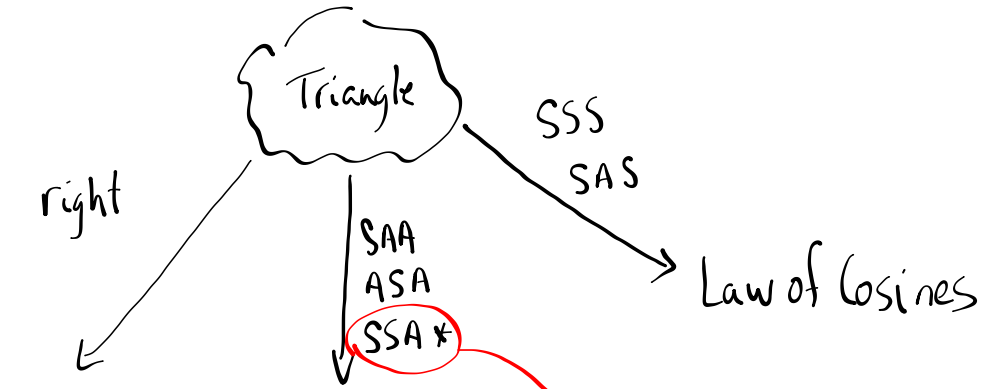


Test

If $h < a < b$

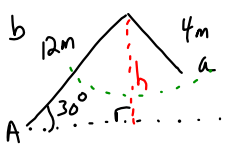
Then you could have 2 Triangles.

§4-3 The Ambiguous Case of the Law of Sines

Example 1 (p177)

Given each SSA situation for ΔABC, determine how many triangles are possible.

a) $\measuredangle A = 30^\circ$, $a = 4m$, $b = 12m$



Find the height:

$\sin\theta = \frac{opp}{hyp}$

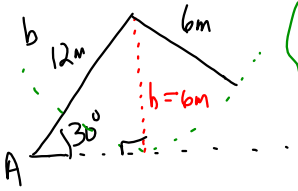
$\sin 30^\circ = \frac{h}{12m}$

$h = 12m \sin 30^\circ$

$h = 6m$

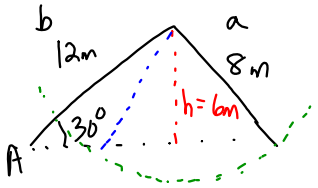
No triangle can be formed

b) $\measuredangle A = 30^\circ$, $a = 6m$, $b = 12m$



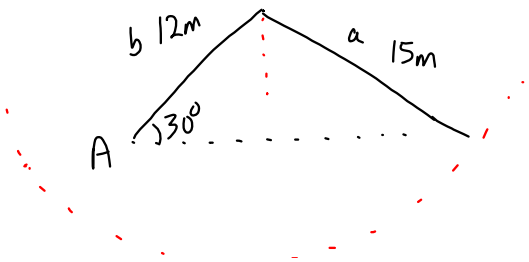
Only 1 triangle can be formed

c) $\measuredangle A = 30^\circ$, $a = 8m$, $b = 12m$



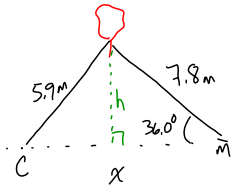
Two triangles can be formed

d) $\measuredangle A = 30^\circ$, $a = 15m$, $b = 12m$



Only 1 triangle can be formed.

Example 2 (p178)



Find the height:

$\sin\theta = \frac{opp}{hyp}$

$\sin 36.0^\circ = \frac{h}{7.8m}$

$h = 4.5847.....$

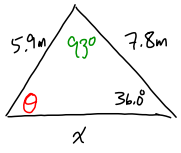
SSA → caution!

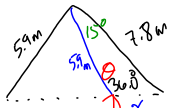
No Δ?
1 Δ?
2 Δ?

Since Carl's rope is 5.9m:

$7.8m > 5.9m > h$

There are two possible triangles





$\frac{\sin\theta}{7.8} = \frac{\sin 36.0}{5.9}$

$\sin\theta = \frac{7.8\sin 36.0}{5.9}$

$\theta = 51.0^\circ$

Your calculator only gives you the primary angle.

$180^\circ - 51.0^\circ = 129.0^\circ$

secondary angle

$\frac{5.9}{\sin 36.0^\circ} = \frac{x}{\sin 93^\circ}$

$x = \frac{5.9\sin 93^\circ}{\sin 36^\circ}$

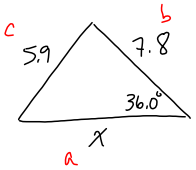
$x = 10.0m$

$\frac{5.9}{\sin 36.0^\circ} = \frac{x}{\sin 15^\circ}$

$x = \frac{5.9\sin 15^\circ}{\sin 36.0^\circ}$

$x = 2.6m$

Alternatively



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

$(5.9)^2 = x^2 + (7.8)^2 - 2(x)(7.8)\cos 36.0^\circ$

$34.81 = x^2 + 60.84 - 12.6x$

① put in standard form ⇒ solve with Q formula

OR

② Graph LS and RS and find intersection points.

If there is no solution ⇒ no Δ
1 solution ⇒ 1 Δ
2 solutions ⇒ 2 Δ

solutions must be positive

TO DO

① Read over summary (p182)

② p183/4, 5, 6, 8–11 (12 + 13)