Warm-Up

Solve each equation.

1) $\begin{bmatrix} -34 & -10 \end{bmatrix} = 3Y - \begin{bmatrix} 7 & -8 \end{bmatrix}$

2) $\begin{bmatrix} 13 & 4 \\ -46 & -25 \end{bmatrix} = \begin{bmatrix} 2 & -1 \\ -4 & 0 \end{bmatrix} B - \begin{bmatrix} -2 & 0 \\ 2 & 5 \end{bmatrix}$

Warm-Up

Solve each equation.

1) $\begin{bmatrix} -34 & -10 \end{bmatrix} = 3Y - \begin{bmatrix} 7 & -8 \end{bmatrix}$

$\begin{bmatrix} -9 & -6 \end{bmatrix}$

2) $\begin{bmatrix} 13 & 4 \\ -46 & -25 \end{bmatrix} = \begin{bmatrix} 2 & -1 \\ -4 & 0 \end{bmatrix} B - \begin{bmatrix} -2 & 0 \\ 2 & 5 \end{bmatrix}$

$\begin{bmatrix} 11 & 5 \\ 11 & 6 \end{bmatrix}$

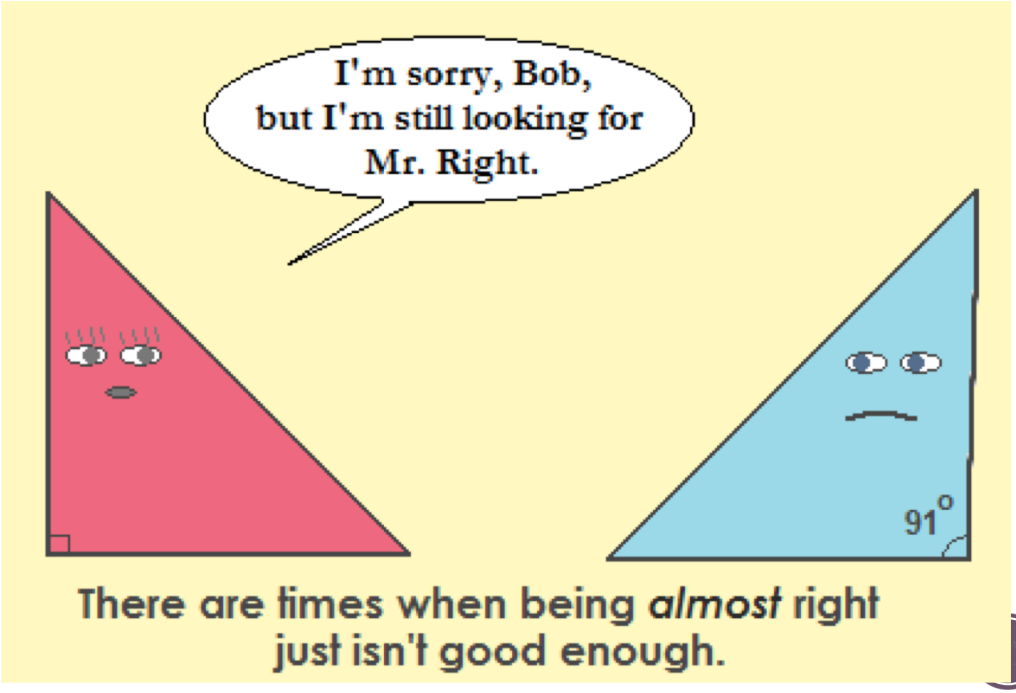
The Law of Sines

9-3: Use the law of sines to find unknown parts of a triangle.

The Law of Sines

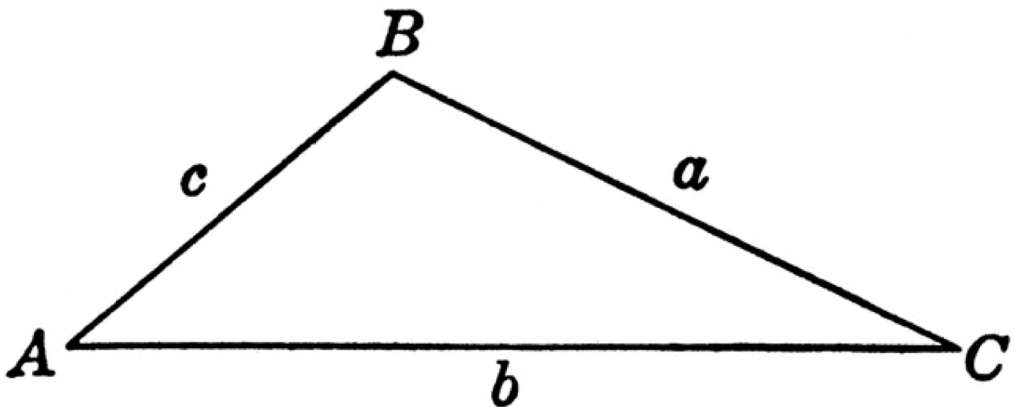
- When you have a triangle that is NOT a right triangle, you cannot use SOH CAH TOA to find missing measurements.

- One option you have is to use the Law of Sines.



The Law of Sines

$$\text{In } \Delta ABC, \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$



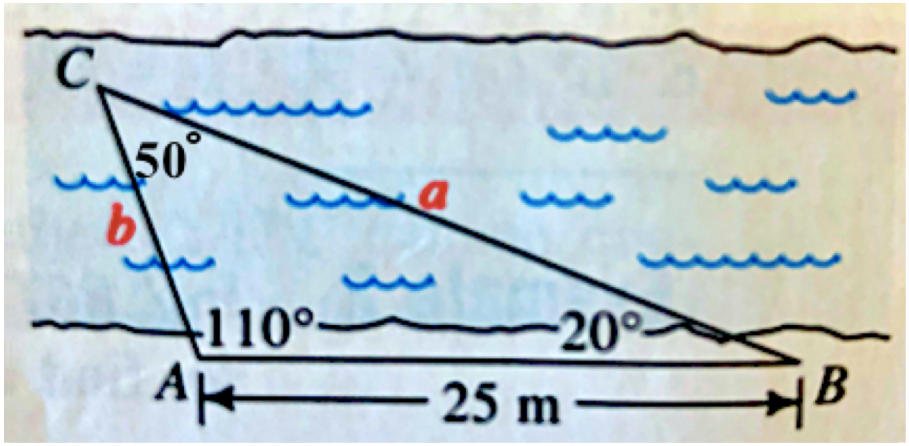
Example 1:

A civil engineer wants to determine the distances from points A and B to an inaccessible point C. From direct measurement the engineer knows that $AB = 25\text{m}$, $\angle A = 110^\circ$, and $\angle B = 20^\circ$. Find AC and BC.

We can first easily find the measure of $\angle C$.

$$\angle C = 180^\circ - (110^\circ + 20^\circ)$$

$$\angle C = 50^\circ$$



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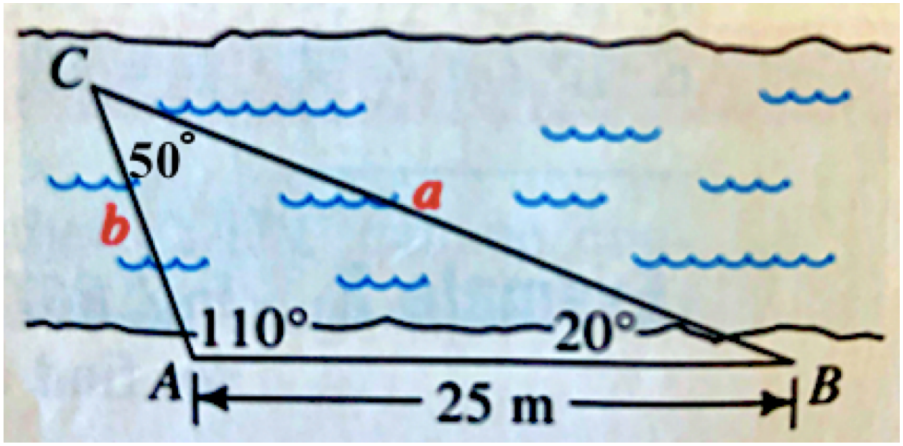

Then, we can use the Law of Sines to find sides b and a.

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

$$\frac{\sin 20^\circ}{b} = \frac{\sin 50^\circ}{25} \qquad \frac{\sin 110^\circ}{a} = \frac{\sin 50^\circ}{25}$$

$b \approx 11.2\text{m}$ $\qquad$ $a \approx 30.7\text{m}$

Practice Problems

Pages 347-348

#3-9 odds, 15, 17