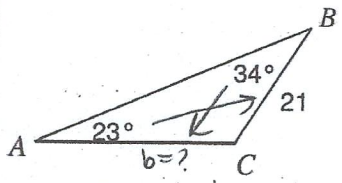
Advanced Functions – 7.1 WS: Law of Sines (LOS) Name: Key

I. Find the indicated side or angle for each given triangle. Round to tenth place. Show work!!!

1.) Find side b.

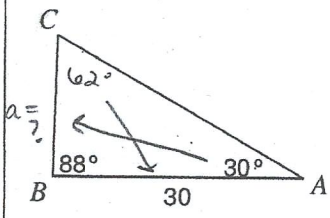


$\frac{21}{\sin 23} \not\equiv \frac{b}{\sin 34}$

$\frac{b\sin 23}{\sin 23} = \frac{21\sin 34}{\sin 23}$

$b = 36.1$

2.) Find side a.

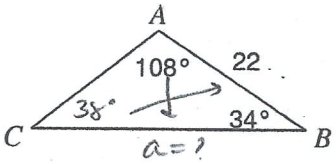


$\frac{30}{\sin 62} \not\equiv \frac{a}{\sin 30}$

$\frac{a\sin 62}{\sin 62} = \frac{30\sin 30}{\sin 62}$

$a = 17$

3.) Find side a.

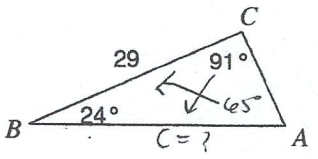


$\frac{22}{\sin 38} \not\equiv \frac{a}{\sin 108}$

$\frac{a\sin 38}{\sin 38} = \frac{22\sin 108}{\sin 38}$

$a = 34$

4.) Find side c.

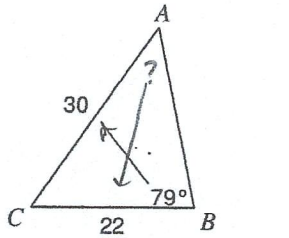


$\frac{29}{\sin 65} \not\equiv \frac{c}{\sin 91}$

$\frac{c\sin 65}{\sin 65} = \frac{29\sin 91}{\sin 65}$

$C = 32$

5.) Find angle A.



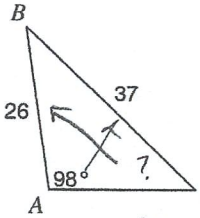
$\frac{30}{\sin 79} = \frac{22}{\sin A}$

$\frac{30\sin A}{30} = \frac{22\sin 79}{30}$

$A = \sin^{-1}\left(\frac{22\sin 79}{30}\right)$

$A = 46°$

6.) Find angle C.



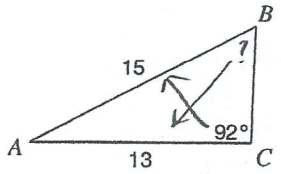
$\frac{37}{\sin 98} = \frac{26}{\sin C}$

$\frac{37\sin C}{37} = \frac{26\sin 98}{37}$

$C = \sin^{-1}\left(\frac{26\sin 98}{37}\right)$

$C = 44.1$

7.) Find angle B.



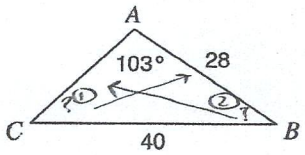
$\frac{15}{\sin 92} = \frac{13}{\sin B}$

$\frac{15\sin B}{15} = \frac{13\sin 92}{15}$

$B = \sin^{-1}\left(\frac{13\sin 92}{15}\right)$

$B = 60°$

8.) Find angle B.



① $\frac{40}{\sin 103} = \frac{28}{\sin C}$

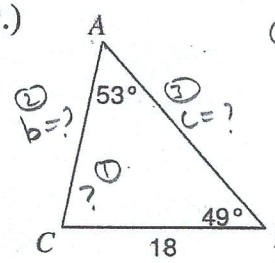
$C = 43°$

② $B = 180 - 103 - 43$

$B = 34°$

II. Solve each triangle. <u>If no drawn triangle is given, draw one</u>. Round to tenth place. Show work!

9.)



① $C = 180 - 53 - 49$

$C = 78°$

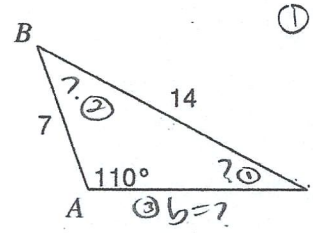
② $\frac{18}{\sin 53} = \frac{b}{\sin 49}$

$b = 17$

③ $\frac{18}{\sin 53} = \frac{c}{\sin 78}$

$c = 22$

10.)



① $\frac{14}{\sin 110} = \frac{7}{\sin C}$

$C = 28°$

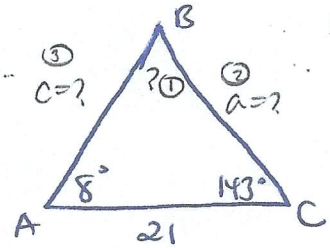
② $B = 180 - 110 - 28$

$B = 42°$

③ $\frac{14}{\sin 110} = \frac{b}{\sin 42}$

$b = 10$

11.) $A = 8°$, $C = 143°$, $b = 21$



① $B = 180 - 8 - 143$

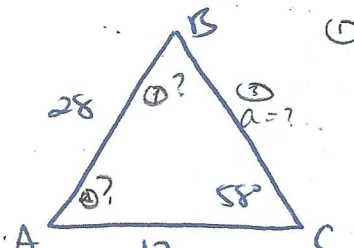
$B = 29°$

② $\frac{21}{\sin 29} = \frac{a}{\sin 8}$

$a = 6$

③ $\frac{21}{\sin 29} = \frac{c}{\sin 143}$ $c = 26$

12.) $C = 58°$, $b = 17$, $c = 28$



① $\frac{28}{\sin 58} = \frac{17}{\sin B}$

$B = 31°$

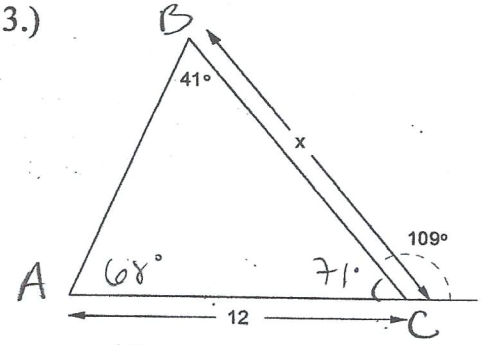
② $A = 180 - 58 - 31$

$A = 91°$

③ $\frac{28}{\sin 58} = \frac{a}{\sin 91}$ $a = 33$

III. Critical Thinking Problems – Find side x, angle θ, what is asked for each given figure. Round to tenth place. Figures NOT DRAWN to SCALE. Must SHOW WORK for credit!

13.)

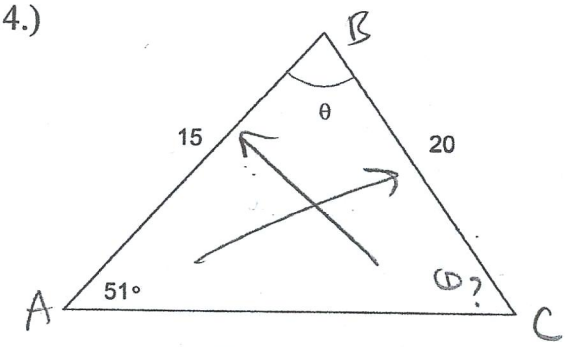


$\frac{12}{\sin 41} = \frac{x}{\sin 68}$

$\frac{x \sin 41}{\sin 41} = \frac{12 \sin 68}{\sin 41}$

$x = 17$

14.)



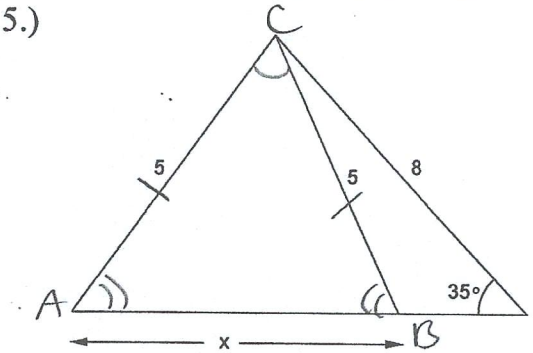
① $\frac{20}{\sin 51} = \frac{15}{\sin C}$

$C = 35.7°$

② $\theta = 180 - 51 - 35.7$

$\theta = 93.3°$

15.)



① $\frac{5}{\sin 35} = \frac{8}{\sin A}$

$A = 66.6°$

$\rightarrow B = 66.6°$ (isosceles Δ)

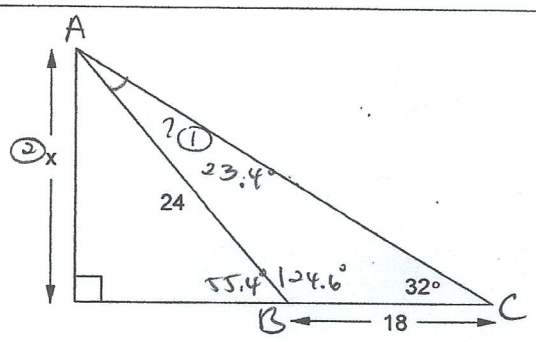
② $C = 180 - 66.6 - 66.6$

$C = 46.8°$

③ $\frac{5}{\sin 35} = \frac{x}{\sin 46.8}$

$x = 6.4$

16.)



① $\frac{24}{\sin 32} = \frac{18}{\sin A}$

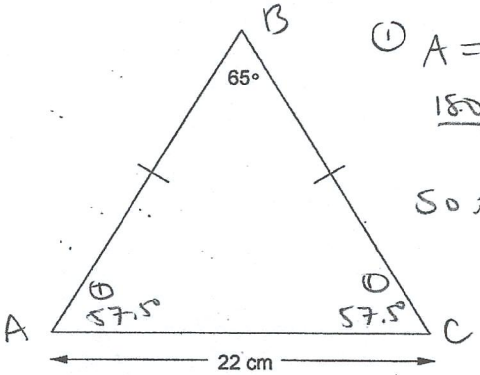
$A = 23.4°$

② $\sin 55.4 = \frac{x}{24}$

$x = 24 \sin 55.4$

$x = 19.8$

17.) Find the perimeter of the triangle.



① $A = C \rightarrow \frac{180 - 65}{2}$

So $A = C = 57.5°$

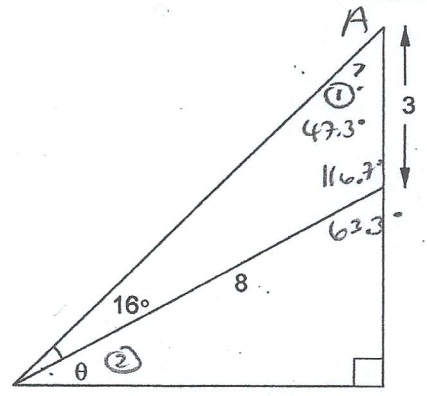
② $\frac{22}{\sin 65} = \frac{a}{\sin 57.5}$

$a = 20.5$

③ $P = 22 + 20.5 + 20.5$

$P = 63 cm$

18:)



① $\frac{3}{\sin 16} = \frac{8}{\sin A}$

$A = 47.3°$

② $\theta = 90 - 63.3$

$\theta = 26.7°$