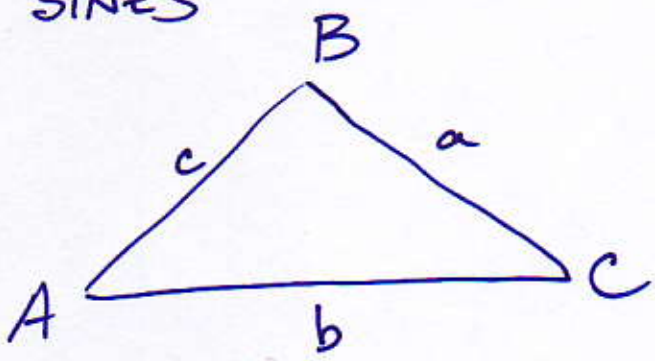
# SEC 4.1 LAW OF SINES

FOR <u>ANY</u> TRIANGLE

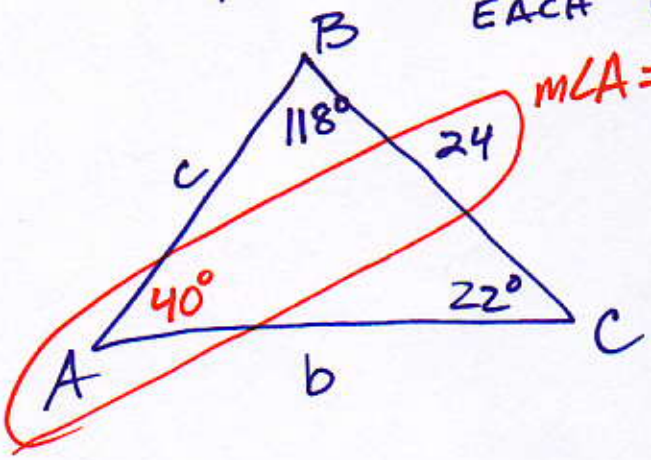



1. LAW OF SINES

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

2. WHEN TO USE THE LAW OF SINES?

IF THERE IS A GIVEN ANGLE AND GIVEN SIDE THAT ARE ACROSS FROM EACH OTHER.




$m\angle A = 180 - 118 - 22 = 40°$

IF GIVEN AAS OR ASA

3. SOLVE THE TRIANGLE: FIND ALL MISSING ANGLES AND SIDES.

$\boxed{m\angle A = 40°}$

$$\frac{c \sin 40}{24} = \frac{24 \sin 22}{\sin 40}$$

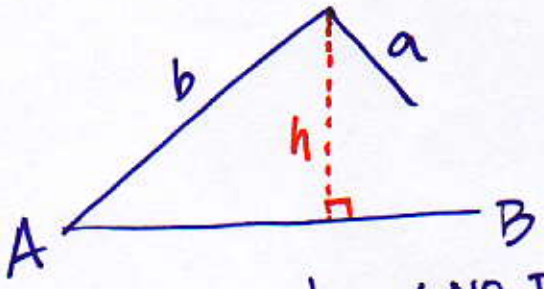
$\boxed{c = 14}$

$$\frac{b \sin 40}{24} = \frac{24 \sin 118}{\sin 40}$$

$\boxed{b = 33}$

# 4. SSA (AMBIGUOUS CASE)

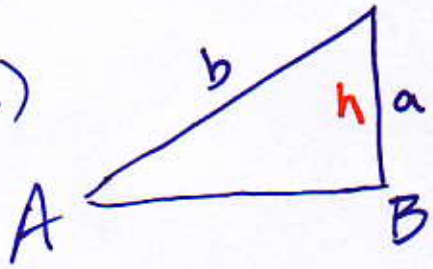
1)




$h = b \cdot \sin A$

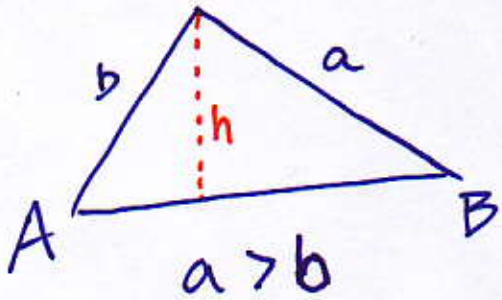
$a < h$ (NO TRIANGLE)

2)



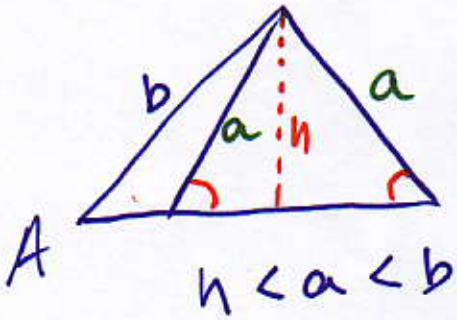

$a = h$ (ONE TRIANGLE) RIGHT $\triangle$.

3)




$a > b$ (ONE TRIANGLE)

4)




$h < a < b$ (TWO TRIANGLES)

SEC. PROB #17

17. $\angle A = 30°$
$a = 1.0$
$b = 2.4$

A
S
S

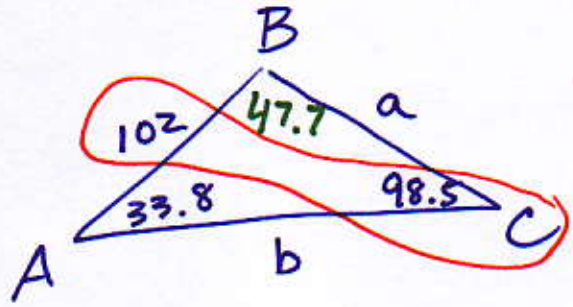
AMBIGUOUS CASE

$h = b \sin A$

IF $a < h$ THEN NO TRIANGLE EXISTS

$1.0 < 1.2$
$a < h$

9. $\angle A = 33.8°$ A
$\angle C = 98.5°$ A
$c = 102$ S




$\angle B = 180 - 33.8 - 98.5$

$\angle B = 47.7$

$$\frac{a \sin 98.5}{102} = \frac{102 \sin 33.8}{a \sin 98.5}$$

$a = 57.4$

$$\frac{102 \sin 47.7}{\sin 98.5} = \frac{b \sin 98.5}{102}$$

$b = 76.3$