

The Ambiguous Case of the Law of Sines

Ambiguous Case Slide Show.ppt



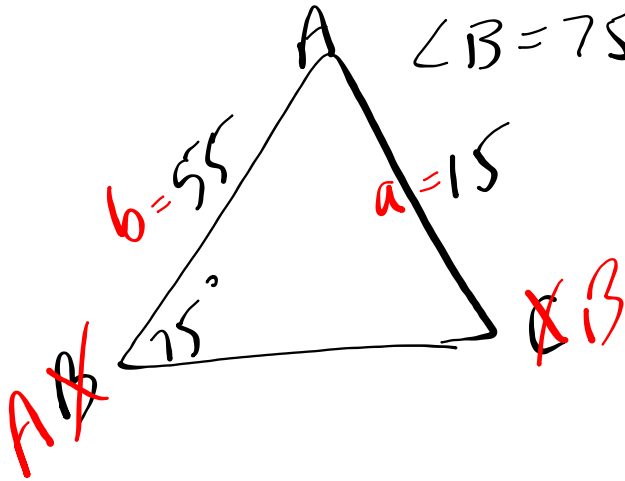
am·big·u·ous  [am-big-yoo-uh s]  [Show IPA](#)

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 ???
 (5b)

$b = 15$
 $c = 55$
 $\angle B = 75^\circ$



a vs alt
 $15 < 53.1$

Solve

① Criteria for ambiguous

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

② Calculate height

$alt = b \sin A$

$alt = 55 \sin 75^\circ$
 $alt = 53.1$

③ Cases...

$a < alt$ No solution

$a = alt$ 1 Right Δ

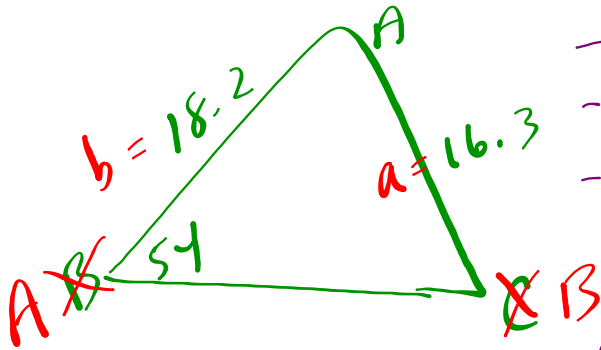
$a > alt$ *ambiguous
 2 solutions

- 1) Calc \rightarrow acute
- * 2) $180 - \theta \rightarrow$ obtuse

5c) $b = 16.3$

$c = 18.2$

$\angle B = 54^\circ$



- SSA ✓
- acute ✓
- $a < b$ ✓

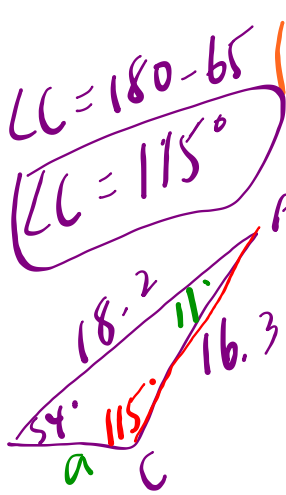
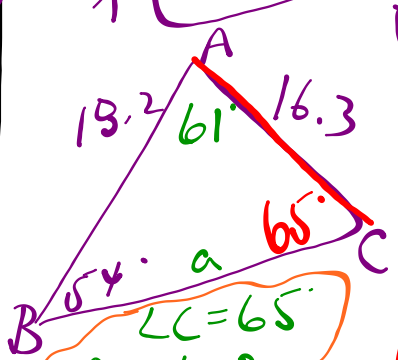
$\frac{\sin C}{18.2} = \frac{\sin 54}{16.3}$

alt = $18.2 \sin 54^\circ$
alt = 14.7

$\sin C = 0.9033$

$\angle C = 65^\circ$

a vs alt \neq ambiguous
 $16.3 > 14.7$ 2 solutions



$\angle C = 115^\circ$
 $\angle A = 11^\circ$

$\frac{a \sin B}{\sin 61} = \frac{16.3}{\sin 54}$

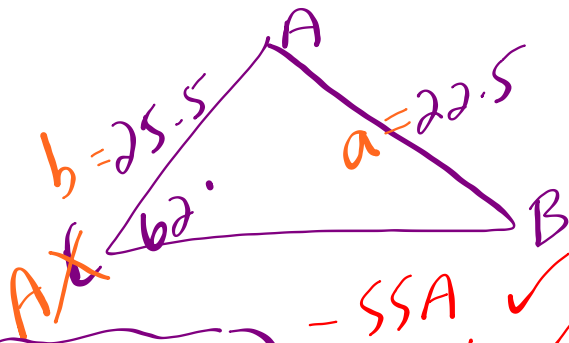
$\frac{a \sin 11}{\sin 11} = \frac{16.3 \sin 11}{\sin 54}$

$a = 17.6$

$a = 3.8$

5d)

$$\left. \begin{aligned} b &= 25.5 \\ c &= 22.5 \\ \angle C &= 62^\circ \end{aligned} \right\}$$



No Solution

- SSA ✓
- acute ✓
- $a < b$ ✓

$$\begin{aligned} \text{alt} &= 25.5 \sin 62^\circ \\ \text{alt} &= 22.52 \end{aligned}$$

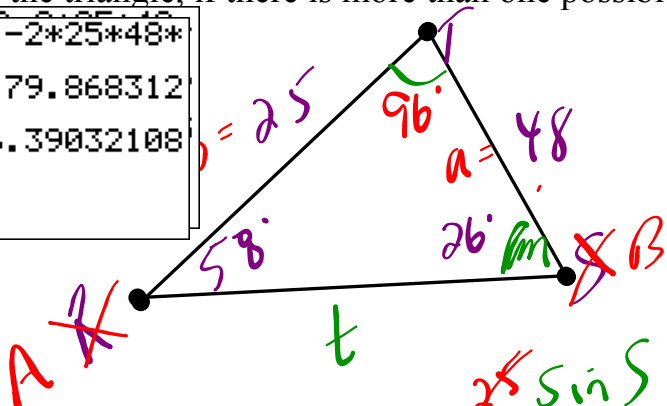
$$\begin{aligned} a &\text{ vs alt} \\ 22.5 &< 22.52 \end{aligned}$$

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!!

```

25^2+48^2-2*25*48*
cos(96)
3179.868312
√(Ans)
56.39032108
    
```



SSA ✓
acute ✓
 $a < b$ ✓
1 solution

$$\frac{t \sin 96^\circ}{\sin 96^\circ} = \frac{48 \sin 96^\circ}{\sin 58^\circ}$$

$$t = 56.3$$

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

$$\sin^{-1} \sin S = (0.4417)$$

$$\sin^{-1} \dots$$

$$S = 26^\circ$$

$$T = 96^\circ$$

HOMEWORK...

 Worksheet - Ambiguous Case.pdf #6

Page 184: #4, 5, 6

Attachments

Ambiguous Case Slide Show.ppt

Worksheet - Ambiguous Case.pdf