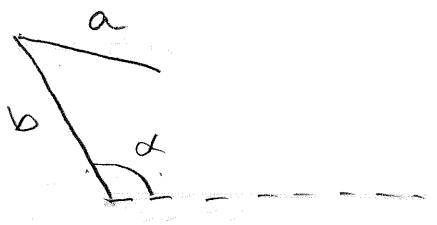
if α is obtuse

Case 1

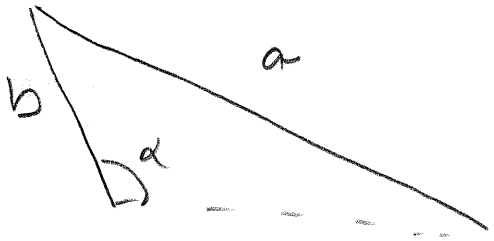


← doesn't Reach

No triangle

$a \leq b$

Case 2



Exactly one triangle

$a > b$

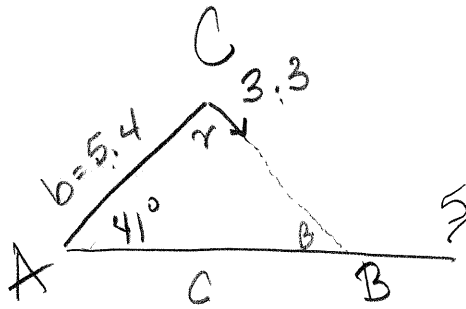
Example:

$\alpha = 41°$, $a = 3.3$, and $b = 5.4$

Solve the triangle: $\beta = ?$

$\gamma =$

$c =$



$$5.4 \cdot \frac{\sin\beta}{5.4} = \frac{\sin 41 \cdot 5.4}{3.3}$$

$$\sin\beta = \frac{(\sin 41°)\,5.4}{3.3}$$

$\sin\beta = 1.07$ ← Not possible

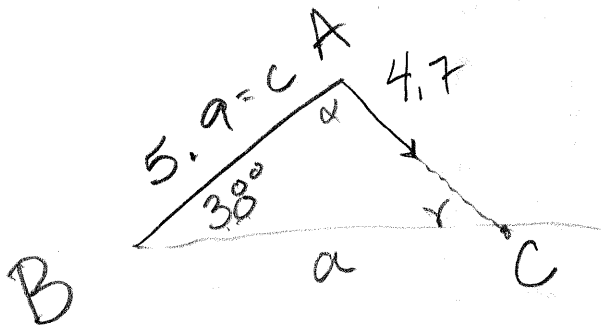
$\beta = \sin^{-1}(\quad)$

No triangle possible

Ex: $\beta = 38°$, $b = 4.7$, $c = 5.9$

Solve the triangle

$\alpha = ?$, $\gamma = ?$, $a =$



$$\frac{\sin\gamma}{5.9} = \frac{\sin 38}{4.7}$$

$\cdot 5.9$

$$\sin\gamma = \frac{(\sin 38)\,5.9}{4.7}$$

$$\sin\gamma = .77285$$

$$\gamma = 50.6°,\ 129.4°$$

Ans

Triangle 1

$\gamma = 50.6°$

$\alpha = 91.4°$

$a = 7.6318$

Triangle 2

$\gamma = 129.4°$

$\alpha = 12.6°$

$a = 1.6653$

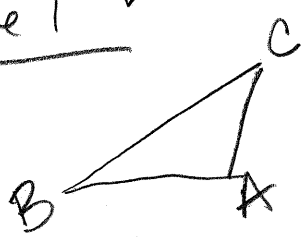
triangle 1 ✓

$\gamma = 50.6°$

$\beta = 38°$

$\alpha = 180° - (50.6 + 38)$

$= 91.4°$



$$\frac{a}{\sin 91.4} = \frac{4.7}{\sin 38}$$ ← b, ← sin β

$$a = \frac{4.7(\sin 91.4)}{\sin 38} = 7.6318$$

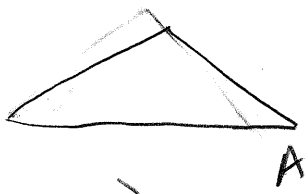
triangle 2 ✓

$\gamma = 129.4°$

$\beta = 38°$

$\alpha = 180 - (129.4 + 38)$

$= 12.6°$

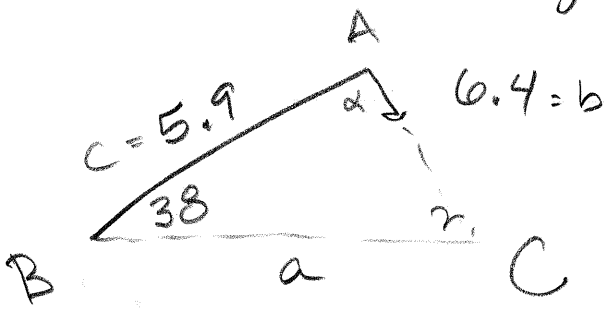


$$\frac{a}{\sin 12.6} = \frac{4.7}{\sin 38}$$

$$a = \frac{4.7 \sin 12.6}{\sin 38} = 1.6653$$

Ex: $B = 38°$, $b = 6.4$, $c = 5.9$

Solve the triangle: $\alpha = ?$, $a = ?$, $\gamma = ?$



$$5.9 \cdot \frac{\sin 38}{6.4} = \frac{\sin \gamma}{5.9} \cdot 5.9$$

$$\frac{5.9 \sin 38}{6.4} = \sin \gamma$$

$$.5676 = \sin \gamma$$

$$34.6 = \gamma$$

Ans

$\alpha = 107.4°$

$\gamma = 34.6°$

$a = 9.9$

Triangle 1

$\gamma = 34.6°$

$B = 38°$

$\alpha = 180° - (34.6° + 38°)$

$= 107.4$

~~Triangle 2~~

~~$\gamma = 145.4$~~

~~$B = 38°$~~

~~$a = 180 - (145.4 + 38)$~~

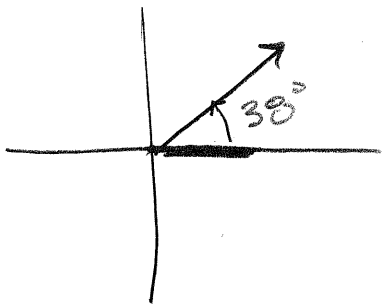
~~$= -3.4$~~

$$\sin 107.4 \cdot \frac{a}{\sin 107.4} = \frac{6.4}{\sin 38} \cdot \sin 107.4$$

$$a = \frac{6.4 \sin 107.4}{\sin 38} = \frac{19.49}{9.9}$$

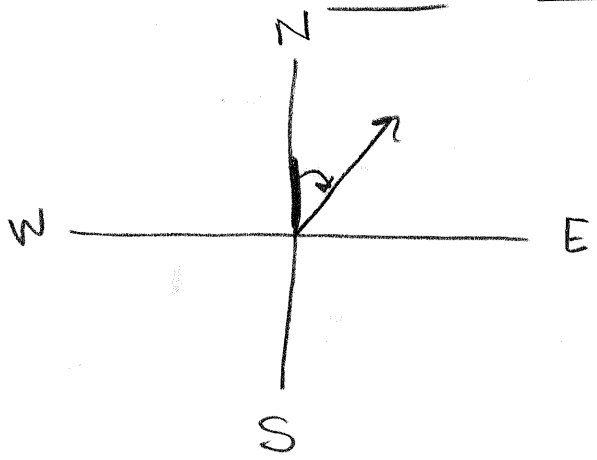
In Math

38°



Bearing:

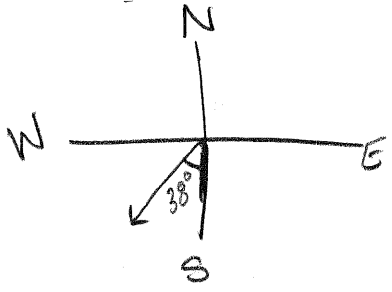
1st a positive angle between 0 and 360° measured clockwise from due North



Bearing of 38°

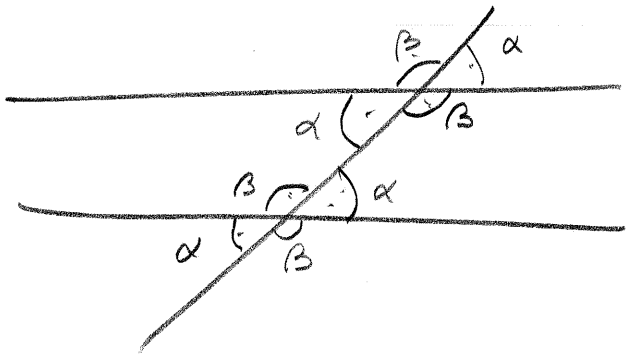
2nd Start at North line or South line and move the acute angle in the specified Direction

Ex: S 38° W



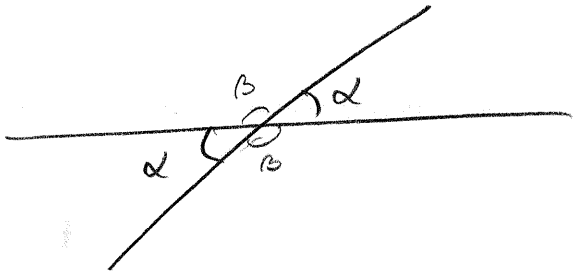
Geometry Property

* Z-Prop (Alternate interior Angles



← only if // lines

* Vertical Angles



←