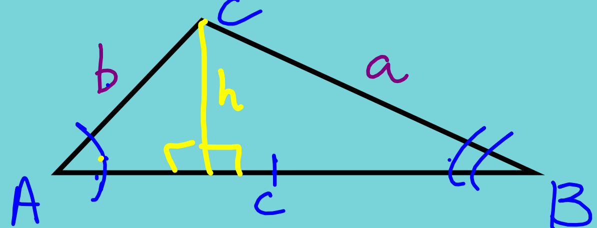
SOLVING OBLIQUE Δ'S & VECTORS

not a right Δ

Law of Sines



ASA
AAS

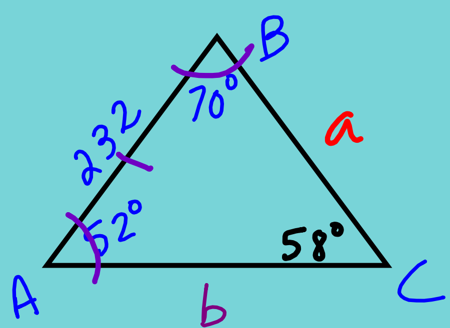
$\sin A = \frac{h}{b}$ $\quad$ $\sin B = \frac{h}{a}$

$b \sin A = h$ $\quad$ $a \sin B = h$

$b \sin A = a \sin B$

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

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



Find all missing parts.

$$C = 180^\circ - 122^\circ = 58^\circ$$

$$\cancel{\sin 52^\circ}\,\frac{a}{\cancel{\sin 52^\circ}} = \frac{232}{\sin 58^\circ}\cdot \sin 52^\circ$$

$$a \approx 216$$

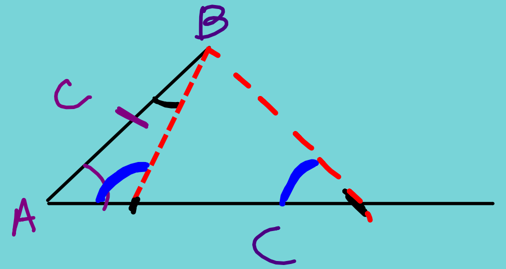
$$\frac{b}{\cancel{\sin 70^\circ}} = \frac{232}{\sin 58^\circ}\cdot \sin 70^\circ$$

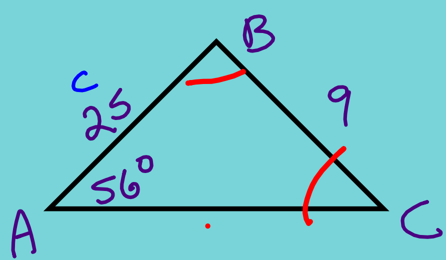
$$b = 257$$

Ambiguous Case of Law of Sines (SSA)

unclear, more than 1 possibility

No Δ | 1 Δ | 2 Δ



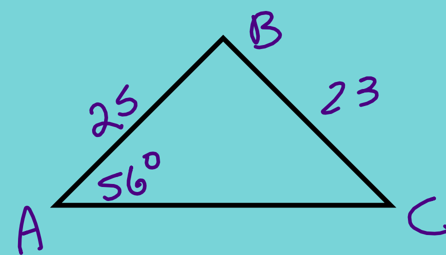


Find B.

$$\cancel{25}\cdot\frac{\sin C}{\cancel{25}}=\frac{\sin 56^\circ}{9}\cdot 25$$

$$\cancel{\sin C = 2.3}$$

No Δ



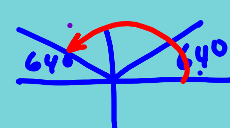
Find B.

$$\frac{\sin C}{\cancel{25}}=\frac{\sin 56^\circ}{23}\cdot 25$$

$$\sin C = 0.9011$$

$$\sin^{-1}(0.9011)=64.3^\circ$$

$$C = 64^\circ$$



$C=64^\circ$	$C'=180^\circ-64^\circ$ $=116^\circ$
$A=56^\circ$	$A=56^\circ$ $\}$ 172°
$B=60^\circ$	$B'=8^\circ$

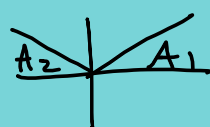
$B=60^\circ$ or 8°

To Check for 2nd Δ when SSA

1) Solve Law of Sines to get first angle (A_1)

must be calculated angle with Law of Sines

2) $A_2 = 180^\circ - A_1$



3) A_2 + Given angle $< 180^\circ$, then 2 Δ's

   A_2 + Given angle $\geq 180^\circ$, then no 2nd Δ

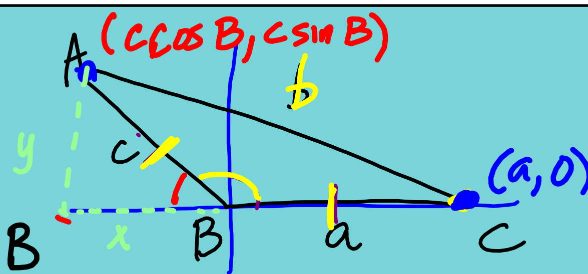
Law of Cosines

SAS, SSS

$$b^2 = a^2 + c^2 - 2ac\cos B$$

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

$$c^2 = a^2 + b^2 - 2ab\cos C$$



$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$x = r\cos\theta$$

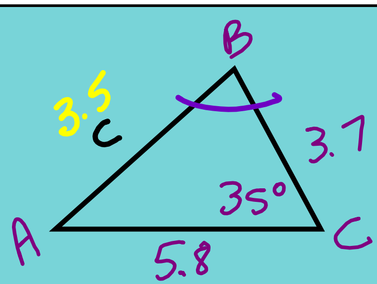
$$y = r\sin\theta$$

$$b = \sqrt{(c\cos B - a)^2 + (c\sin B - 0)^2}$$

$$b = \sqrt{\underline{c^2\cos^2 B} - 2ac\cos B + a^2 + \underline{c^2\sin^2 B}}$$

$$b = \sqrt{c^2(\cancel{\cos^2 B + \sin^2 B}^{\,1}) + a^2 - 2ac\cos B}$$

$$b^2 = a^2 + c^2 - 2ac\cos B$$



Find B.

SAS

$c^2 = a^2 + b^2 - 2ab\cos C$

$c^2 = 3.7^2 + 5.8^2 - 2(3.7)(5.8)\cos 35^\circ$

$c^2 = 12.17$

$\boxed{c = 3.5}$

After Law of Cos, must find the smallest remaining angle next.

$\frac{\sin A}{3.7} = \frac{\sin 35^\circ}{3.5}$

$A = 37^\circ$

$C = 35^\circ$

$B = 108^\circ$

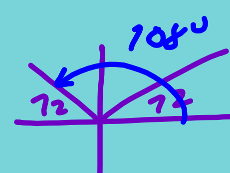
$\frac{\sin B}{5.8} = \frac{\sin 35^\circ}{3.5}$

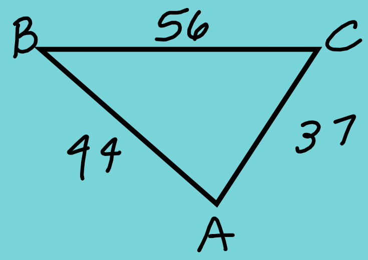
$\sin B \approx 0.95$

$\sin^{-1}(0.95) = 72^\circ$

$B = 72^\circ$

$A = 73^\circ$





Find C.

$$c^2 = a^2 + b^2 - 2ab\cos C$$

$$44^2 = 56^2 + 37^2 - 2(56)(37)\cos C$$

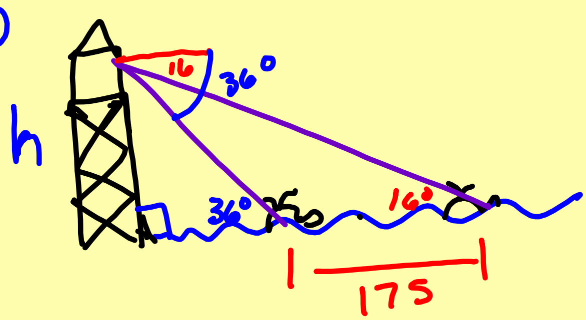
$$44^2 - 56^2 - 37^2 = -2(56)(37)\cos C$$

$$\frac{44^2 - 56^2 - 37^2}{-2(56)(37)} = \cos C$$

$$0.6199 = \cos C$$

$$\boxed{52^\circ = C}$$

#10



Cannot find the height directly. Will need to find a different side before you can solve for h.