# Algebra II

## 12-7

## Law of Sines

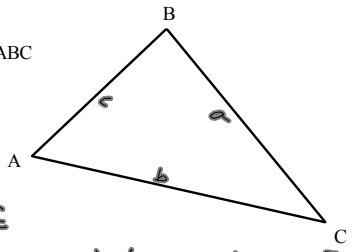
Law of Sines -

Given a general triangle $\Delta ABC$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

or

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$




Works two types of triangles:

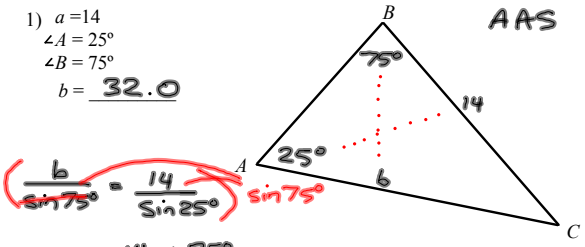
AAS (ASA)

ASS

Find the indicated part of $\Delta ABC$ to three significant digits or to the nearest tenth of a degree. If there are two solutions, give both. (pg 588)

1) $a = 14$
$\angle A = 25°$
$\angle B = 75°$
$b =$ 32.0

AAS



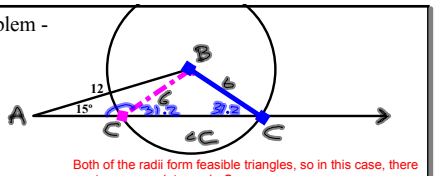

$\left(\frac{b}{\sin 75°} = \frac{14}{\sin 25°}\right) \sin 75°$

$b = \frac{14 \sin 75°}{\sin 25°}$

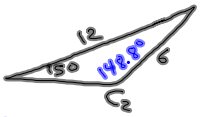
$b = 31.998$

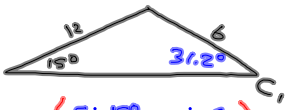
The Angle Side Side problem -

$a = 6$
$c = 12$
$A = 15°$
$\angle C =$ 31.2° or 148.8°




Both of the radii form feasible triangles, so in this case, there are two appropriate angle $C$ answers.



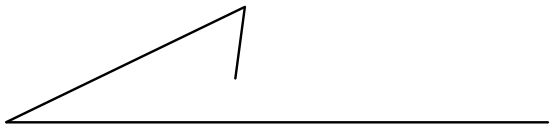




$C_2 = 180 - C_1$

$\left(\frac{\sin 15°}{6} = \frac{\sin C_1}{12}\right) 12$

$2 \sin 15° = \sin C_1$

$\sin^{-1}(.517\ldots) = C_1 = 31.17$



The ASS problem -

If the side opposite is shorter than the side adjacent,

a) No Solution (calculator error)
b) One Solution (right angle)
c) Two Solutions (calculator gives one, you find the other)

Pg 588

1-12 all

Pg 589

1-12 all (wp)