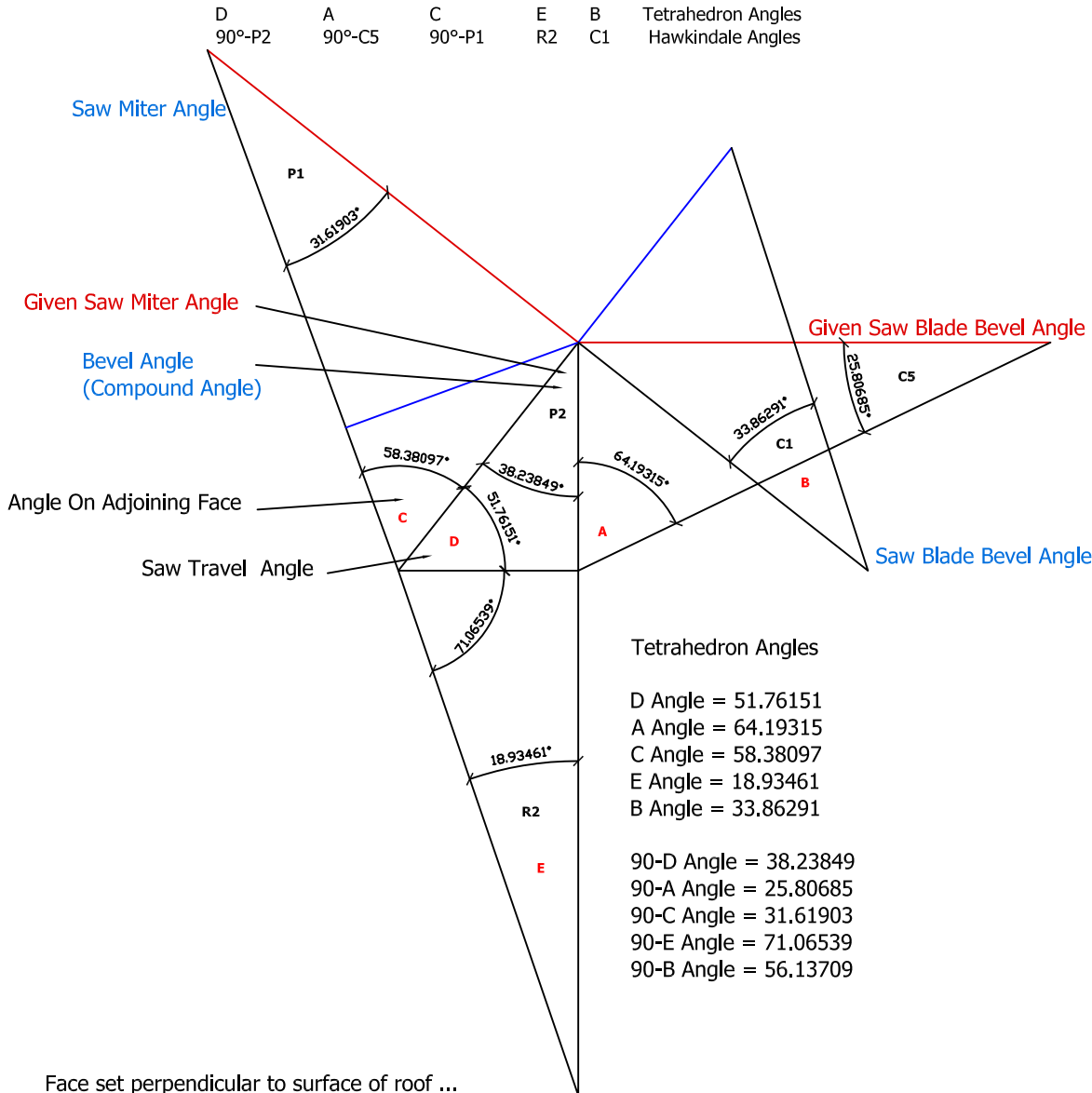


Tetrahedron Extracted from Crown Molding Cut  
 Crown Spring angle = 38° (Roof Pitch Angle)  
 Saw Miter Angle = 31.62°  
 Saw Blade Bevel Angle = 33.86°

**Saw Blade Bevel of 33.86° produces 38.24° Bevel Angle**



**Tetrahedron Angles**

- D Angle = 51.76151
- A Angle = 64.19315
- C Angle = 58.38097
- E Angle = 18.93461
- B Angle = 33.86291
- 90-D Angle = 38.23849
- 90-A Angle = 25.80685
- 90-C Angle = 31.61903
- 90-E Angle = 71.06539
- 90-B Angle = 56.13709

Face set perpendicular to surface of roof ...  
 Crown Molding laying flat in Compound Miter Saw...  
 Saw Miter Angle = **P1** = 31.62° (Crown Molding Miter Angle)  
 Saw Blade Bevel Angle = **C1** = 33.86° (Crown Molding Saw Bevel angle)

Cut produces Bevel Angle (compound angle) = **P2** = 38.24° on face set perpendicular to roof surface = **Jack Rafter Side Cut Angle**

**Saw Miter Angle on Adjoining Face** =  $\arctan(\tan \text{ Given Saw Blade Bevel Angle } \div \cos \text{ Given Saw Miter Angle})$

**Saw Miter Angle on Adjoining Face** =  $\arctan(\tan 25.80 \div \cos 38.24^\circ) = 31.62^\circ$

**Saw Blade Bevel Angle on Adjoining Face** =  $\arctan(\cos \text{ Saw Miter Angle on Adjoining Face } \times \tan \text{ Given Saw Miter Angle})$

**Saw Blade Bevel Angle on Adjoining Face** =  $\arctan(\cos 31.62^\circ \times \tan 38.24^\circ) = 33.86^\circ$

Crown Miter Angle =  $\arctan(\sin(\text{ Spring Angle }) \div \tan(\text{ Wall Corner Angle } \div 2))$

Crown Miter Angle =  $\arctan(\sin(38^\circ) \div \tan(45^\circ)) = 31.62^\circ$

Crown Saw Blade Bevel Angle =  $\arcsin(\cos(\text{ Spring Angle }) \times \cos(\text{ Wall Corner Angle } \div 2))$

Crown Saw Blade Bevel Angle =  $\arcsin(\cos(38^\circ) \times \cos(45^\circ)) = 33.86^\circ$

Jack Rafter Side Cut Angle =  $\arccos(\sin(\text{Plan Angle }) \div \cos(\text{ Hip Rafter Backing Angle}))$

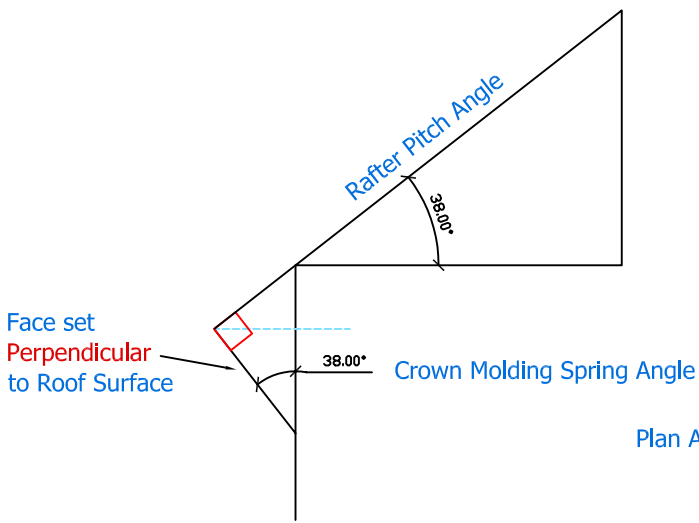
Jack Rafter Side Cut Angle =  $\arccos(\sin(45^\circ) \div \cos(25.81^\circ)) = 38.24^\circ$

Jack Rafter Side Cut Angle =  $\arctan(\cos(\text{Pitch Angle }) \div \tan(\text{ Plan Angle}))$

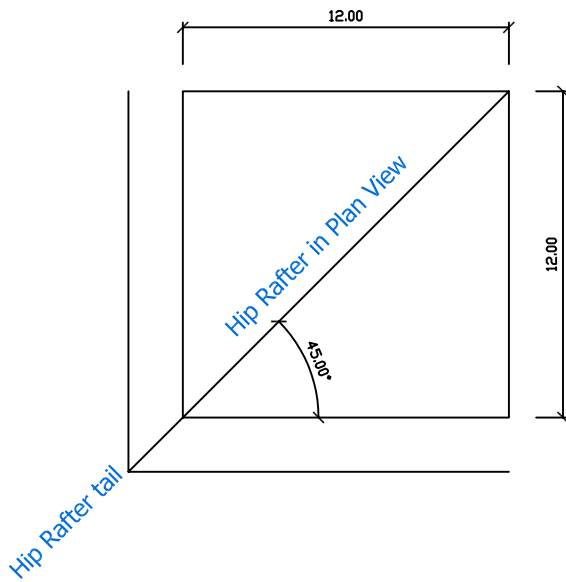
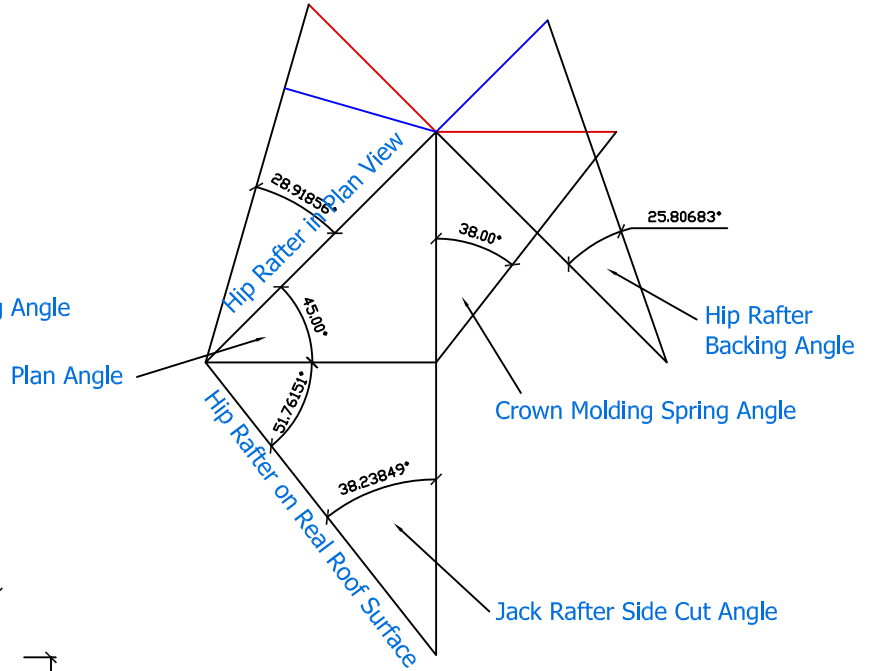
Jack Rafter Side Cut Angle =  $\arctan(\cos(38^\circ) \div \tan(45^\circ)) = 38.24^\circ$

Bevel Angle (compound angle) =  $\arctan(\cos(\text{Spring Angle }) \div \tan(\text{ Wall Corner Angle } \div 2))$

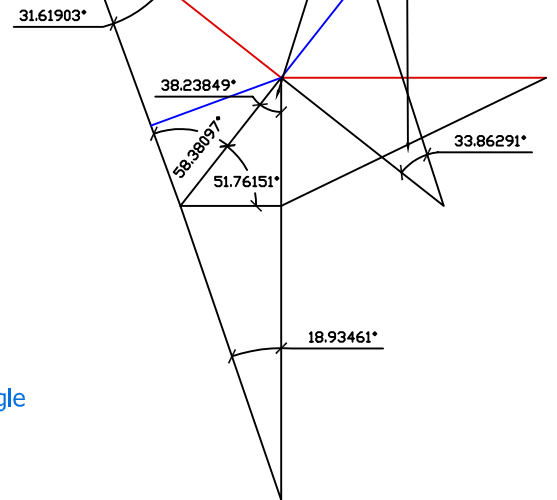
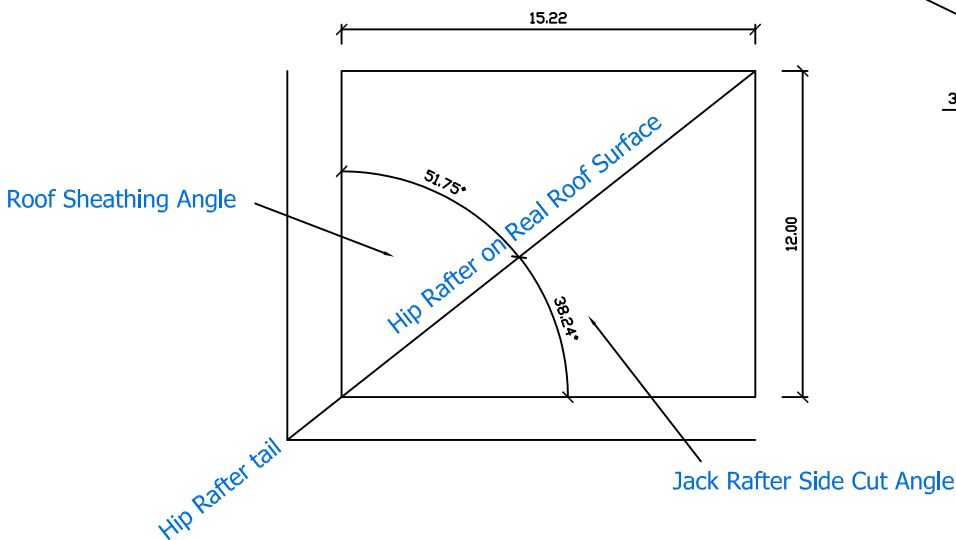
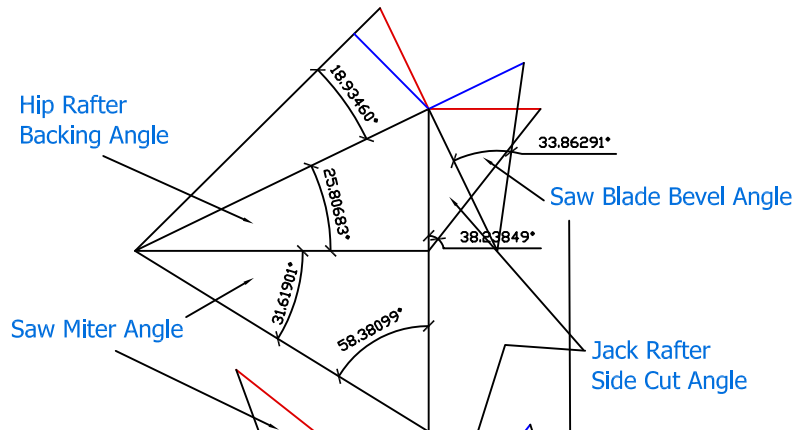
Bevel Angle (compound angle) =  $\arctan(\cos(38^\circ) \div \tan(45^\circ)) = 38.24^\circ$



Tetrahedron base with Crown Molding Spring Angle Crown Molding Plan Angle

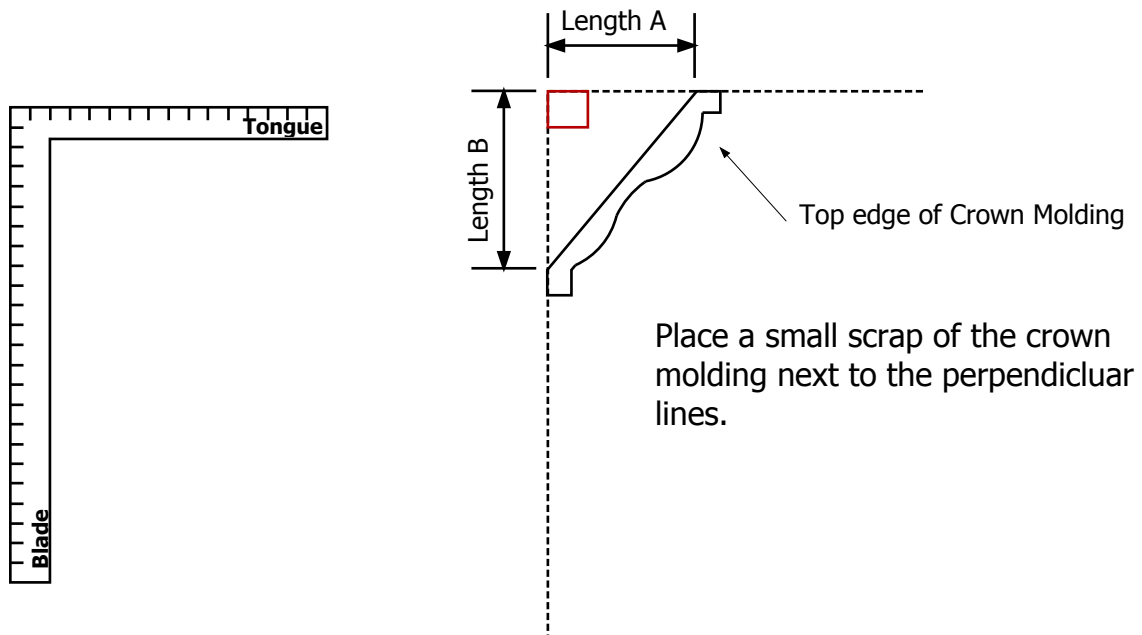


Tetrahedron developed from Hip Rafter Backing Angle Jack Rafter Side Cut Angle



Tetrahedron Extracted from Crown Molding Cut  
 Saw Miter Angle =  $31.62^\circ$   
 Saw Blade Bevel Angle =  $33.86^\circ$   
 Compound Angle =  $38.24^\circ$

# Calculating the Crown Spring Angle using a Steel Framing Square



1) Draw 2 perpendicular lines with framing square

2) Measure lengths A & B

3) Crown Spring Angle =  $\arctan(\text{Length A} \div \text{Length B})$   
 Length A =  $3 \frac{1}{8}'' = 3.125''$   
 Length B =  $4''$   
 Crown Spring Angle =  $\arctan(3.125 \div 4) = 37.99873^\circ = 38^\circ$

CMC example of converting triangle run & rise to degrees

[On/C][On/C]  
 [3.125"] [÷] [4"] [=] 0.78125  
 [Conv][Tan] DEG 37.99873°

