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

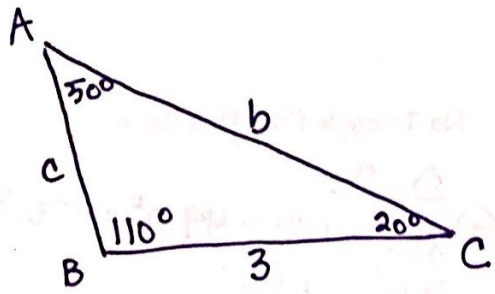
Name: _____

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

AAS - LOS - 1 Δ



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

No Triangle Fits This Data

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

$b = \frac{3 \sin 110°}{\sin 50°}$

$b \approx 3.7$

$\frac{c}{\sin 20°} = \frac{3}{\sin 150°}$

$c = \frac{3 \sin 20°}{\sin 150°}$

$c \approx 1.3$

2. $A = 45.8°$, $a = 2.7$
   $B = 118.8°$, $b = 3.3$
   $C = 15.4°$, $c = 1$

~~$A' =$ _____, $a = 2.7$~~
~~$B' =$ _____, $b = 3.3$~~
~~$C' =$ _____, $c = 1$~~

No Triangle Fits This Data

SSS - LOC - 1 Δ start with largest side!

① $3.3^2 = 2.7^2 + 1^2 - 2(2.7)(1)\cos B$

$10.89 = 7.29 + 1 - 5.4 \cos B$

$-8.29 \quad -8.29$

$\frac{2.6}{-5.4} = \frac{-5.4 \cos B}{-5.4}$

$\cos B = \frac{2.6}{-5.4}$

$\measuredangle B = \cos^{-1}(\text{ANS})$

$\measuredangle B = 118.8°$

② $\frac{2.7}{\sin A} = \frac{3.3}{\sin 118.8°}$

$\sin A = \frac{2.7 \sin 118.8°}{3.3}$

$\measuredangle A = \sin^{-1}(\text{ANS})$

$\measuredangle A = 45.8°$

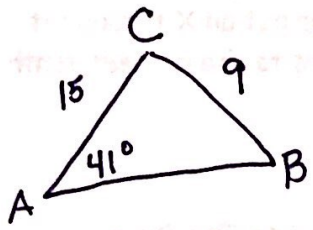
③ $\measuredangle C = 180 - (118.8 + 45.8)$

$\measuredangle C = 15.4°$

3. $A = 41°$, $a = 9$
$B =$ _____, $b = 15$
$C =$ _____, $c =$ _____

$A = 41°$, $a = 9$
$B' =$ _____, $b = 15$
$C' =$ _____, $c' =$ _____

No Triangle Fits This Data



$$\frac{9}{\sin 41°} = \frac{15}{\sin B}$$

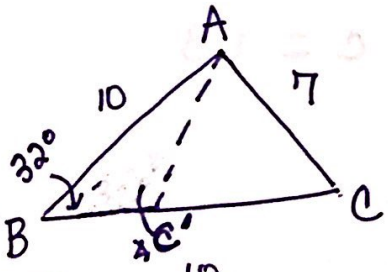
$$\sin B = \frac{15 \sin 41°}{9}$$

$\sin B = 1.0598$ Too big! So no △.

4. $A = 98.8°$, $a = 13.1$
$B = 32°$, $b = 7$
$C = 49.2°$, $c = 10$

$A' = 17.2°$, $a' = 3.9$
$B = 32°$, $b = 7$
$C' = 130.8°$, $c = 10$

No Triangle Fits This Data



① $\frac{7}{\sin 32°} = \frac{10}{\sin C}$

$\sin C = \frac{10 \sin 32°}{7}$ → $\angle C \approx 49.2°$

$\angle A = 98.8°$

② $\frac{a}{\sin 98.8°} = \frac{7}{\sin 32°}$

$a = \frac{7 \sin 98.8°}{\sin 32°}$

$a \approx 13.1$

△ 2

③ $\angle C' = 180 - 49.2° = 130.8°$

$\angle A' = 17.2°$

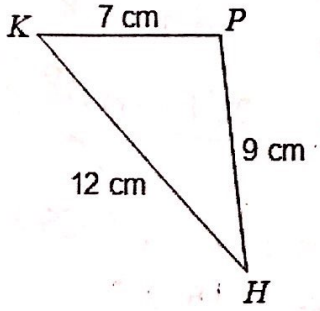
④ $\frac{a}{\sin 17.2°} = \frac{7}{\sin 32°}$

$a = \frac{7 \sin 17.2°}{\sin 32°}$

$a \approx 3.9$

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

5.

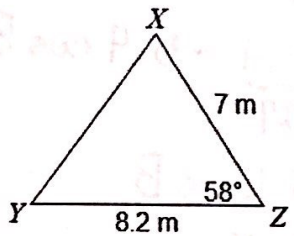


$s = 14$

$K = \sqrt{14(2)(7)(5)}$

$K = 31.3 \text{ cm}^2$

6.



$K = \frac{1}{2}(8.2)(7)\sin 58°$

$K = 24.3 \text{ m}^2$