ACC Pre-Calculus
Unit 5 Quiz B Law of Sines and Cosines

Name: _____ B

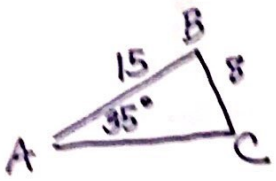
Date: _____ Block: _____

1-4: Solve the following triangles using the Law of Sines or Law of Cosines. If two triangles exist, fill in both sets of data. If only one triangle exists, leave the second set of data blank or put an X through it. If no triangle exists, circle the words "no triangle fits this data". Round all answers to the nearest tenth and include units (degrees!). **You must show sufficient and appropriate work.**

1. $A = 35°$, $a = 8$; $B =$ _____, $b =$ _____; $C =$ _____, $c = 15$

$A = 35°$, $a = 8$; $B' =$ _____, $b =$ _____; $C' =$ _____, $c' = 15$

No Triangle Fits This Data (6)



$$\frac{8}{\sin 35°} = \frac{15}{\sin C}$$

$$\sin C = \frac{15 \sin 35°}{8}$$

$$\sin C \approx 1.0755$$

Since the range of sine is $[-1, 1]$, there is no $\triangle$.

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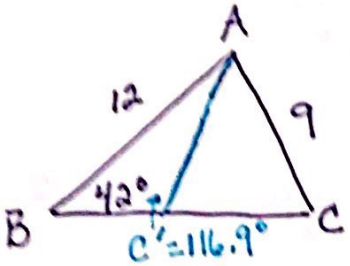
2. $A = 74.9°$, $a = 13.0$; $B = 42°$, $b = 9$; $C = 63.1°$, $c = 12$

$A' = 21.1°$, $a' = 4.8$; $B = 42°$, $b = 9$; $C' = 116.9°$, $c = 12$

No Triangle Fits This Data (6)

SSA - 0, 1, or 2



① $\frac{12}{\sin C} = \frac{9}{\sin 42°}$

$\sin C = \frac{12 \sin 42°}{9}$

$C = 63.1°$

② $\frac{a}{\sin 74.9°} = \frac{12}{\sin 63.1°}$

$a = \frac{12 \sin 74.9°}{\sin 63.1°}$

$a \approx 13.0$

③ $\measuredangle C' = 180° - 63.1°$
$= 116.9°$

$\measuredangle A' = 21.1°$

So 2nd $\triangle$ exists

④ $\frac{a'}{\sin 21.1°} = \frac{9}{\sin 42°}$

$a' = \frac{9 \sin 21.1°}{\sin 42°}$

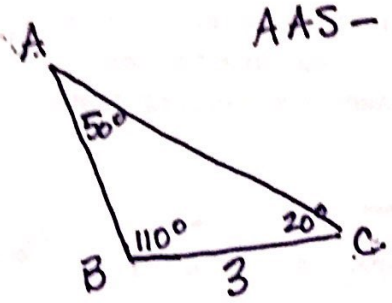
$a' = 4.8$

3. $A = 50°$, $a = 3$
$B = 110°$, $b = 3.7$
$C = 20°$, $c = 1.3$

$A' = 50°$, $a = 3$
$B' =$ ____, $b' =$ ____
$C' = 20°$, $c' =$ ____

No Triangle Fits This Data

AAS – LOS – 1 △



$\frac{b}{\sin 110°} = \frac{3}{\sin 50°}$ $\quad \frac{c}{\sin 20°} = \frac{3}{\sin 50°}$

$b = \frac{3 \sin 110°}{\sin 50°}$ $\quad c = \frac{3 \sin 20°}{\sin 50°}$

$b = 3.7$ $\quad C = 1.3$

4. $A = 128.8°$, $a = 4.2$
$B = 40.5°$, $b = 3.5$
$C = 10.7°$, $c = 1$

$A' =$ ____, $a = 4.2$
$B' =$ ____, $b = 3.5$
$C' =$ ____, $c = 1$

No Triangle Fits This Data

SSS – LOC – 1 Start with longest side!

① $4.2^2 = 3.5^2 + 1^2 - 2(3.5)(1)\cos A$

$17.64 = 12.25 + 1 - 7\cos A$

$-13.25 \quad -13.25$

$\frac{4.39}{-7} = \frac{-7\cos A}{-7}$

$\cos A = \frac{4.39}{-7}$

$\measuredangle A = 128.8°$

② $\frac{3.5}{\sin B} = \frac{4.2}{\sin 128.8°}$

$\sin B = \frac{3.5 \sin 128.8°}{4.2}$

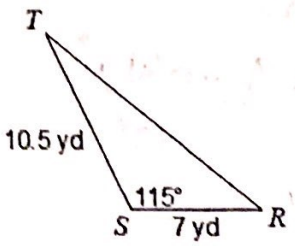
$\measuredangle B = 40.5°$

③ $\measuredangle C = 180 - (128.8 + 40.5)$

$\measuredangle C = 10.7°$

Find the area of each triangle. Choose the *best* formula and include units.

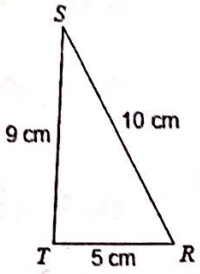
5.



$K = \frac{1}{2}(10.5)(7)\sin 115°$

$K = 33.3 \text{ yds}^2$

6.



$s = \frac{1}{2}(9 + 10 + 5) = 12$

$K = \sqrt{12(3)(2)(7)}$

$K = 22.4 \text{ cm}^2$