

The Ambiguous Case of the Law of Sines

Ambiguous Case Slide Show.ppt



am·big·u·ous  [am-big-yoo-uh s]  [Show IPA](#)

adjective

1. open to or having several possible meanings or interpretations; equivocal: *an ambiguous answer.*
2. *Linguistics* . (of an expression) exhibiting constructional homonymity; having two or more structural descriptions, as the sequence *Flying planes can be dangerous.*
3. of doubtful or uncertain nature; difficult to comprehend, distinguish, or classify: *a rock of ambiguous character.*
4. lacking clearness or definiteness; obscure; indistinct: *an ambiguous shape; an ambiguous future.*

Hw ???

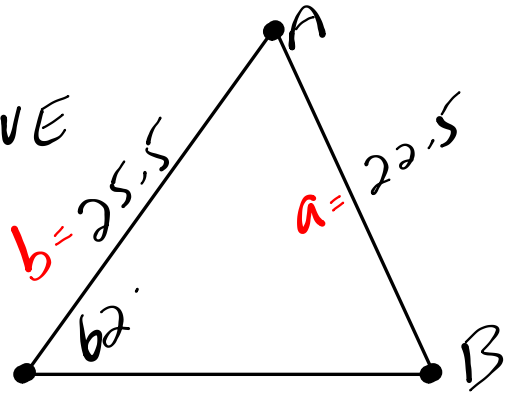
5d)

$$b = 25.5$$

$$c = 22.5$$

$$\angle C = 62^\circ$$

SOLVE



① Criteria for Ambiguous Case

- SSA ✓
- given angle is acute ✓
- $a < b$ ✓

② Calculate altitude (alt = $b \sin A$)

$$\text{alt} = 25.5 \sin 62^\circ$$

$$\text{alt} = 22.52$$

③ Cases...

- 1) $a < \text{alt}$
- 2) $a = \text{alt}$
- 3) $a > \text{alt}$

no solution

1 right triangle

* ambiguous \rightarrow 2 solutions

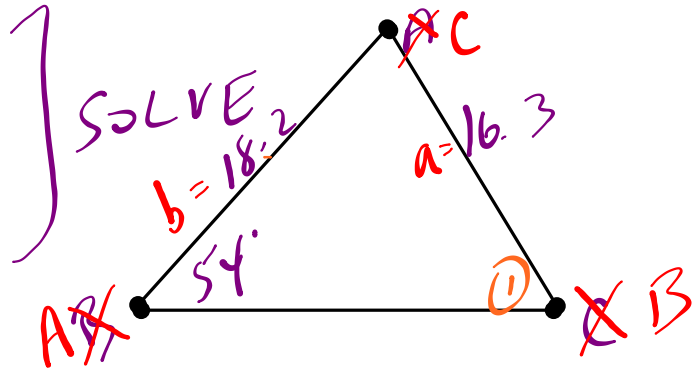
① Calc \Rightarrow acute

* ② $180 - \theta \Rightarrow$ obtuse

a vs alt

$$22.5 < 22.52$$

5c) $b = 16.3$
 $c = 18.2$
 $\angle B = 54^\circ$



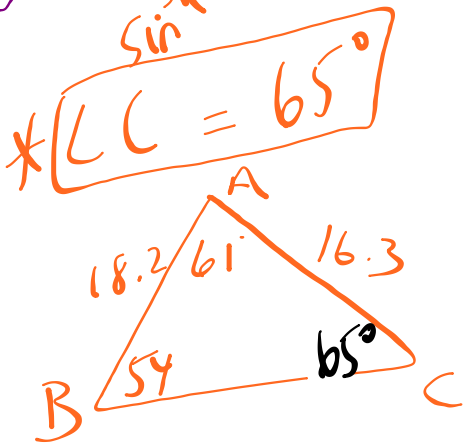
- SSA ✓
- acute ✓
- $a < b$ ✓

alt = $18.2 \sin 54^\circ$
 alt = 14.72

1) $a < \text{alt}$
 2) $a = \text{alt}$
 3) $a > \text{alt}$
 *ambiguous

$$\frac{18.2 \sin C}{18.2} = \frac{18.2 \sin 54^\circ}{16.3}$$

$$\sin C = (0.9033)$$



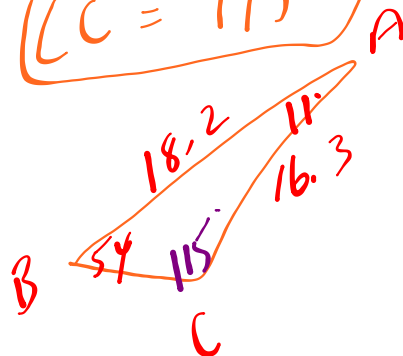
$\angle A = 61^\circ$

$$\frac{a \sin 61^\circ}{\sin 61^\circ} = \frac{16.3 \sin 61^\circ}{\sin 54^\circ}$$

$a = 17.6$

OR

$\angle C = 180^\circ - 65^\circ$
 $\angle C = 115^\circ$



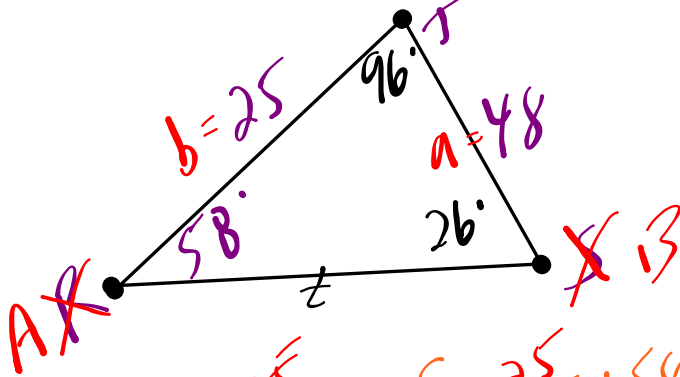
$\angle A = 11^\circ$

$$\frac{a \sin 11^\circ}{\sin 11^\circ} = \frac{16.3 \sin 11^\circ}{\sin 54^\circ}$$

$a = 3.8$

Warm Up

Given $\triangle RST$ has angle $R = 58^\circ$, $r = 48$ and $s = 25$.
Solve the triangle, if there is more than one possible, solve both!!



-SSA ✓
-acute ✓
-a < b ✓
1 solution

$\angle T = 96^\circ$

$$\frac{25}{\sin S} = \frac{48}{\sin 58^\circ}$$

$$\sin S = (0.4417)$$

$\angle S = 26^\circ$

$$t^2 = 25^2 + 48^2 - 2(25)(48)\cos 58^\circ$$

$t^2 =$ $25^2 + 48^2 - 2 * 25 * 48 \cos(58)$ 1657.193766 $\sqrt{\text{Ans}}$ 40.70864485
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$$\frac{t}{\sin 96^\circ} = \frac{48}{\sin 58^\circ}$$

$t = 56.3$

HOMEWORK...

 Worksheet - Ambiguous Case.pdf #6

Page 184: #4, 5, 6

Attachments

Ambiguous Case Slide Show.ppt

Worksheet - Ambiguous Case.pdf