6.3 THE AMBIGUOUS CASE

ESSENTIAL QUESTION:

What type of oblique triangles have no solutions or multiple solutions?

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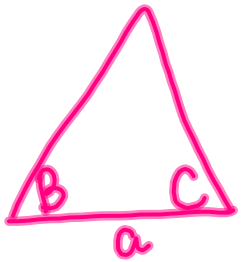
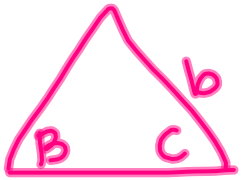
$c^2 = a^2 + b^2 - 2ab\cos C$

Law of sines

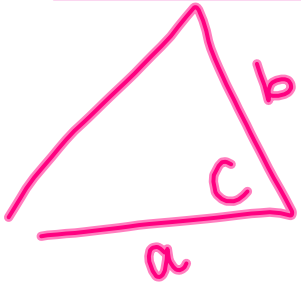


ASA

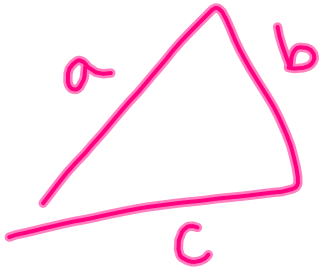


AAS

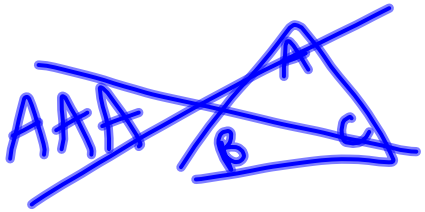
Law of cosines

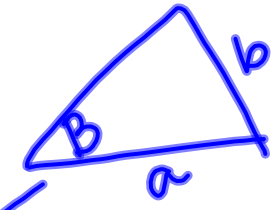


SAS



SSS





SSA

Abiguous case:

Angle is NOT between 2 sides

6.3 THE AMBIGUOUS CASE

ESSENTIAL QUESTION: What type of oblique triangles have no solutions or multiple solutions?

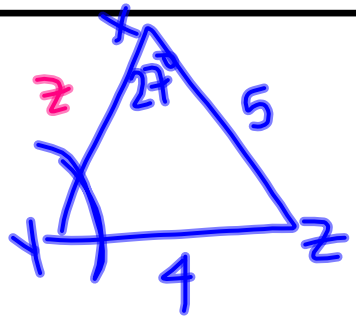
ex.

m<X = 27°

y = 5

x= 4

Solve for m<Y



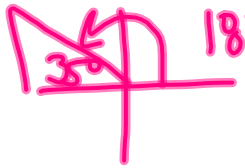
Law of Sines

$$\frac{\sin Y}{5} = \frac{\sin 27}{4}$$

$$\frac{5\sin 27}{4} = \frac{4\sin Y}{4}$$

$$\sin^{-1}(.567) = m\angle Y$$

35°



180−35

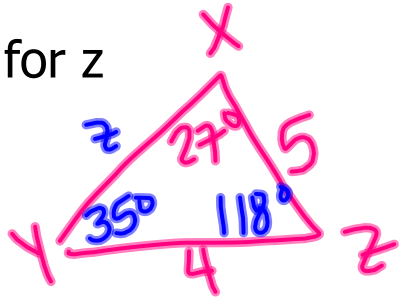
145°

√ ±

35° or 145°

Solve for z

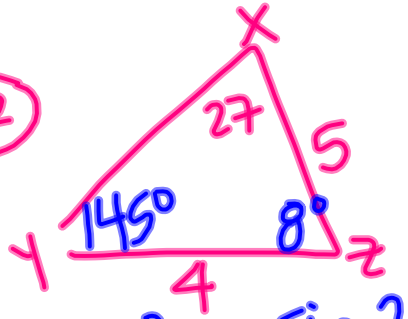
1



$$\frac{\sin 118}{z} = \frac{\sin 27}{4}$$

$$\boxed{z = 7.78 \text{ OR } z = 1.23}$$

2



$$\frac{\sin 8}{z} = \frac{\sin 27}{4}$$

6.3 THE AMBIGUOUS CASE

ESSENTIAL QUESTION: What type of oblique triangles have no solutions or multiple solutions?

ONE SOLUTION

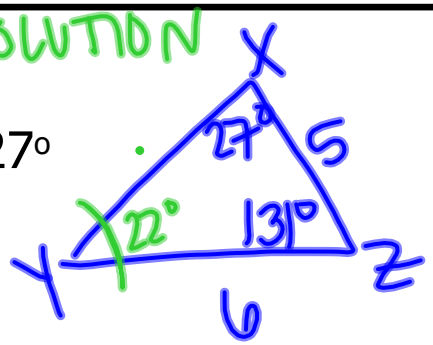
ex.

m<X = 27°

y=5

x=6

Solve for z



$$\frac{\sin 27}{6} = \frac{\sin Y}{5}$$

$$\sin^{-1}\left(\frac{5\sin 27}{6}\right) = 22^\circ$$

② $180 - 22 = 158$

$158 + 27 \not> 180$

$$\frac{\sin 27}{6} = \frac{\sin 131}{z}$$

$$\boxed{z = 9.97}$$

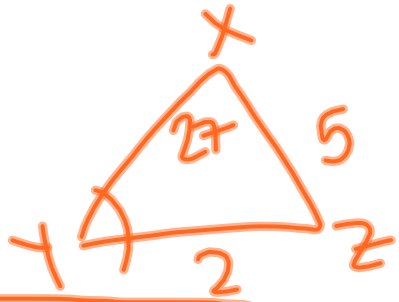
ex.

m<X=27°

y=5

x=2

Solve for z



$$\frac{\sin Y}{5} = \frac{\sin 27}{2}$$

$\sin Y = 1.13\ldots$

$\sin > 1$

$\boxed{\text{NO SOLUTION!}}$