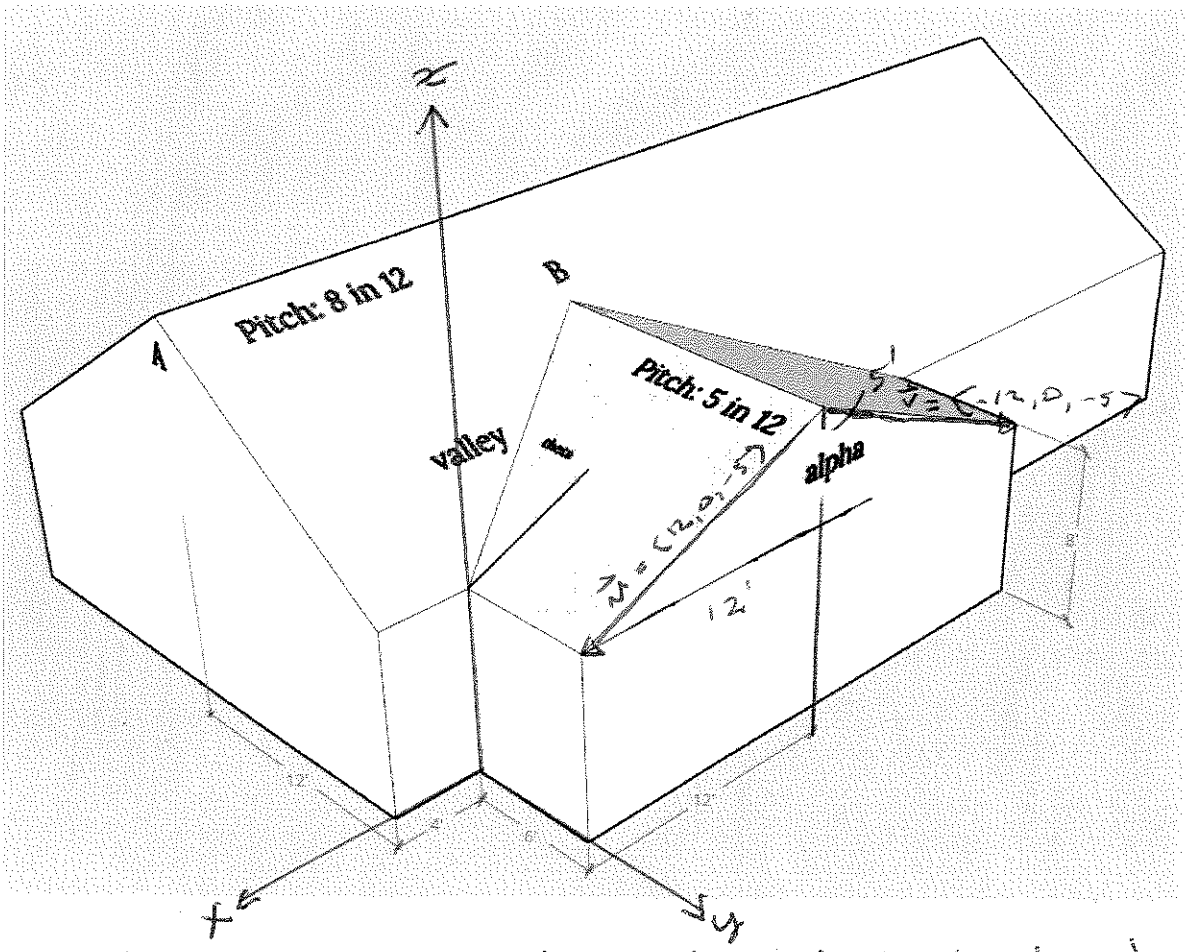


Find α in radians (2 decimal places)

① use trig.

$$\tan\left(\frac{\alpha}{2}\right) = \frac{12}{5}$$

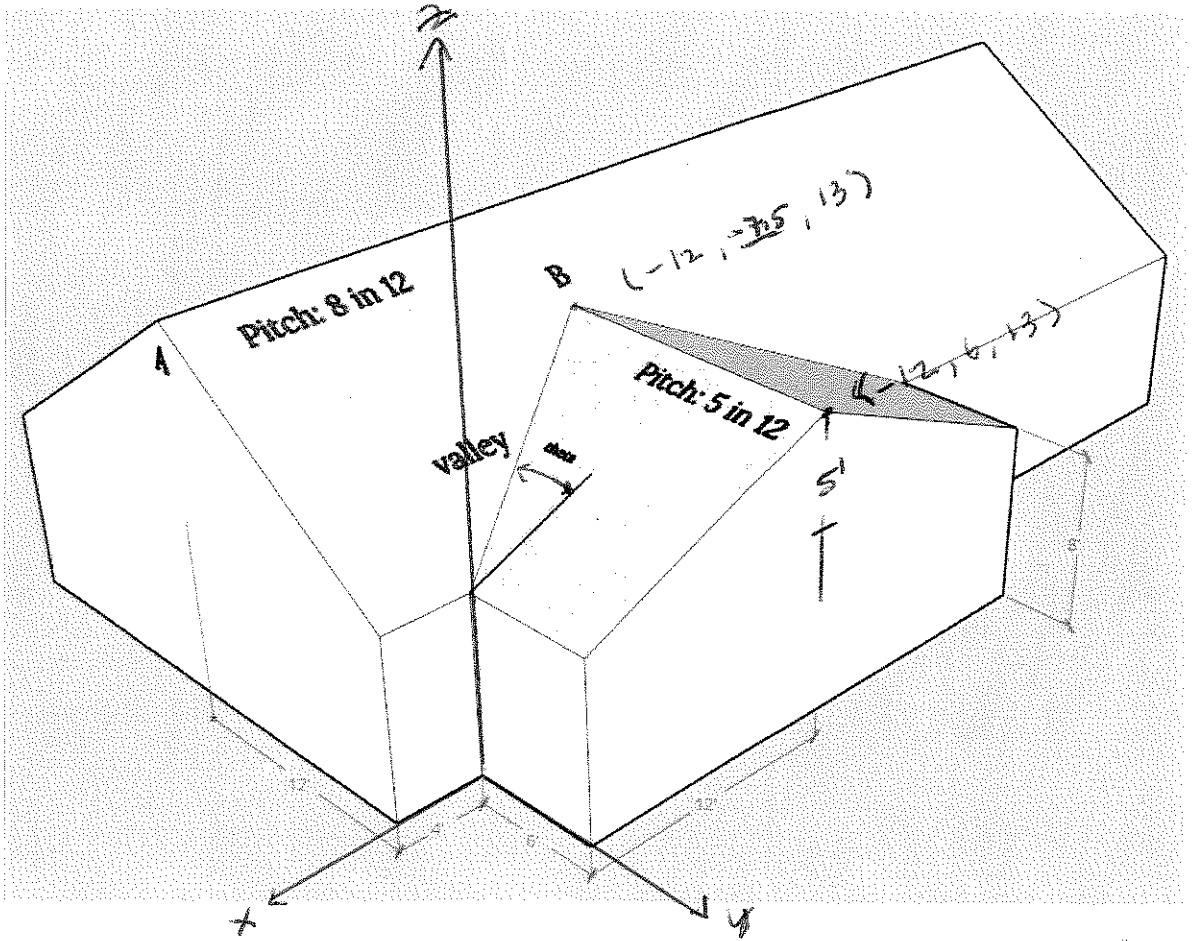
$$\Rightarrow \alpha = 2\arctan\left(\frac{12}{5}\right) = 2.35$$

② use vectors

$$\vec{n} \cdot \vec{v} = |\vec{n}||\vec{v}|\cos(\alpha)$$

$$\Rightarrow -119 = \sqrt{169}\sqrt{169}\cos(\alpha)$$

$$\Rightarrow \alpha = \cos^{-1}\left(\frac{-119}{169}\right) = 2.35$$



Find θ in degrees (1 decimal place)

1st: Find the y value @ B.

$$\frac{8}{12} = \frac{5}{y} \Rightarrow y = \frac{12 \cdot 5}{8} = \frac{15}{2} = 7.5$$

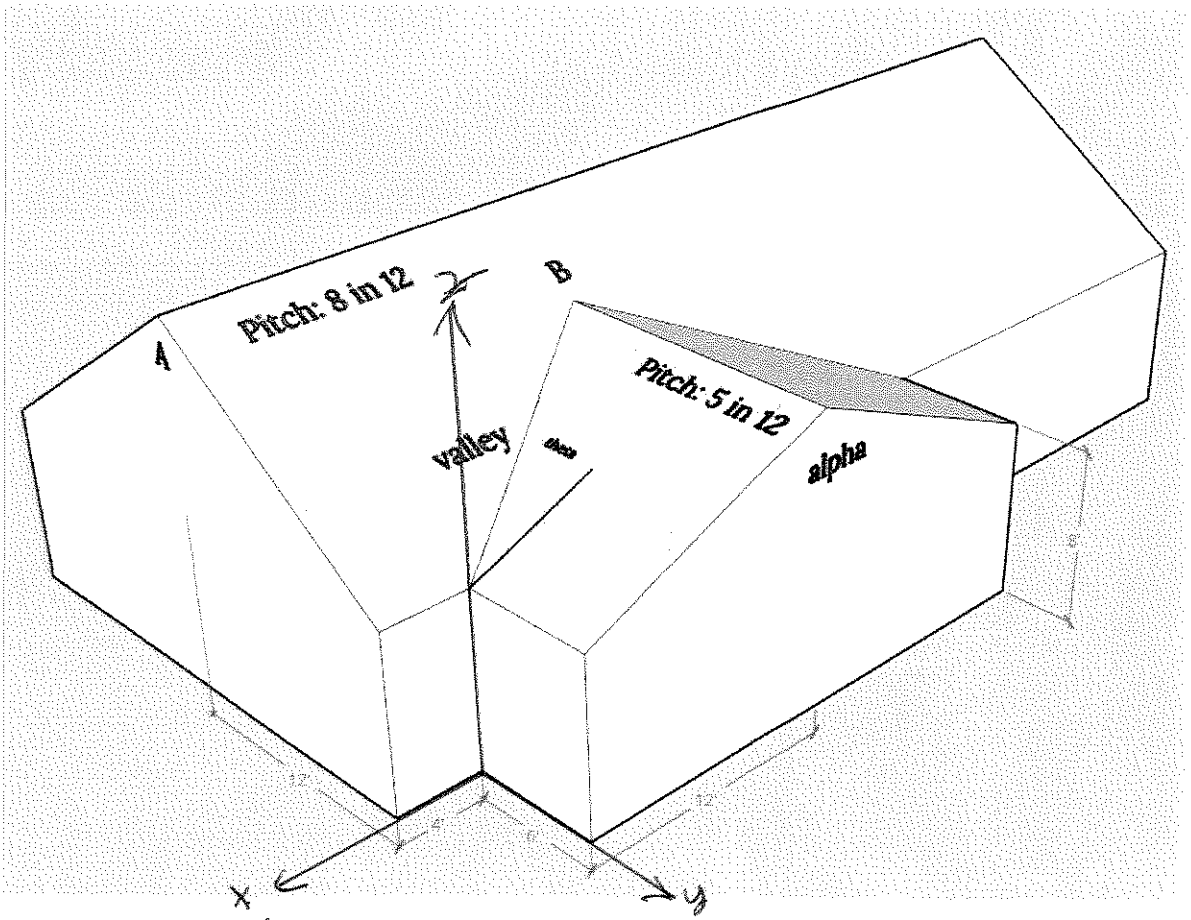
2nd: Find any vectors in the valley and // to the front left gable end.

valley: $\vec{v} = \langle -12, -7.5, 5 \rangle$

gable: $\vec{u} = \langle -12, 0, 5 \rangle$

3rd: Find θ

$$\theta = \cos^{-1}\left(\frac{\vec{u} \cdot \vec{v}}{|\vec{u}||\vec{v}|}\right) = \cos^{-1}\left(\frac{169}{\sqrt{169}\sqrt{225.25}}\right) = 30.0^\circ$$



Find the distance from A to B. (exact).

$A(4, -12, 16)$

$B(-12, -7.5, 13)$

Distance : $D(A, B) = \sqrt{16^2 + 4.5^2 + 3^2} = \sqrt{285.25}$

AND

A vector $\overrightarrow{AB} = \langle -16, 4.5, -3 \rangle$ w/ parallel unit vector

$$\frac{1}{\sqrt{285.25}} \langle -16, 4.5, -3 \rangle$$