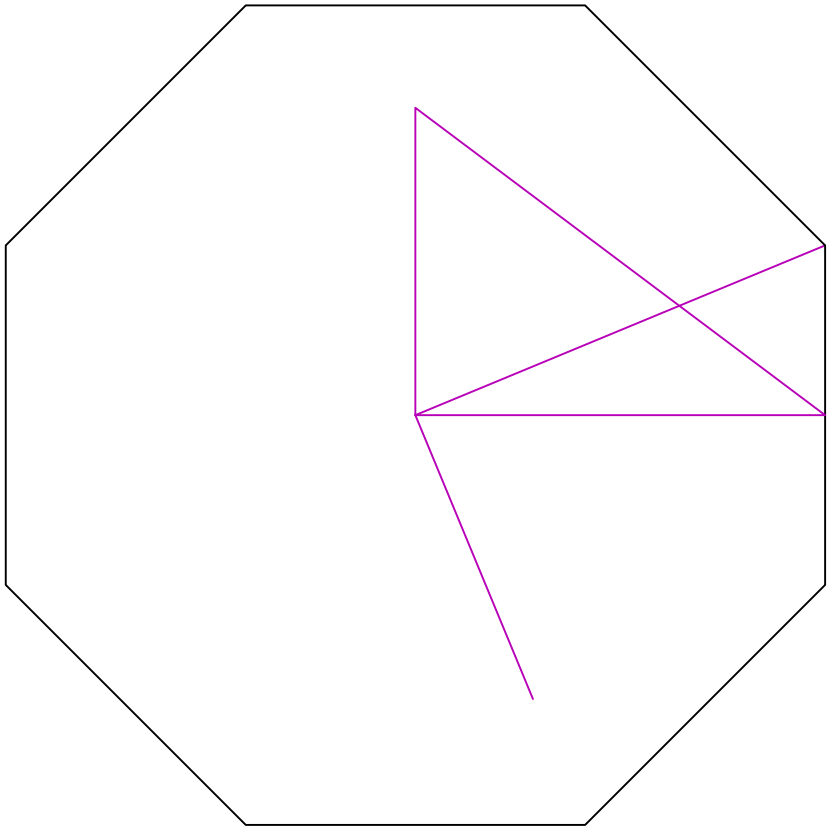
Common Rise



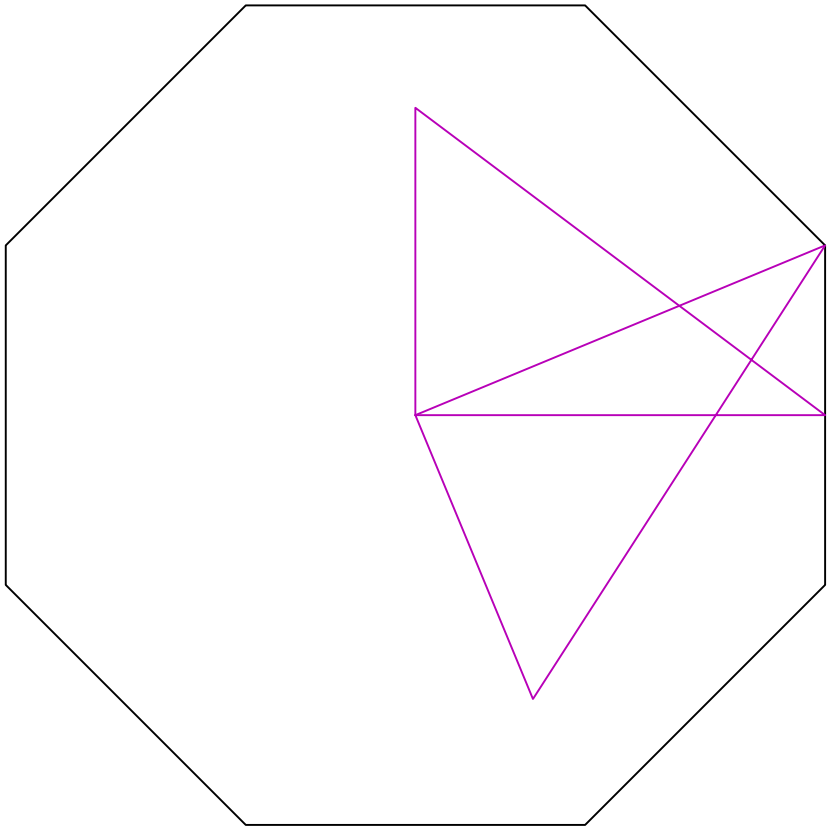
Common rafter length



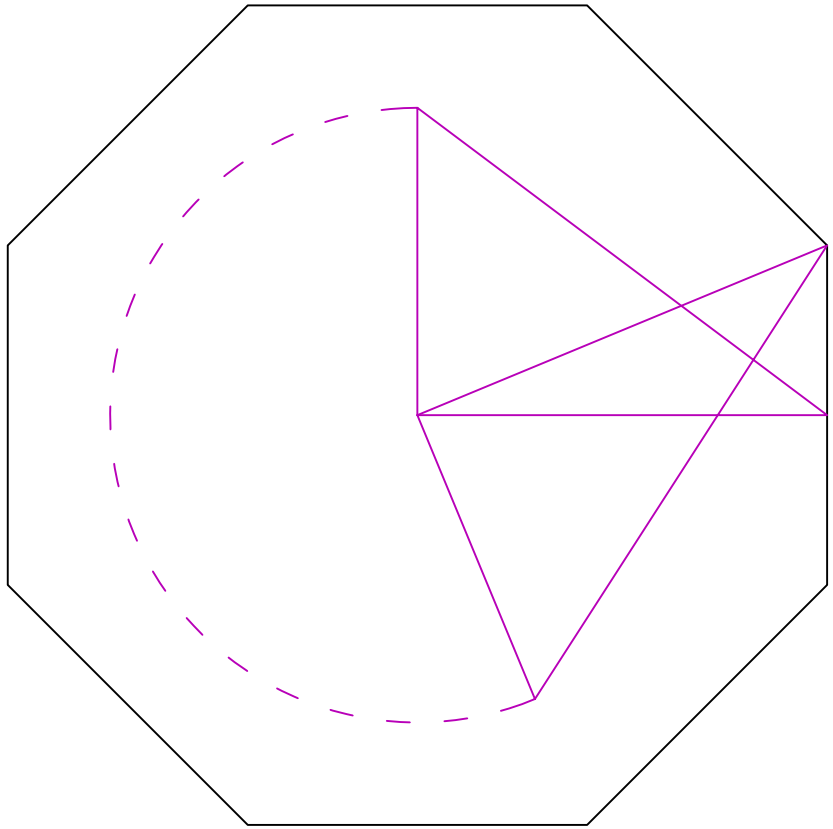
Hip Rafter Run



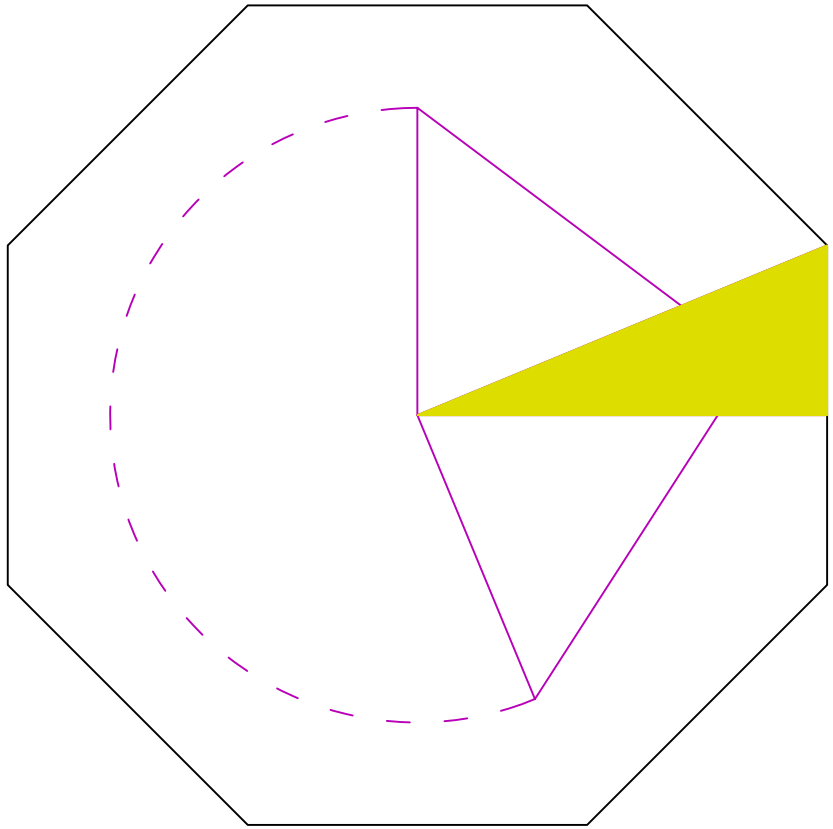
Hip Rafter Rise



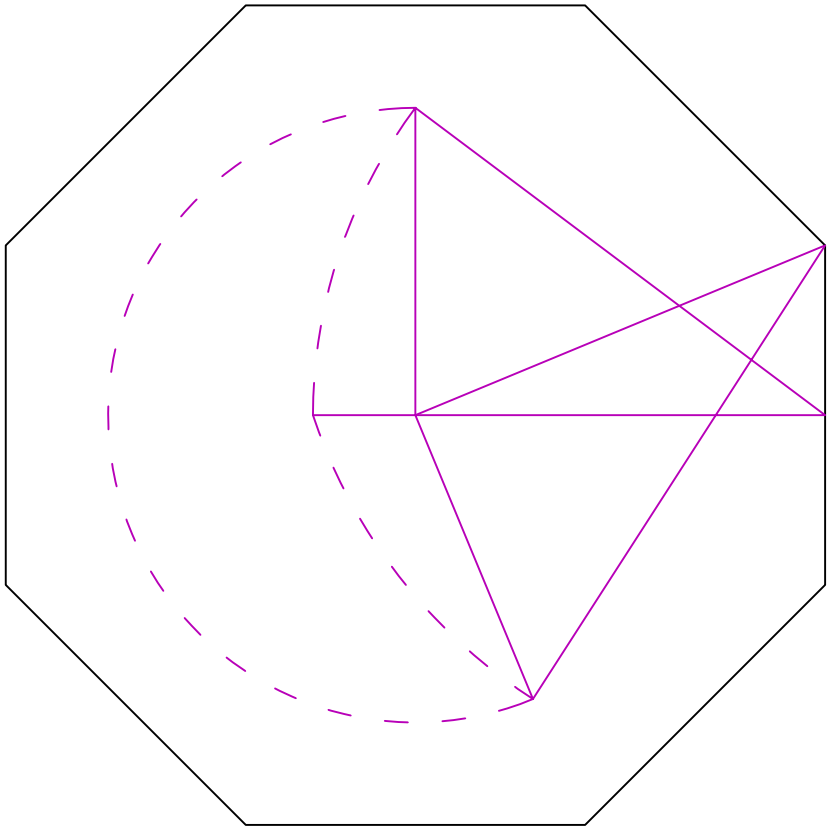
Hip Rafter Length



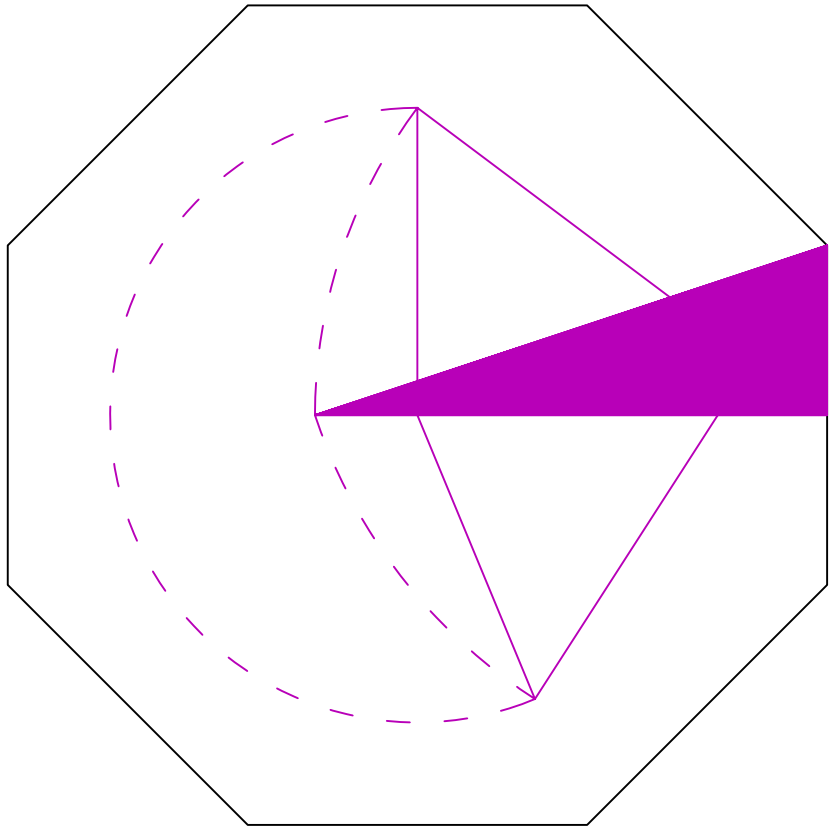
Hip and common rise are of equal length, the dashed line confirms this.



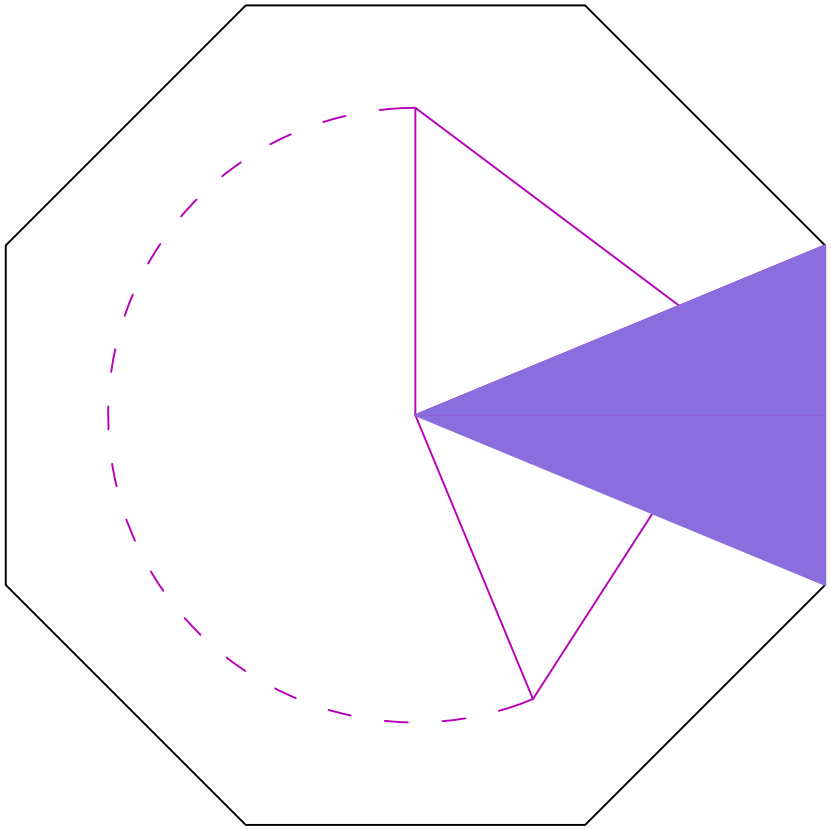
This is the side cut of the jack rafter in plan view



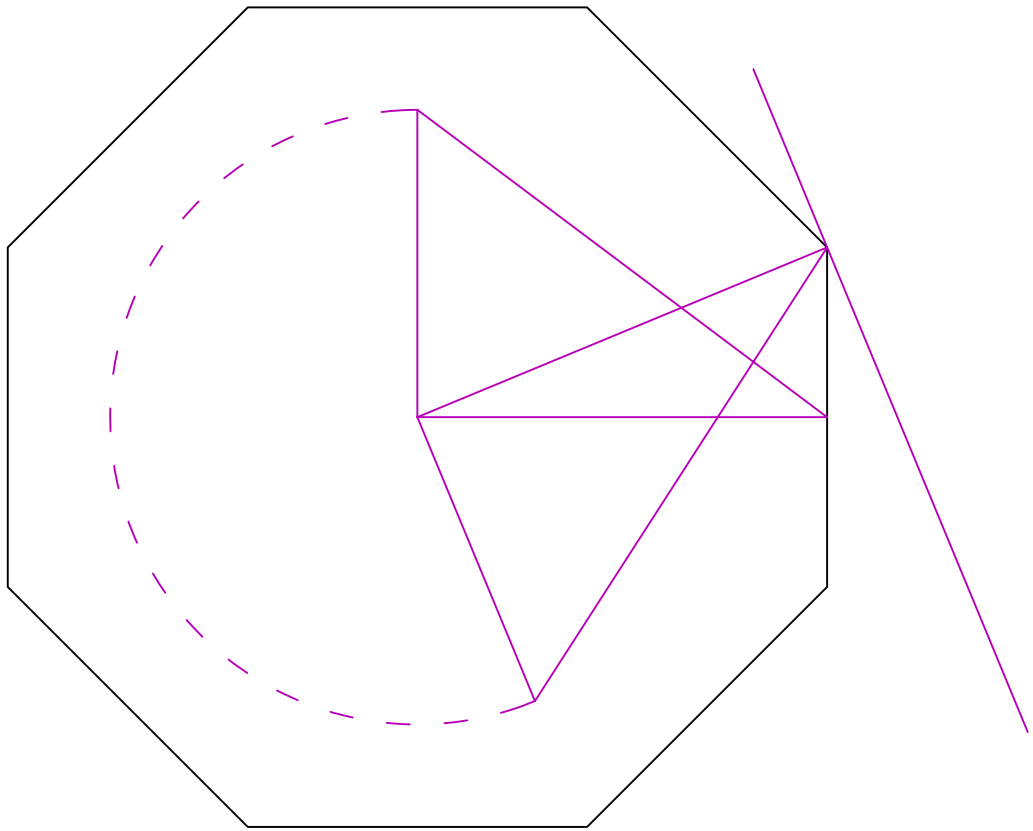
To view the jack rafter side cut and sheathing plane in true shape bring the rafter length and hip length to the ground on the inward extension of the common run.



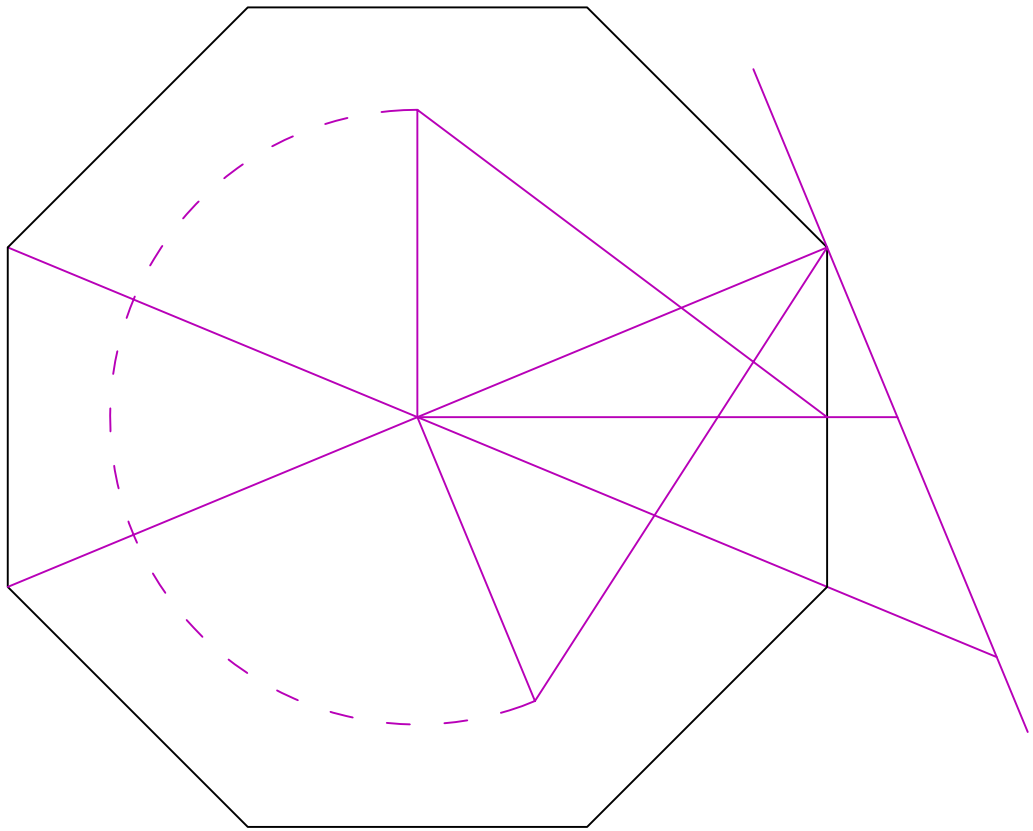
This is the true shape of the sheathing plane and jack rafter side cut.
Note the common length remains square to the eave



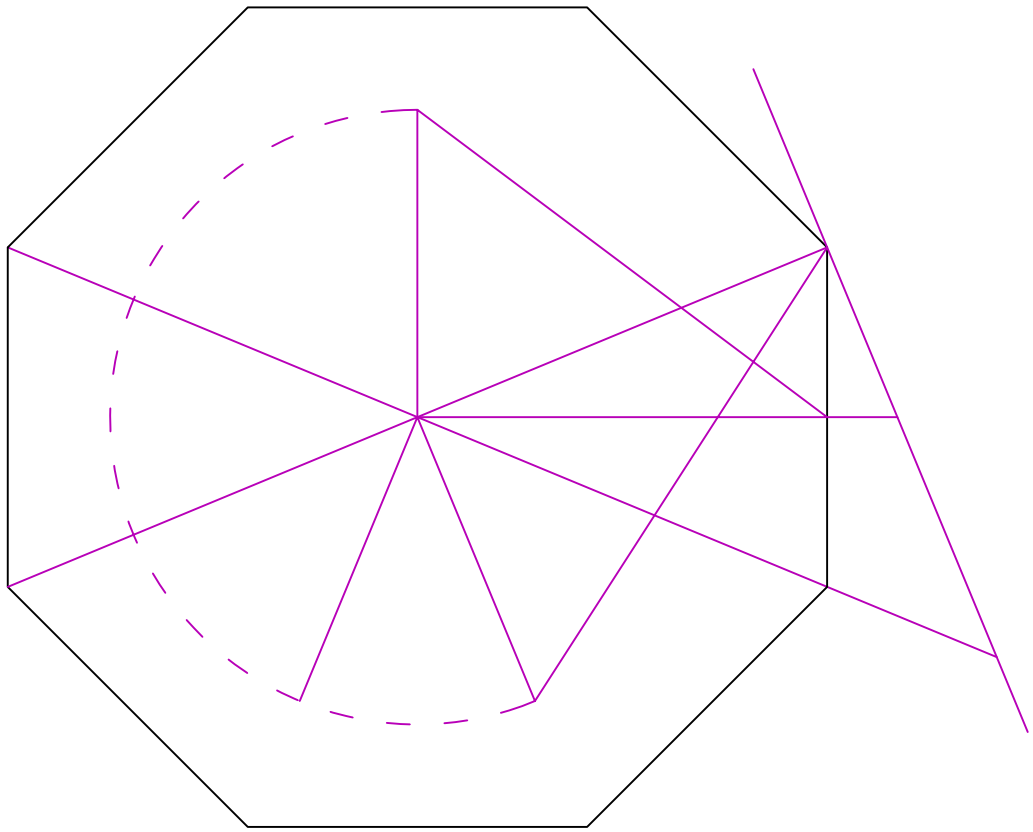
Solve for the side cut of the hip rafter shown here in plan view



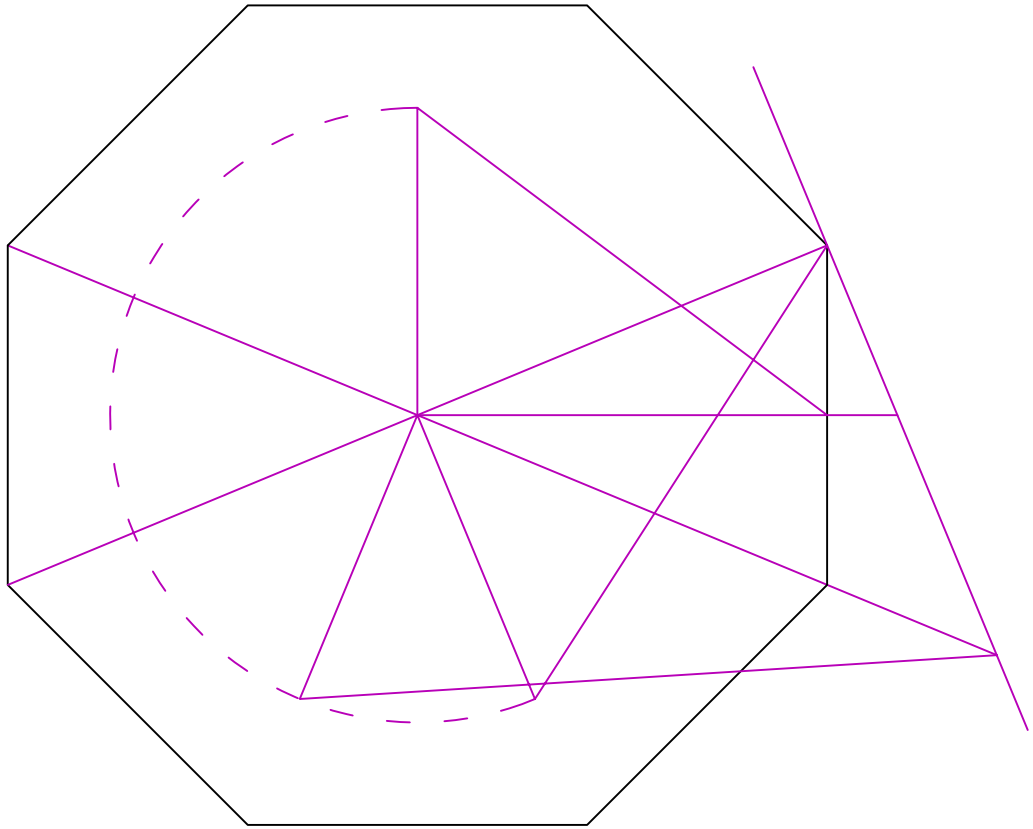
The top of the unbacked hip is level so we can draw a line square to the hip run



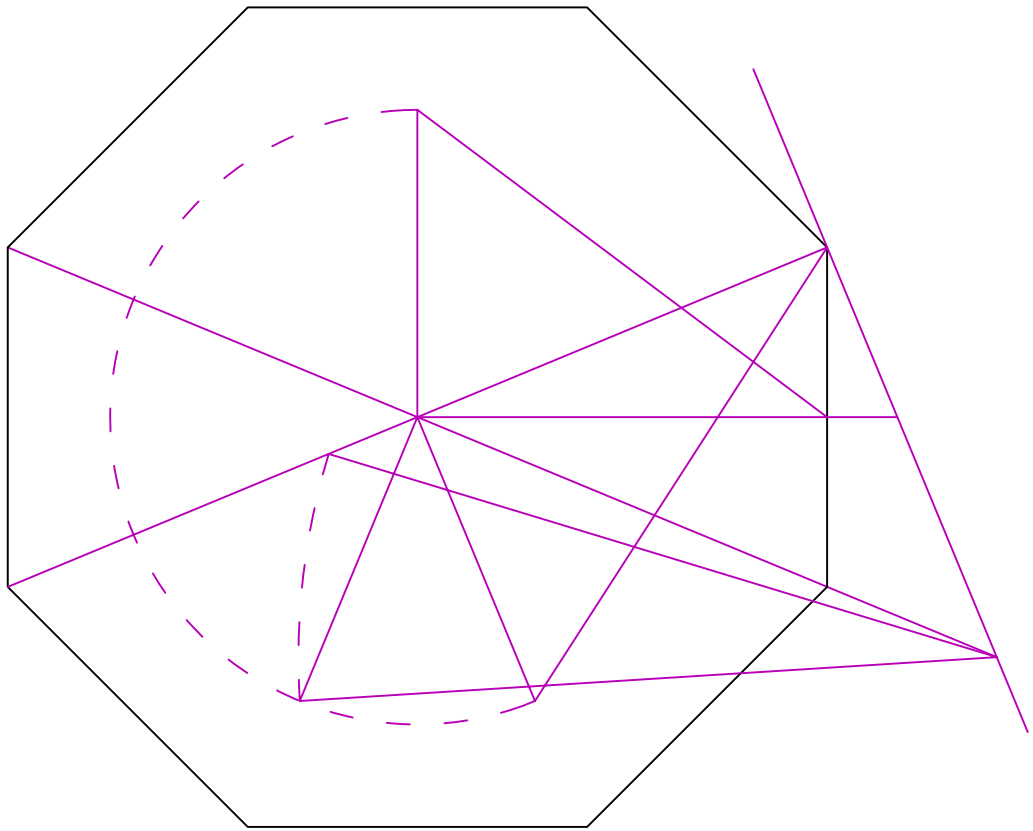
Extend the hip run and the common run and draw the next hip runand extension



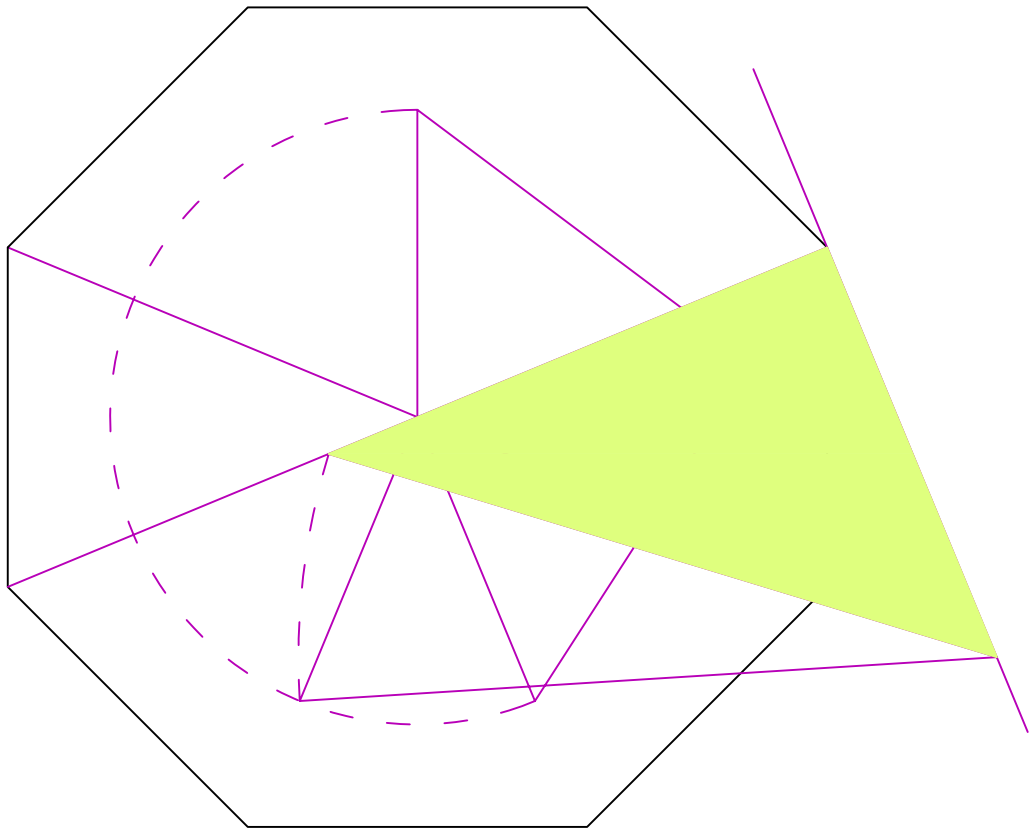
Draw a line the length of the common rise square to the hip extension



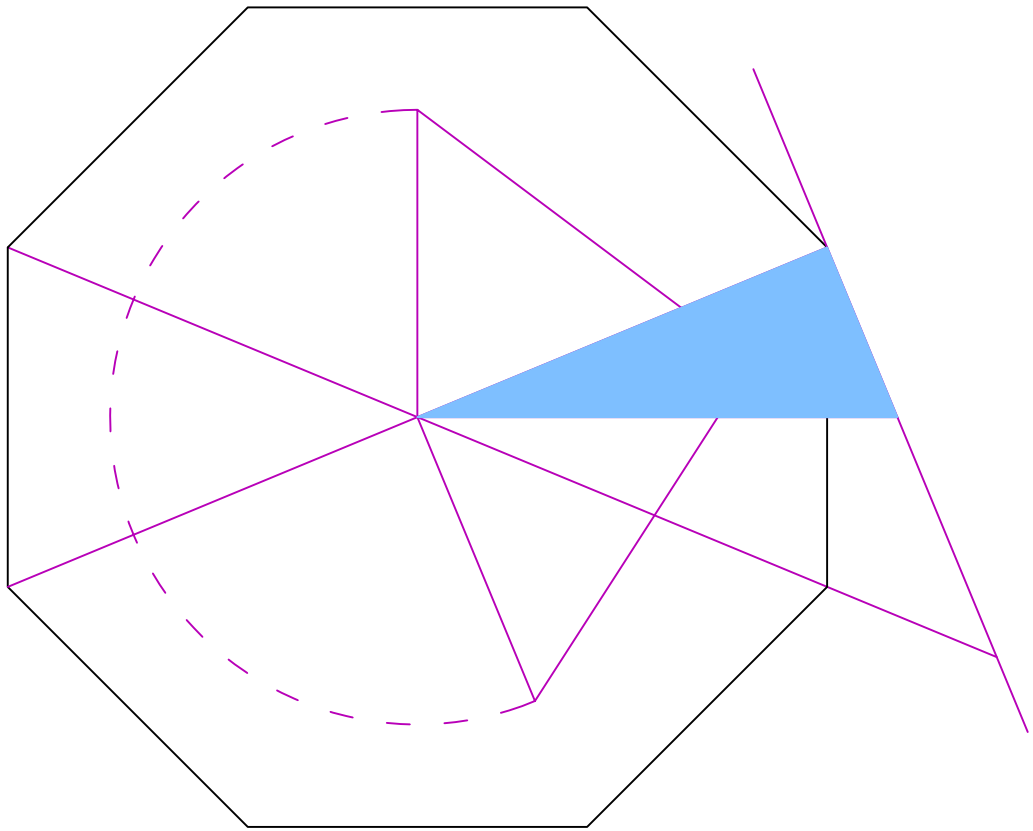
Draw a line from the intersection of the extension of the adjacent hip run and tangent to the top of the common rise. This line I call the header hypotenuse. Do you have a better name?



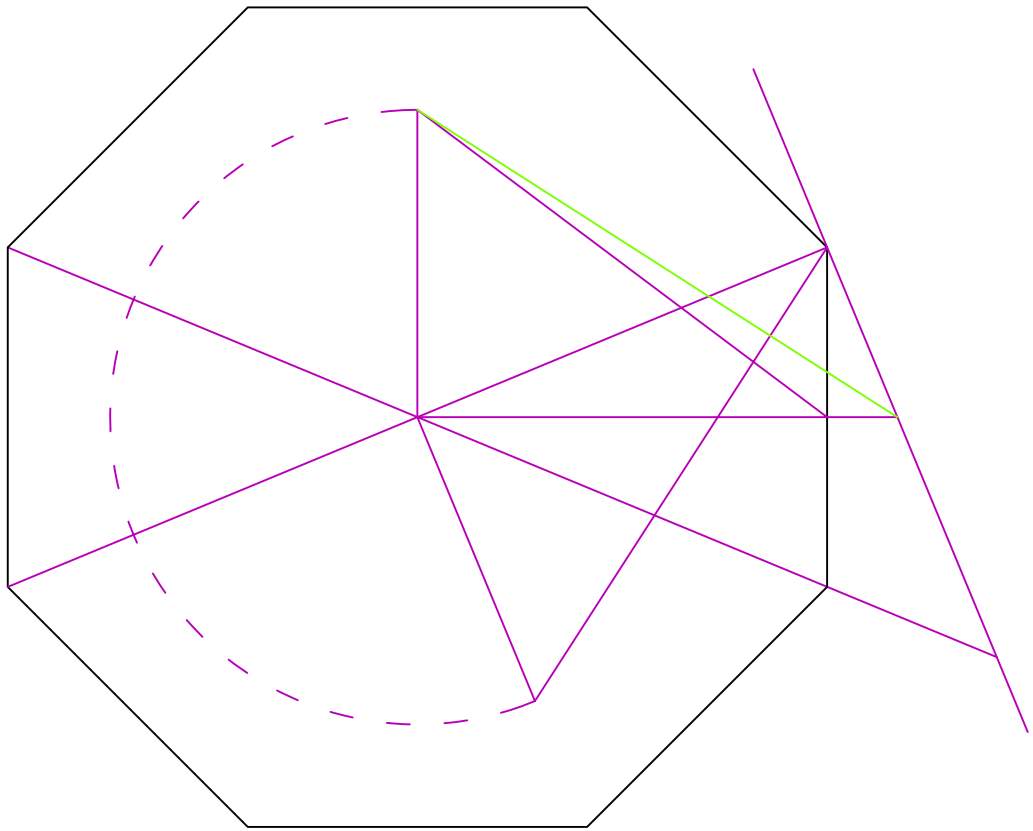
Bring the HH length to ground on the hip run extension this right triangle is the Hip Length, tangent length and HH length. The hip length remains square to the tangent.



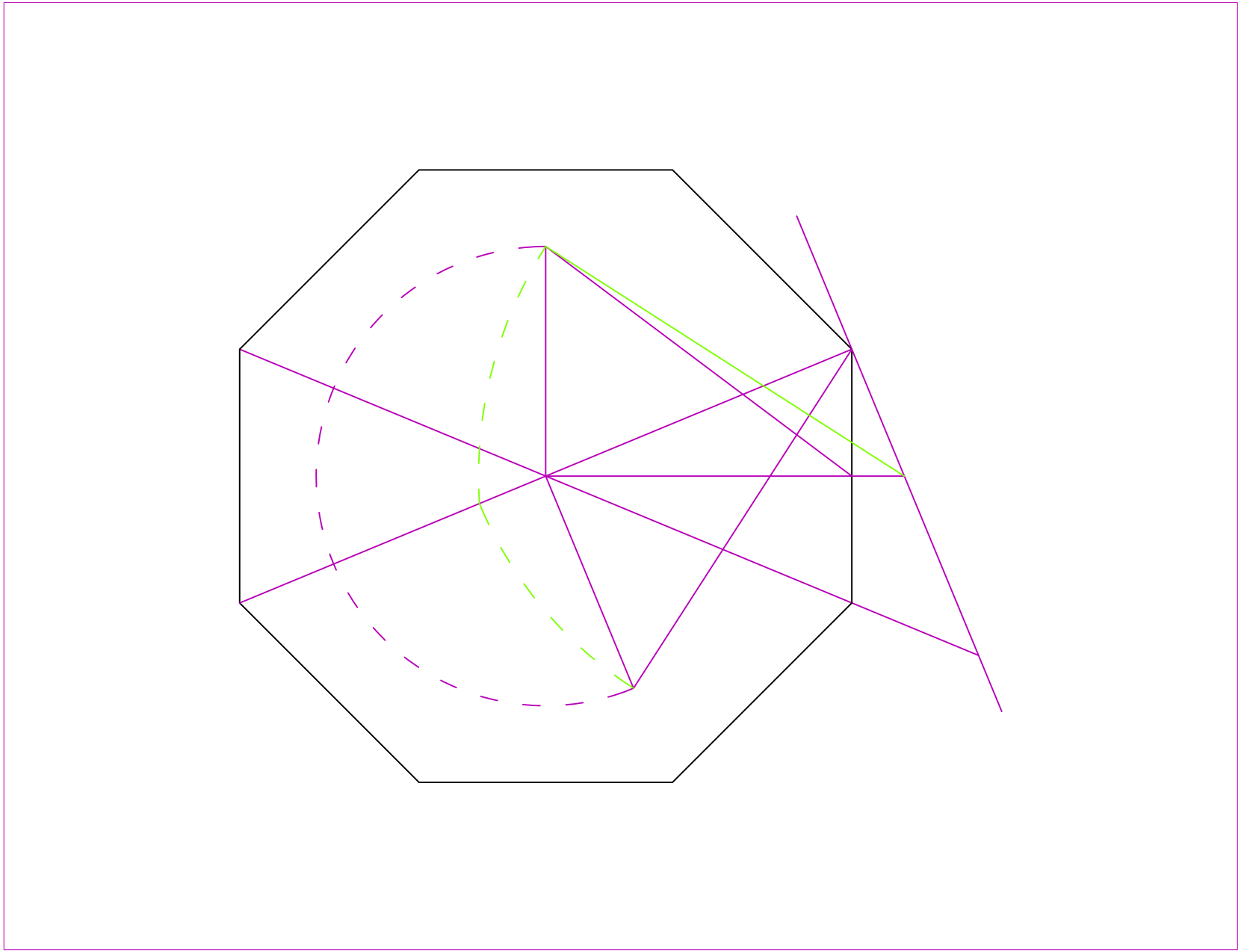
This is the true shape of the full tangent plane, note this plane is square to the tangent. This is the side cut found on framing squares with the octagon rafter framing tables.



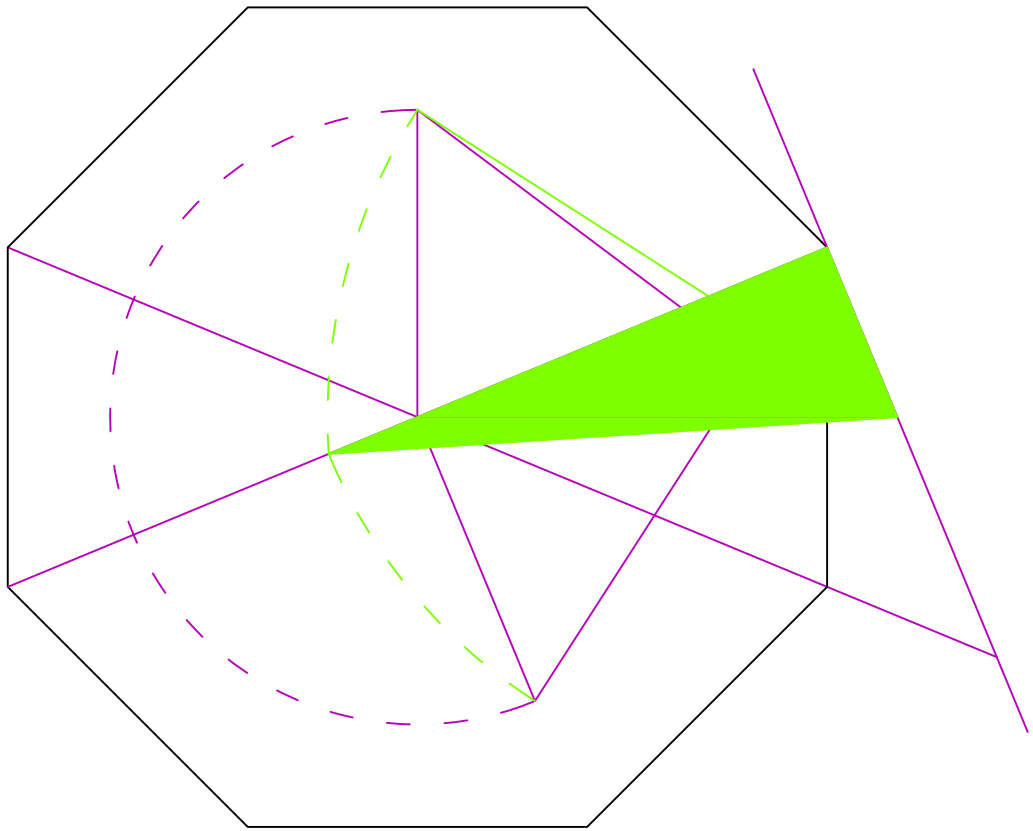
Solve for the cheek (or bisecting) cut of the hip rafter shown here in plan view



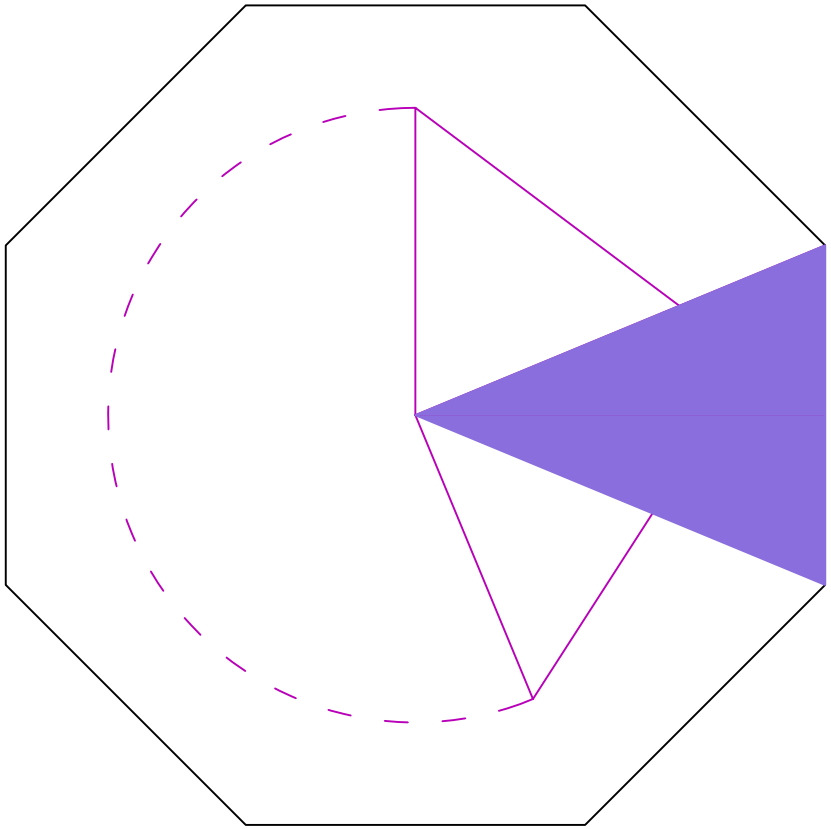
To solve for the layout angle on the unbacked hip of the bisecting cheek cut draw a line from the intersection of the common run extension and the tangent to the top of the common rise



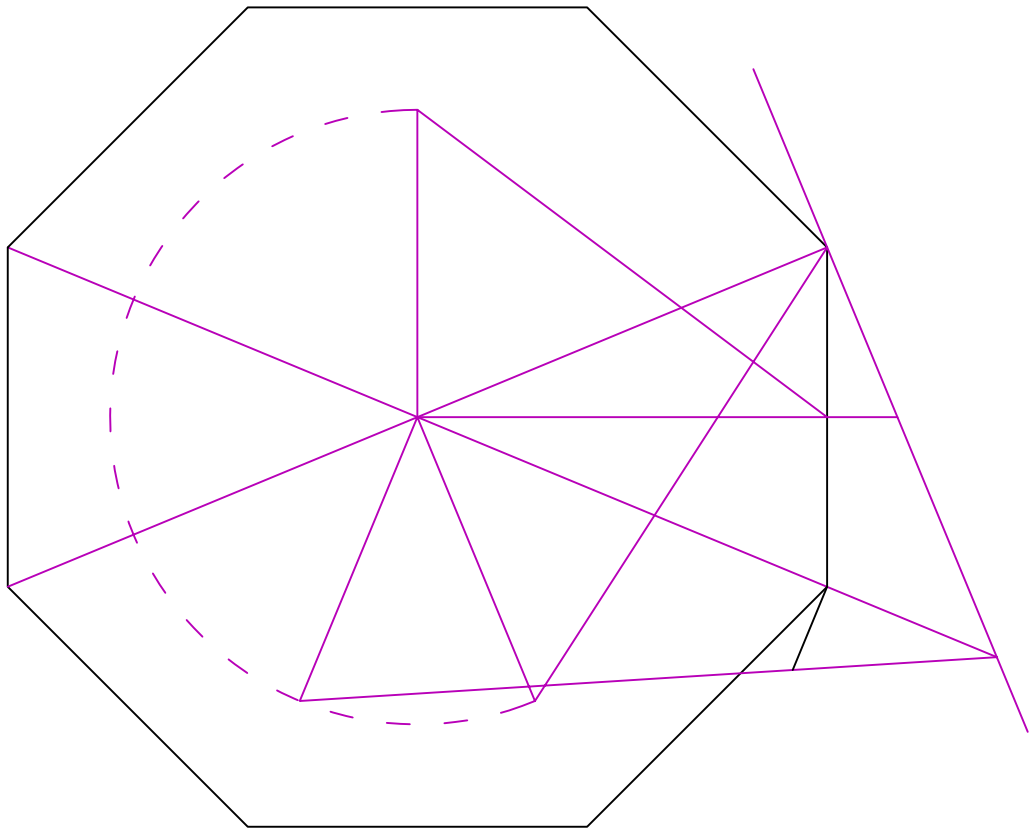
Bring the bisecting tangent hypotenuse length and hip length to the ground on the hip run extension line



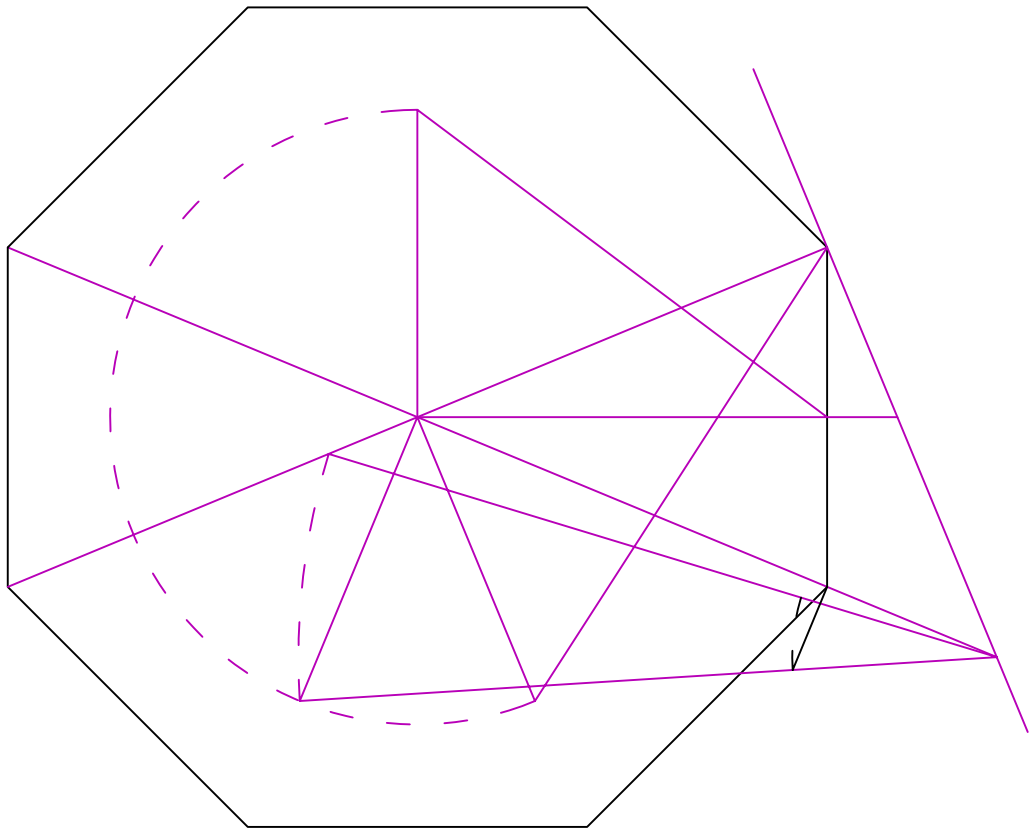
Connect the dots to solve for the bisecting tangent surface This angle would be used to layout the side cut of the hip rafter if all hip rafters were cut equally. This is also the jack rafter layout on the unbacked hip



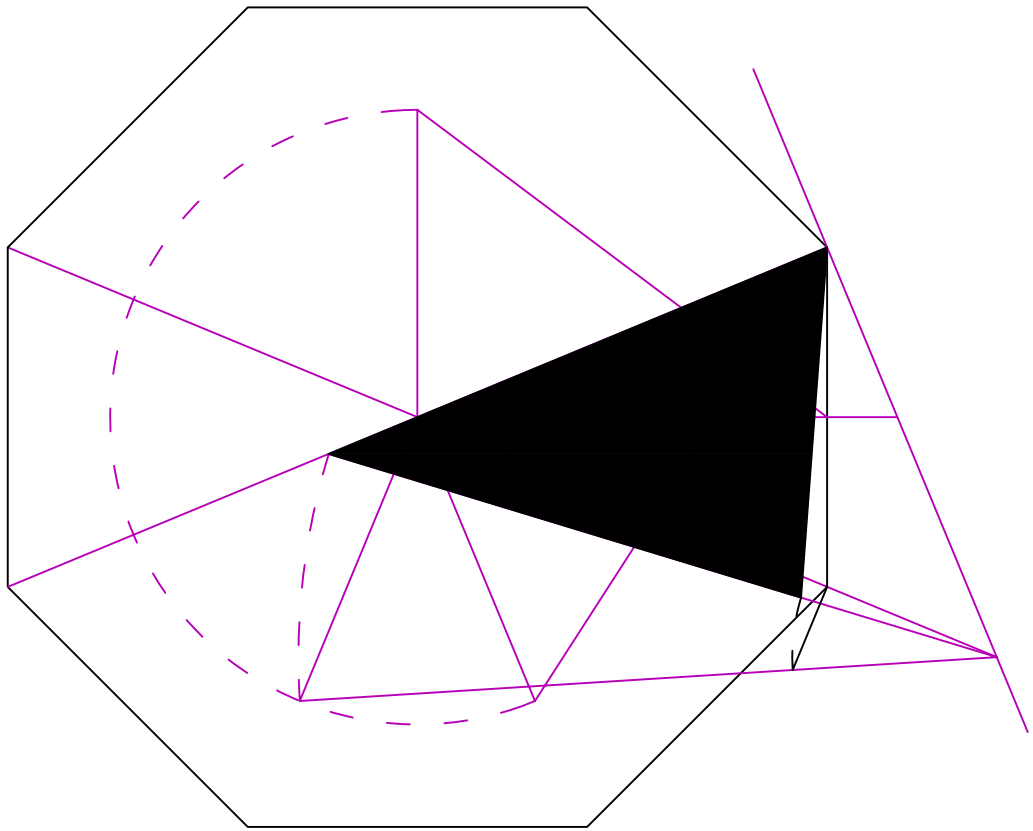
All eave cuts appear the same in plan view



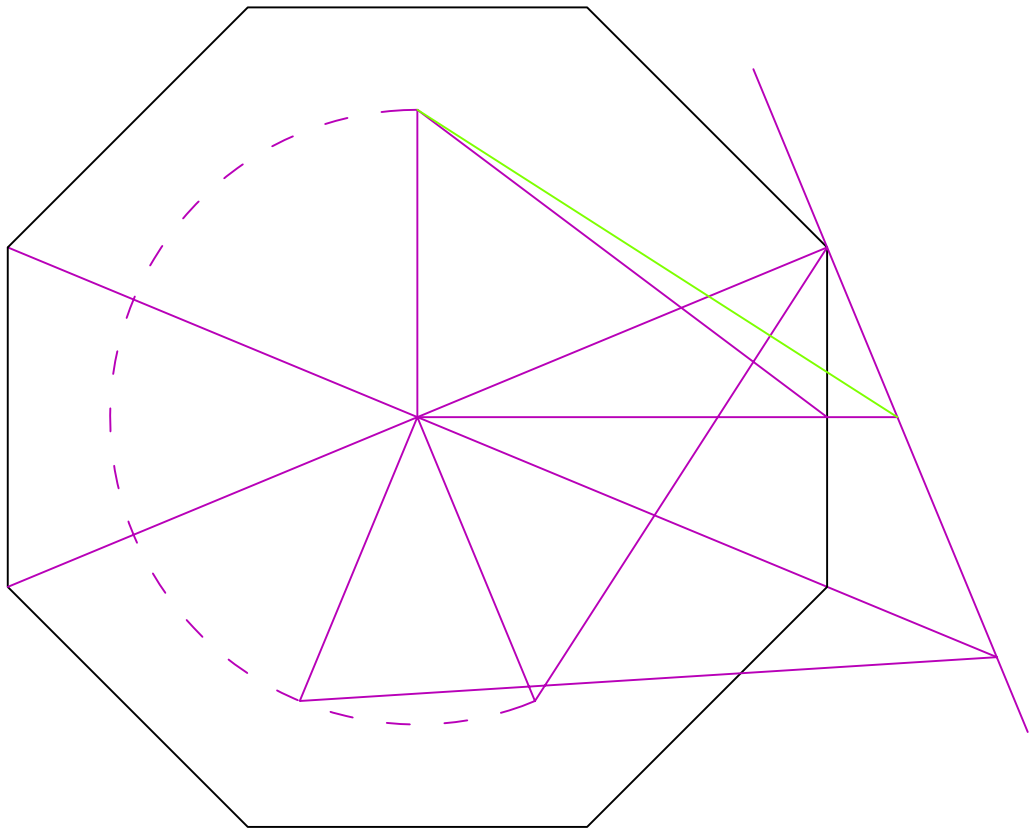
To develop the layout on the unbacked hip for the plumb eave cut first draw a line square to the hip run and hip run extension from the eave corner to the Header hypotenuse.



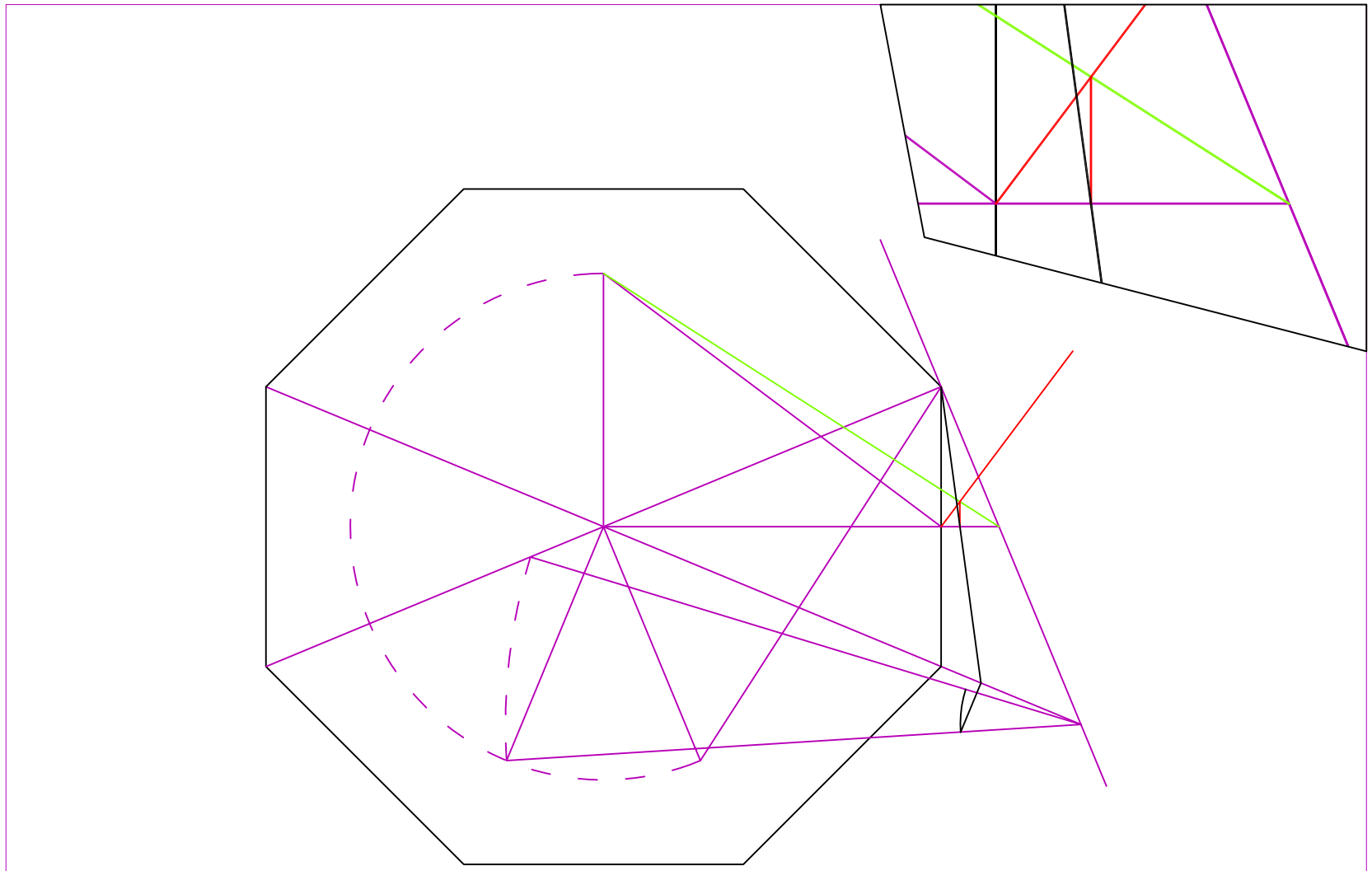
Then drop theHH length and the length from the tangent line along the HH to the ground



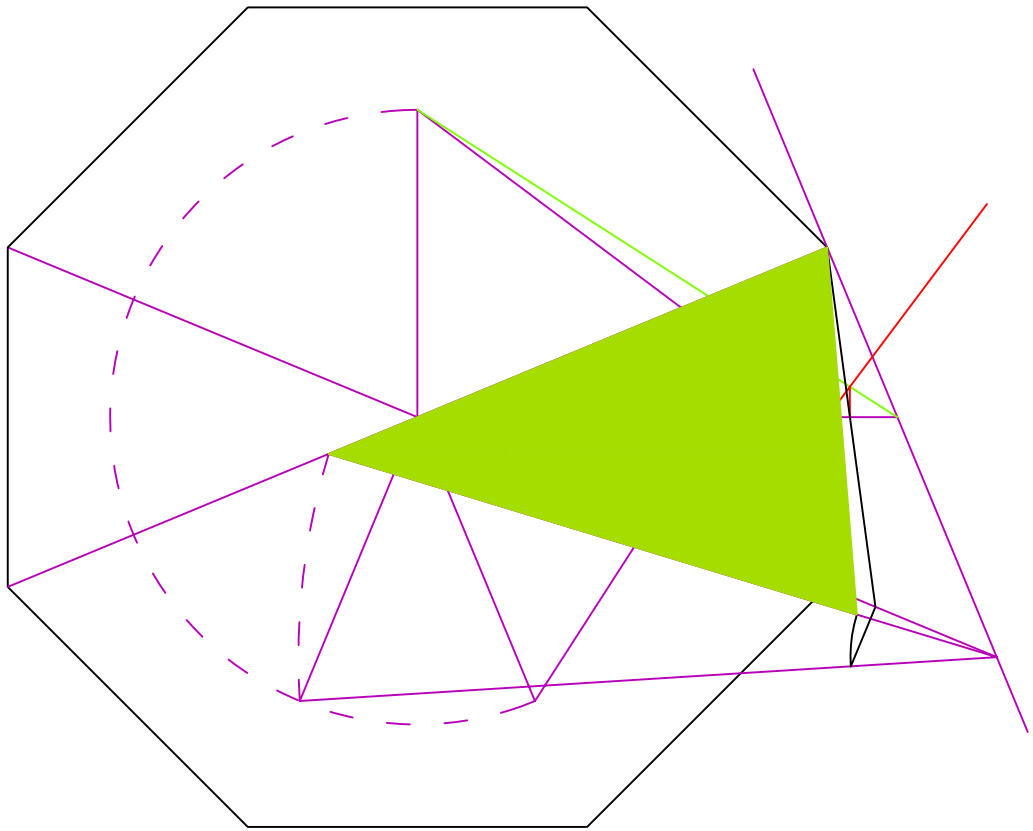
Connect the dots and you have the plumb cut layout angle on the unbacked hip.



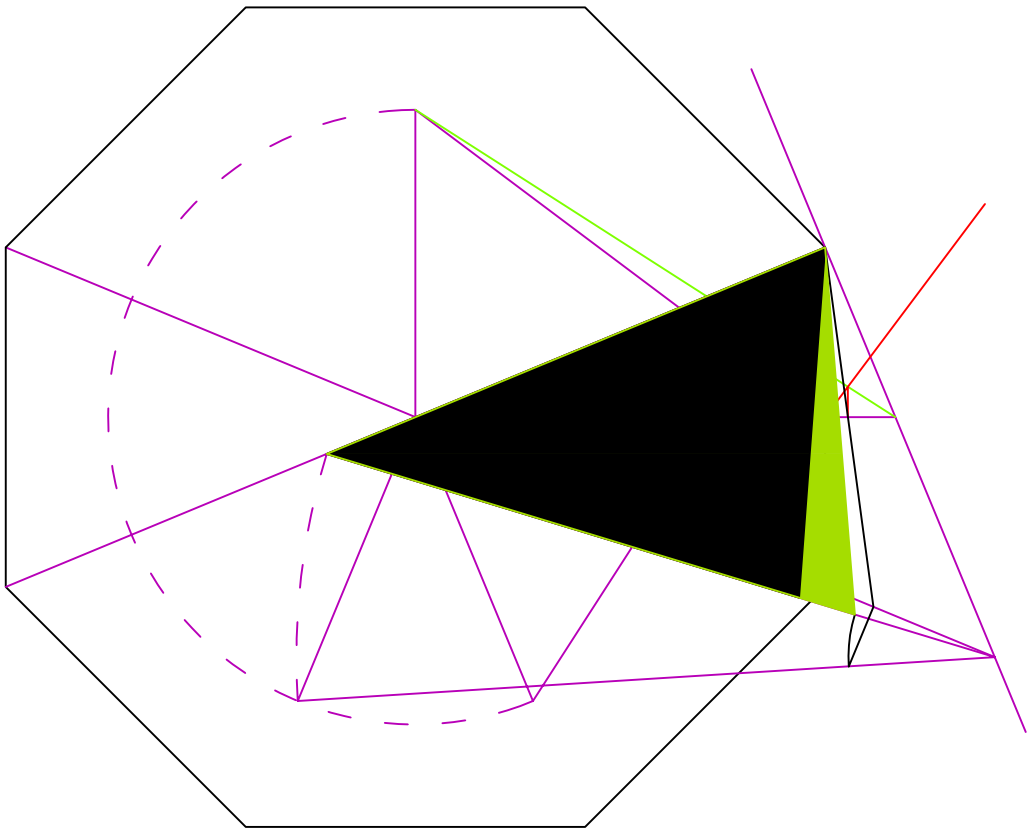
To develop the layout on the unbacked hip for a tail cut in the plane of square cut commons draw a line from the top of the common rafter rise to the intersection of the common rafter extension and the tangent line.



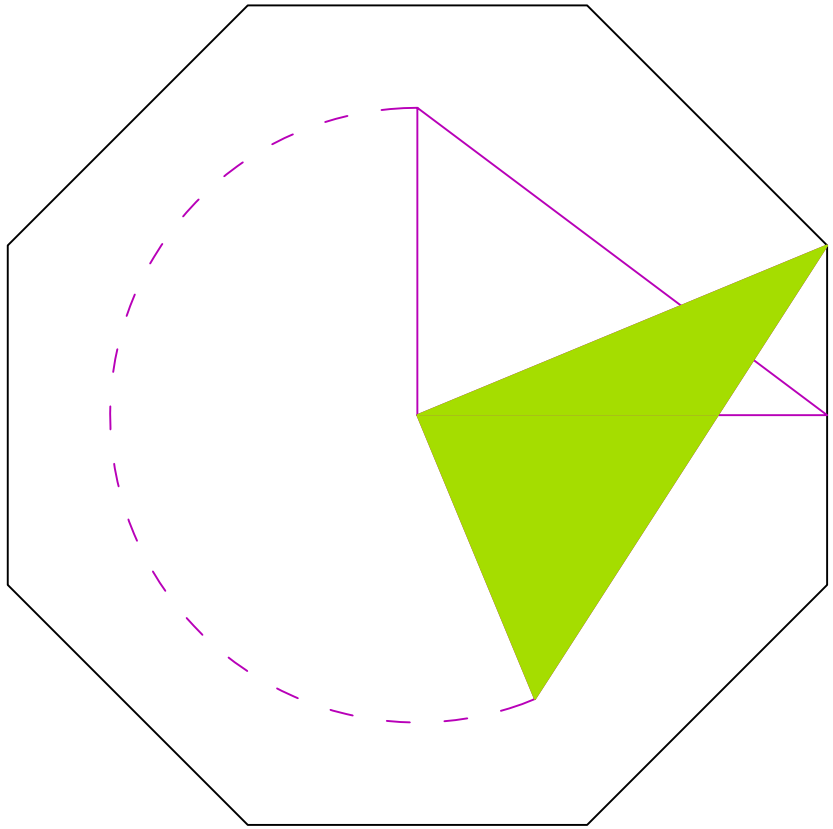
Next draw a line square from the end of the common rafter length until it intesects with the line from the top of rise to the tangent. Drop a line from this intersection to the ground (See Inset) Now draw a line from the eave corner through this intersection and extend to the hip run extension. Square up to the HH and bring this length to ground.



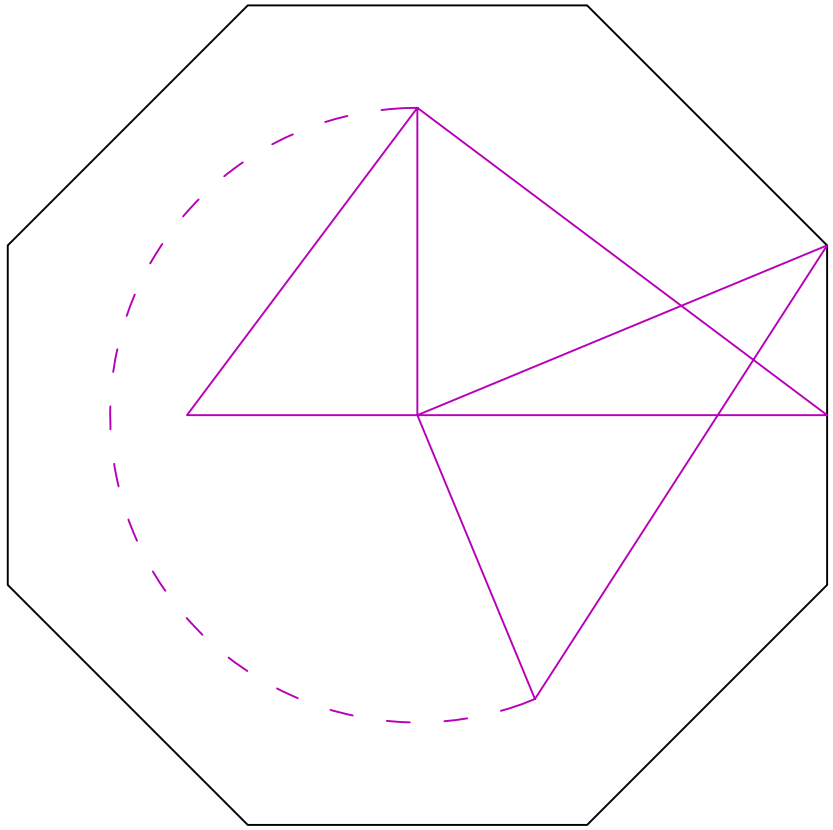
Connect the dots for the layout of the plane of the square cut commons on the top surface of the unbacked hip.



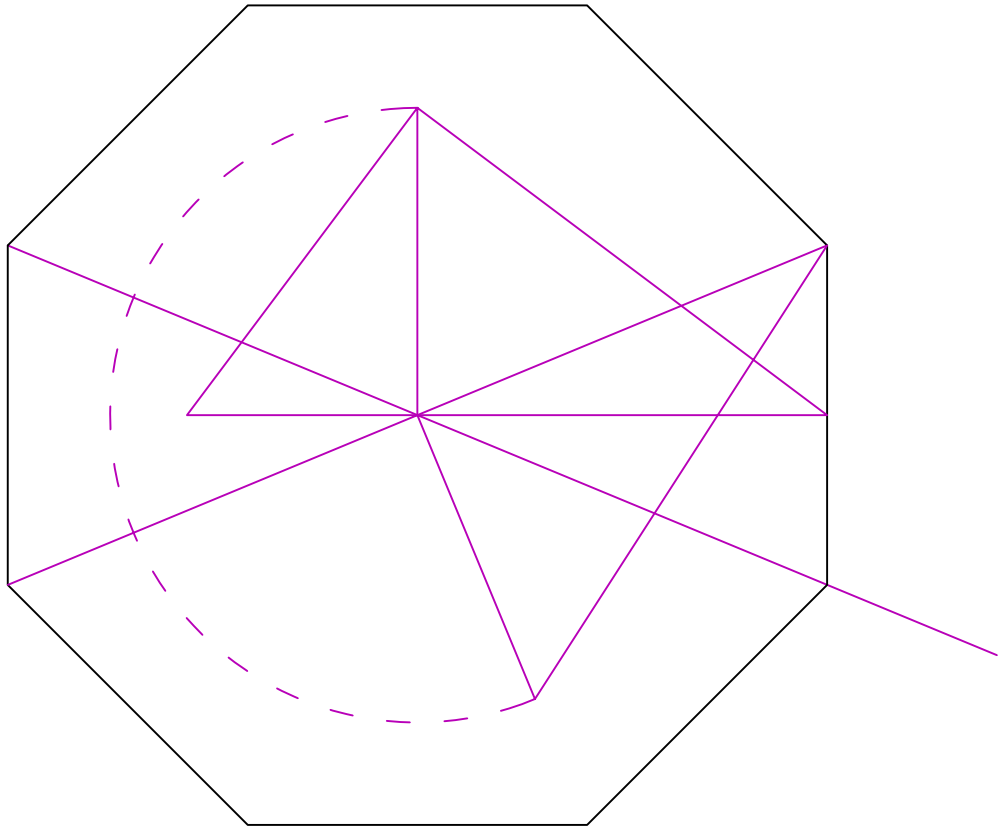
Compare the two layouts



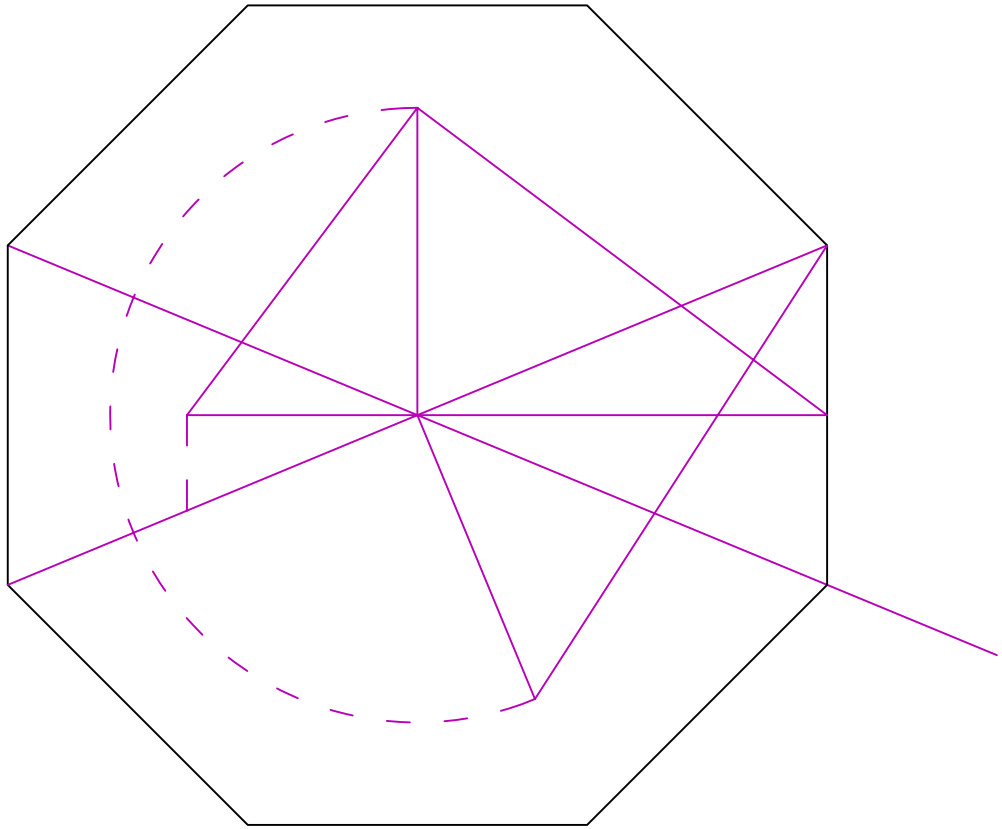
The layout on the side of the hip rafter for plumb cut eave is simple and is found in the hip slope elevation.



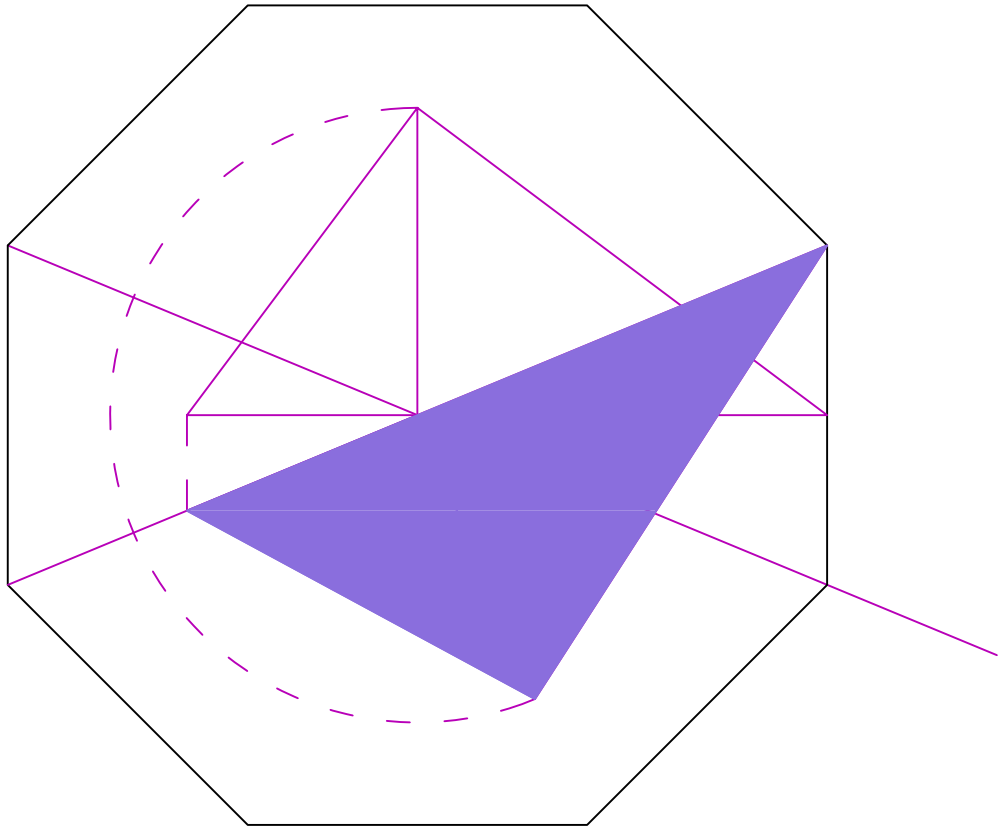
The layout on the side of the hip rafter for the eave cut in the plane of the square cut common requires further development. First extend the common run and draw a line square to the common length. This is the plane of the purlin face.



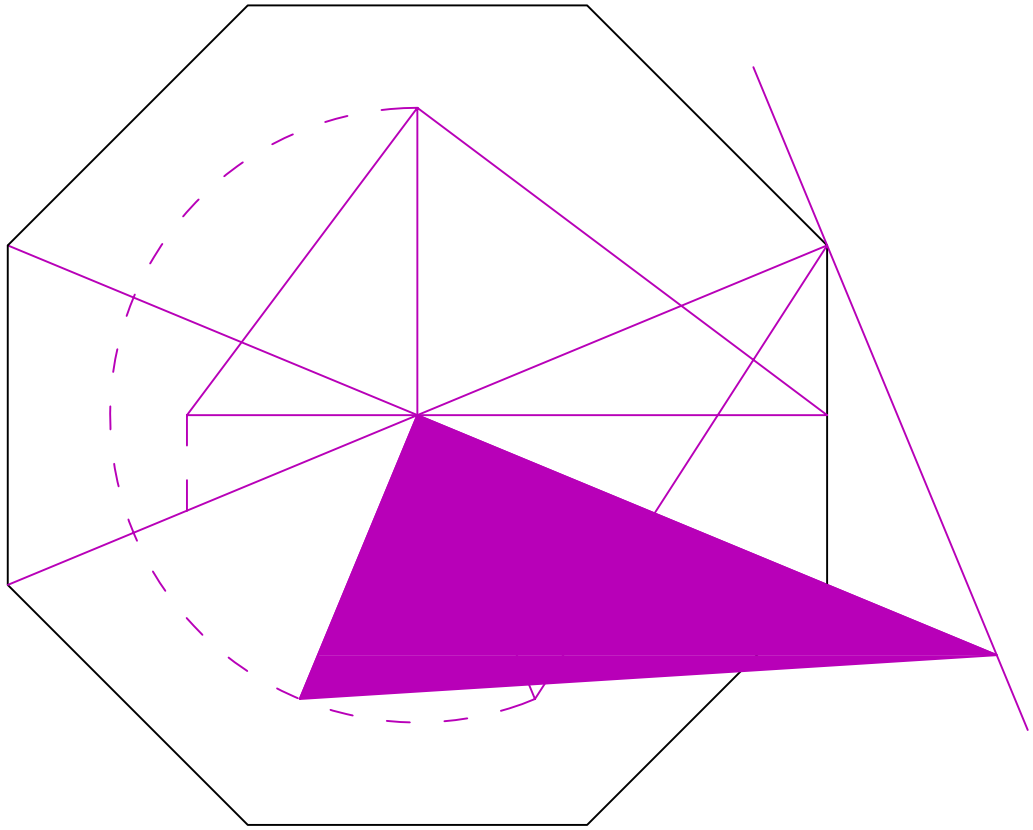
Next extend the run of the two adjacent hips



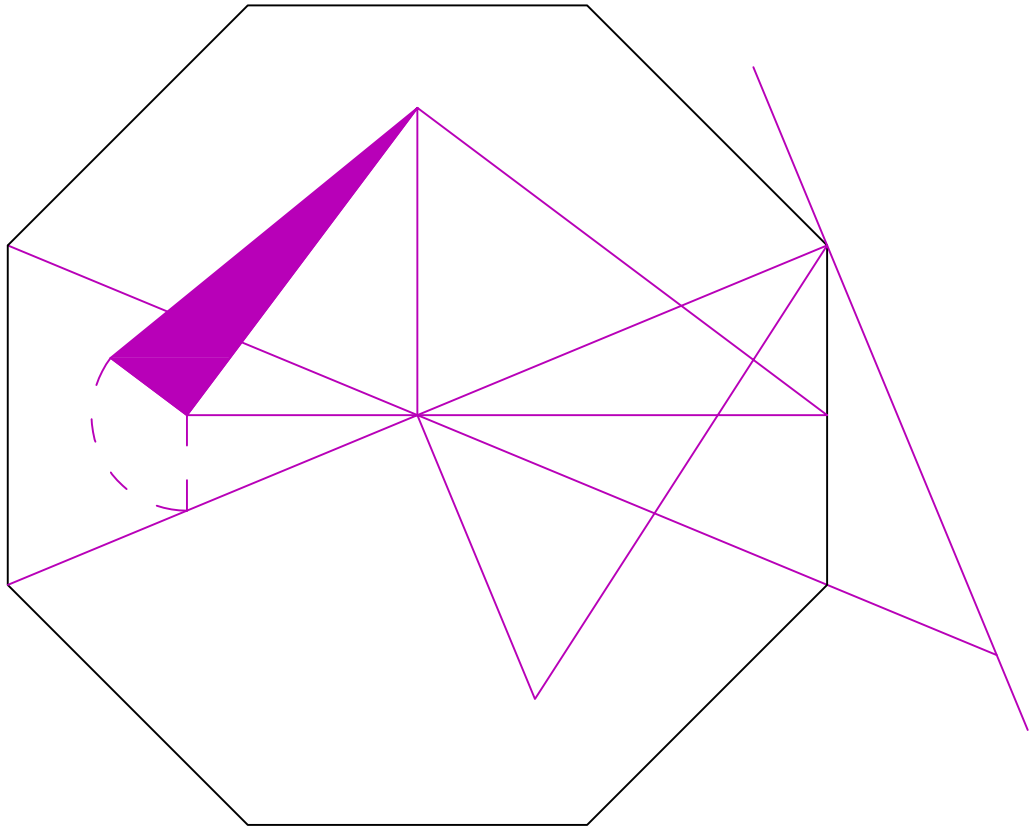
Now draw a line square to the common run extension from the intersection with the square cut common plane to the hip extension



Draw a line from the intersection of the common rise and hip length to the intersection of the latest ground line and hip extension. This is the layout on the side of the hip for square-to-the-common eave cut and for purlins housings.



If you need to know the shape of the housing for a hip on the adjacent hip just draw the HH. The HH run is drawn level on the hip and the angle as shown would trace the bottom of the housing.



To determine the layout on the up or down slope face of the purlin just rotate the length as shown until it is square to the true length of the purlin face.