LAW OF SINES

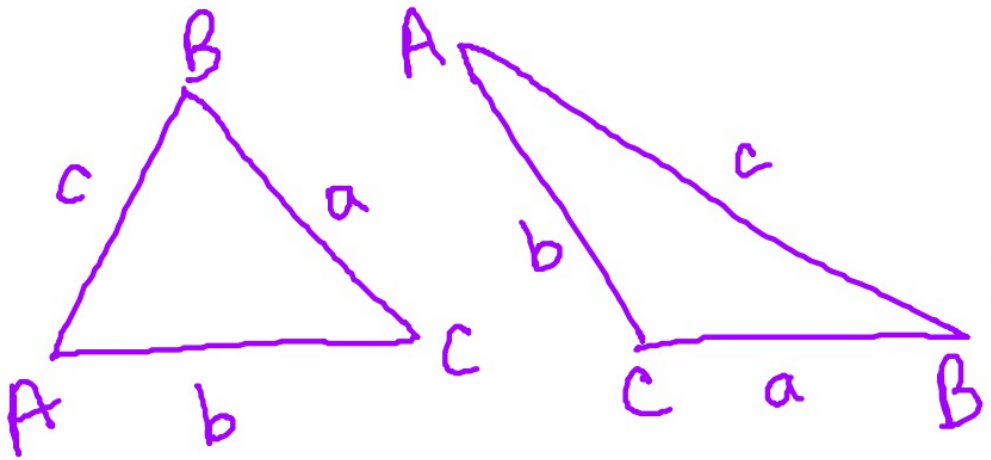
Section 6.1

LAW OF SINES

- Used to solve for missing parts of a non-right triangle

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

- Show triangles



GIVEN 2 ANGLES, 1 SIDE

1.) $\angle B = 28.7°$

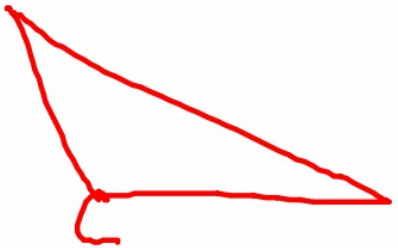
$\angle C = 102.3°$

$b = 27.4$

$\angle A = 49°$

$a = 43.06$

$c = 55.75$



$$\frac{\sin A}{a}$$

$$\frac{\sin 49°}{a}$$

$$49 = a \cdot \sin 28.7$$

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

$$\frac{\sin 28.7}{27.4} = \frac{\sin 102.3}{c}$$

$$27.4 \cdot \sin 102.3 = c \cdot \sin 28.7$$

GIVEN 2 ANGLES, 1 SIDE

2.) $\angle A = 43°$

$\angle B = 98°$

$c = 20$

$\angle C = 39°$

$a = 21.67$

$b = 31.47$

$= \frac{\sin A}{a}$

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

$= \frac{\sin 43}{a}$

$\frac{\sin 39}{20} = \frac{\sin 98}{b}$

$n43 = a \cdot \sin 39$

$20 \cdot \sin 98 = b \cdot \sin 39$

GIVEN 1 ANGLES, 2 SIDES

- Pg 432- read the examples in the box
- Given $\measuredangle A, a, b$
  - If a > b ⟶ 1 solution
  - If h < a< b ⟶ 2 solutions
    - h = b · sin A
  - Any other ⟶ No solution

GIVEN 1 ANGLES, 2 SIDES

1.) $\angle A = 42°$ $\quad \angle B = 21.41°$

$a = 22$ $\quad \angle C = 116.59°$

$b = 12$ $\quad c = 29.40$

Since "a" is > "b" → 1 solution

$\frac{\sin B}{b} = \frac{\sin B}{12}$

$12 = \frac{22 \cdot \sin B}{22}$

22 $\quad$ 12

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

$\sin B = \sin B$

$\angle B = 21.41°$

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

$\frac{\sin 42}{22} = \frac{\sin 116.59}{c}$

GIVEN 1 ANGLES, 2 SIDES

2.) $\angle A = 85°$

$a = 15$

$b = 25$

$\angle B =$

$\angle C =$

$c =$

$$\frac{}{} = \frac{\sin B}{b}$$

$$\frac{85}{} = \frac{\sin B}{25}$$

$$\frac{5 \cdot \sin 85}{15} = \frac{15 \cdot \sin B}{15}$$

No Solution

GIVEN 1 ANGLES, 2 SIDES

3.) $\angle A = 20.5°$

$a = 12$

$b = 31$

Supplementary 180°

$\angle B = 64.78°$	$\angle B' = 115.22°$
$\angle C = 94.72°$	$\angle C' = 44.28°$
$C = 34.15$	$C' = 23.92$

$$\frac{\sin 20.5}{12} = \frac{\sin B}{31}$$

$$\frac{\sin 20.5}{12} = \frac{\sin 94.72}{C}$$

$$\frac{\sin 20.5}{12} = \frac{\sin 44.28}{C'}$$

CLASSWORK:

Pg 436# 1-6, 25, 35

9, 15, 17

HOMEWORK:

- Pg 436 # 9, 15, 17, 19, 21, 23