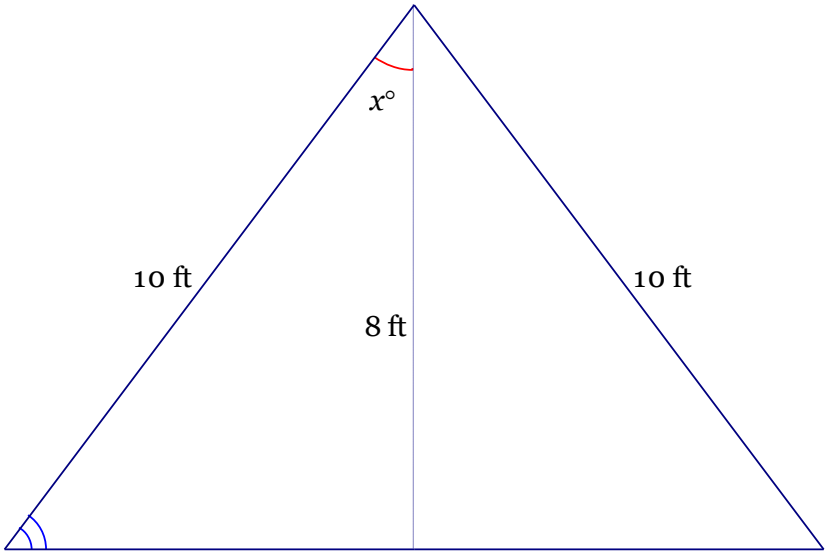
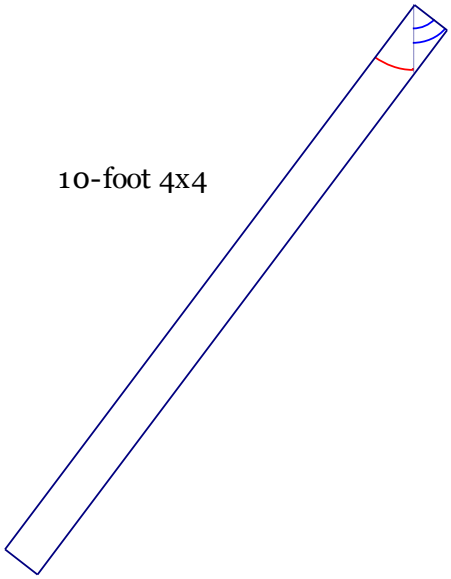
What I should have done to determine the angles of the cuts

8-foot tall triangle with 10-foot long legs, horizontal ground.

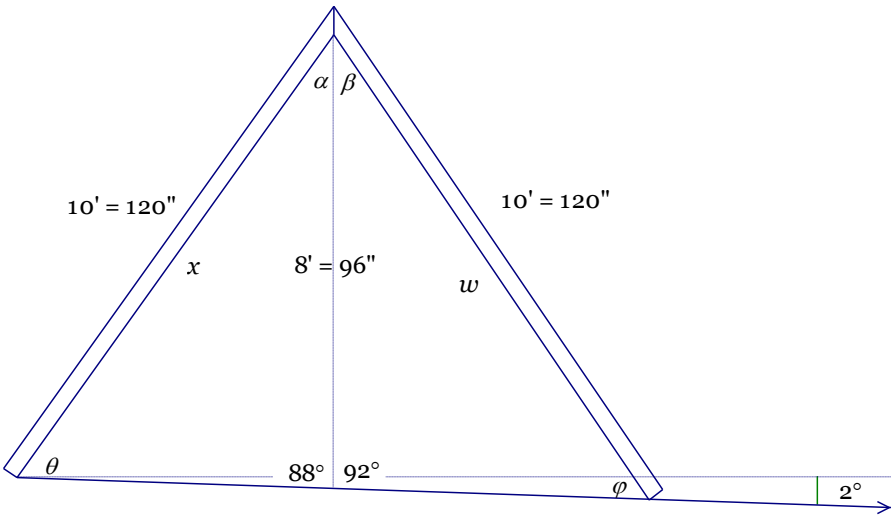




$$\cos x = \frac{8}{10} \rightarrow x = \cos^{-1}\frac{8}{10} \approx 37°$$

Keep 37 degrees or cut off 53 degrees. Done. Required knowledge, 10th grade math.

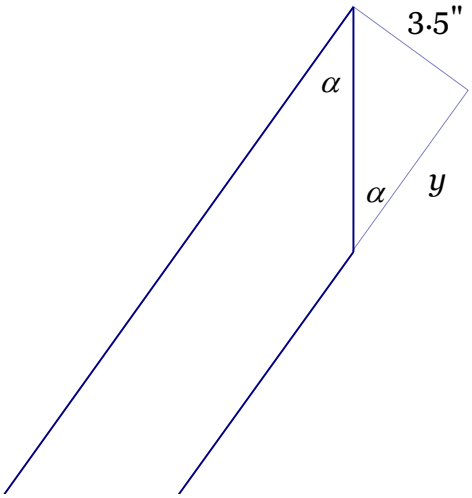
What I spent too long doing to determine the angles of the cuts



8-foot tall triangle with 10-foot long legs. The ground is not level, but my iPhone level told me that the slope was 2 degrees down from front to back, so I went with that. I decided to assume that the height of the ground did not vary significantly from the midpoint of the side of the tower to the point below the apex of the A.

Law of Sines: $\frac{\sin 88°}{x} = \frac{\sin\theta}{96} \rightarrow \theta = \sin^{-1}\left(\frac{96\sin 88°}{x}\right)$ And also, $\alpha = 92 - \theta$.

Here is a blown up part of the top end of the left 4x4 to show what I needed to cut off.



I knew the 3.5 inches from the dimensions of the board and that $x + y = 120$, the length of the post in inches. I used these two facts to fine the angle (α).

$$\tan\alpha = \frac{3.5}{y}$$

$$y = \frac{3.5}{\tan\left(92 - \sin^{-1}\left(\frac{96\sin 88°}{x}\right)\right)}$$

$$x + y = 120$$

$$y = 120 - x$$

(x, y) solved graphically yields $x \approx 115.1, y \approx 4.9$. Then $\alpha = \tan^{-1}\frac{3.5}{y} \approx 35.5°$.

Similar arguments find β.

Fun exercise for you. Find β. Let me know what you get!