Right Triangle } hyp / non-hyp } sine opp / cosine adj / tangent

$\frac{\sin A}{a} = \frac{\sin B}{b}$

2 letters same & angles ⇒ 3rd = 180° − −

$a = \sqrt{b^2 + c^2 - 2bc\cos A}$

3 letters # 1 → angle

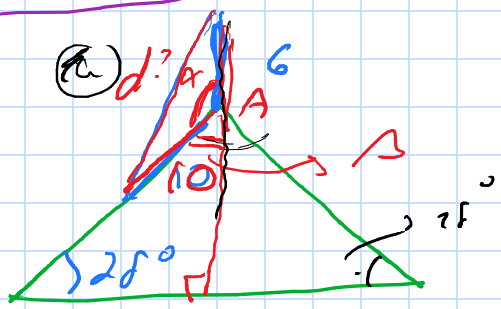
3 sides

$A = \cos^{-1}\frac{b^2 + c^2 - a^2}{2bc}$

#31

$\beta = 90° - 28°$
$= 62°$

$\alpha = 180° - 62°$
$= 118°$



$2\beta = 180° - 28° - 28°$

$\beta = 62°$

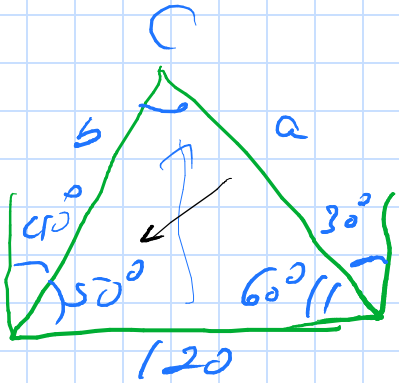
$d = \sqrt{10^2 + 6^2 - 2(10)(6)\cos 118°}$

$= \sqrt{136 - 120\cos 118°}$

$= 2\sqrt{34 - 30\cos 118°}$

37

a ? b ?



$$C = 180^\circ - 50^\circ - 60^\circ$$
$$= 70^\circ$$

$$\frac{a}{\sin 50^\circ} = \frac{120}{\sin 70^\circ}$$

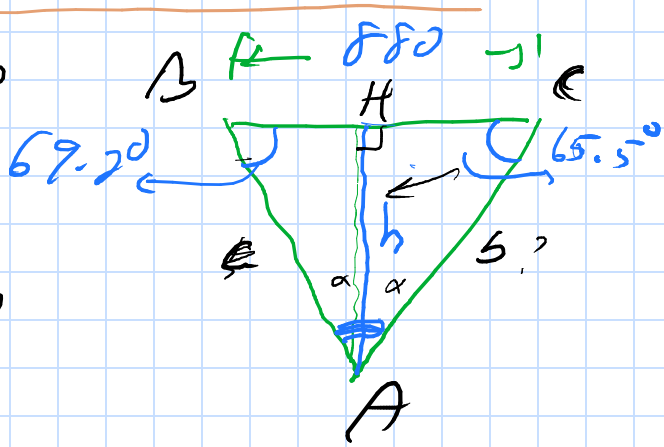
$$a = \frac{120 \sin 50^\circ}{\sin 70^\circ}$$

$$b = \frac{120 \sin 60^\circ}{\sin 70^\circ}$$

$\frac{\sqrt{3}}{2}$

$$= \frac{60\sqrt{3}}{\sin 70^\circ}$$

39



$$A = 180^\circ - 69.2^\circ - 65.5^\circ$$
$$= 45.3^\circ$$

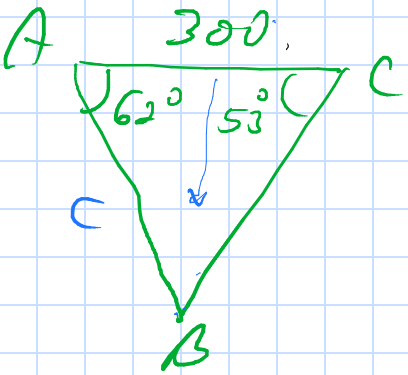
$$b = \frac{880 \sin 69.2^\circ}{\sin 45.3^\circ} \approx$$

△ AHC

$$\sin 65.5^\circ = \frac{h}{b}$$

$$h = \frac{880 \sin 69.2^\circ}{\sin 45.3^\circ} \cdot \sin 65.5^\circ$$

9) $AB = ?$ $\overline{AB} = |AB|$

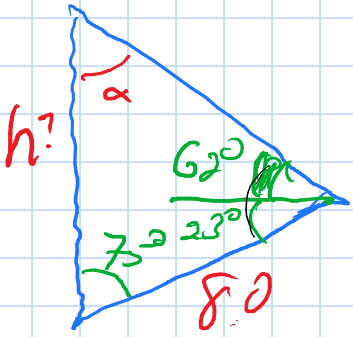


$B = 180^\circ - 62^\circ - 53^\circ$
$= 65^\circ$

$$c = \frac{300 \sin 53^\circ}{\sin 65^\circ}$$

$$\frac{c}{\sin C} = \frac{b}{\sin B}$$

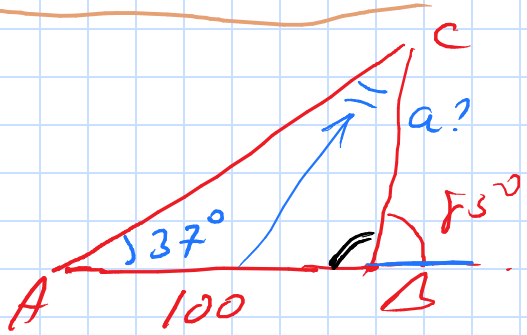
9b) $\alpha = 180^\circ - 75^\circ - 62^\circ - 23^\circ$
$= 20^\circ$



$$h = \frac{80 \sin 85^\circ}{\sin 20^\circ}$$

9c) $B = 180^\circ - 85^\circ$
$= 95^\circ$

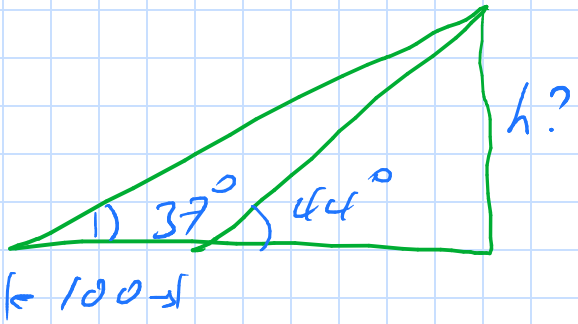
$C = 180^\circ - 95^\circ - 37^\circ$
$= 48^\circ$



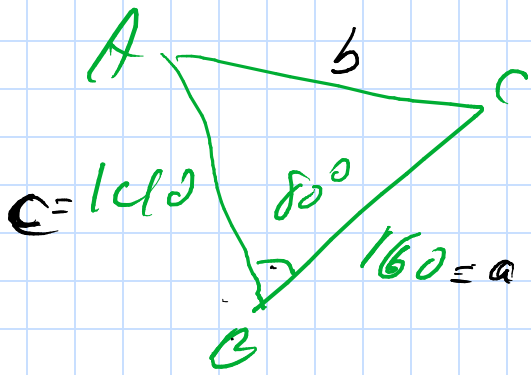
$$a = \frac{100 \sin 37^\circ}{\sin 48^\circ}$$

96

$$h = \frac{100 \tan 44^\circ \tan 37^\circ}{\tan 44^\circ - \tan 37^\circ}$$



97

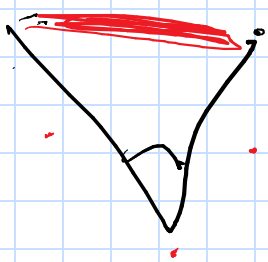


$$|AC| = \sqrt{(140)^2 + 160^2 - 2(140)(160)\cos 80^\circ}$$

$$= 10\sqrt{14^2 + 16^2 - 2(14)(16)\cos 80^\circ}$$

$$= 20\sqrt{49 + 64 - 112\cos 80^\circ}$$

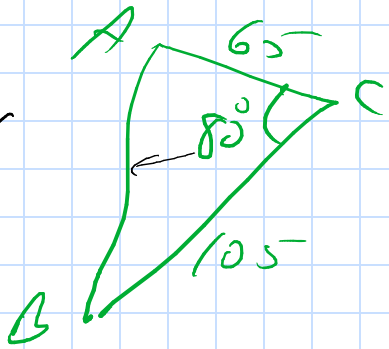
$$= 20\sqrt{113 - 112\cos 80^\circ}$$



law of cosine

99/

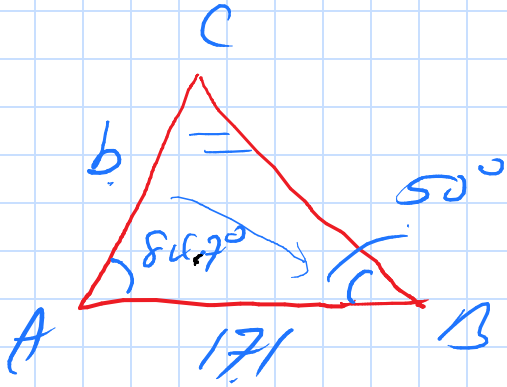
$$|AB| = \sqrt{65^2 + 105^2 - 2(65)(105)\cos 80^\circ}$$



110/

$$C = 180^\circ - 84.7^\circ - 50^\circ$$
$$= 45.3^\circ$$

$$b = \frac{171 \sin 50^\circ}{\sin 45.3^\circ}$$



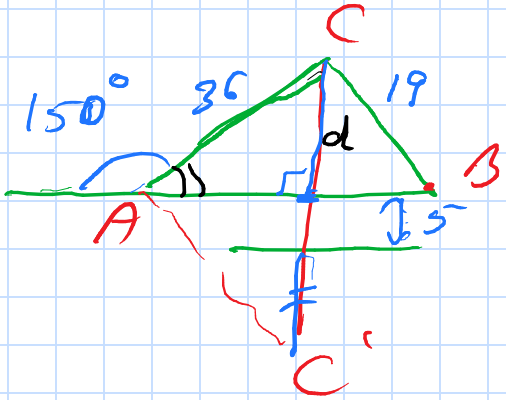
115/ $|CC'| = ?$

$\triangle ABC$: $A = 180^\circ - 150^\circ$
$= 30^\circ$

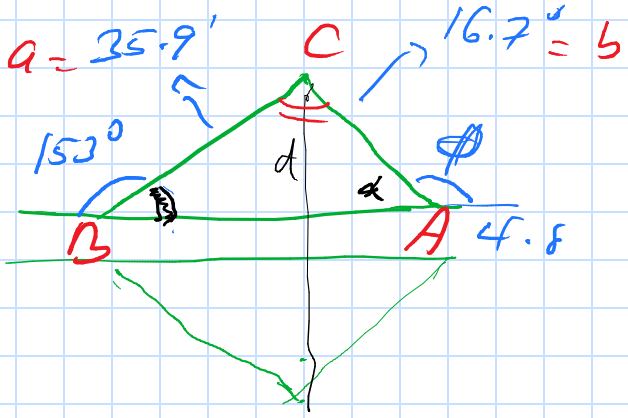
$$\sin 30^\circ = \frac{d}{36} = \frac{1}{2}$$

$$d = 18$$

$$|CC'| = 2(18) + 5$$
$$= 41 \text{ ft}$$



11.41 ϕ



$B = 180^\circ - 153^\circ$

$= 27^\circ$

$$\frac{\sin A}{35.9} = \frac{\sin 27^\circ}{16.7}$$

$$\sin A = \frac{35.9 \sin 27^\circ}{16.7}$$

$$A = \sin^{-1}\left(\frac{35.9 \sin 27^\circ}{16.7}\right)$$

$$\phi = 180^\circ - \sin^{-1}\left(\frac{35.9 \sin 27^\circ}{16.7}\right)$$

Area of $\triangle ABC$? $C = 180^\circ - 27^\circ - A$

$$\text{Area} = \frac{1}{2}(35.9)(16.7)\cos\left(153^\circ - \sin^{-1}\left(\frac{35.9 \sin 27^\circ}{16.7}\right)\right)$$

$\approx$ $\quad ft^2$

$\sin A = a$

$A = \sin^{-1} a$