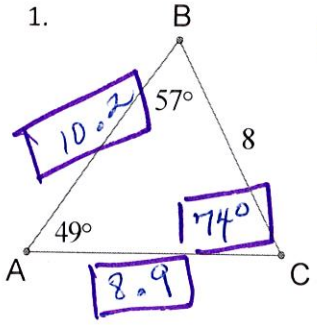
Worksheet: Law of Sines

Solve using the Law of Sines. Round sides and angles to the nearest tenth. (Triangles not drawn to scale.)

1.



$\frac{\sin 49^\circ}{8} = \frac{\sin 57^\circ}{b}$

$b \cdot \sin 49^\circ = 8 \cdot \sin 57^\circ$

$b = \frac{8 \sin 57^\circ}{\sin 49^\circ}$

$b \approx 8.9$

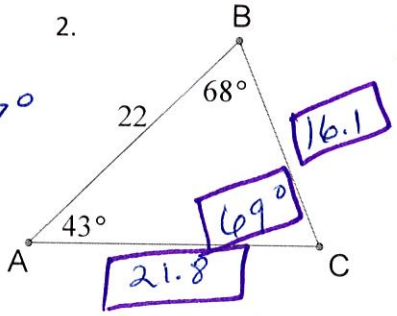
$\frac{\sin 74^\circ}{c} = \frac{\sin 49^\circ}{8}$

$8 \sin 74^\circ = c \sin 49^\circ$

$\frac{8 \sin 74^\circ}{\sin 49^\circ} = c$

$c \approx 10.2$

2.



$\frac{\sin 69^\circ}{22} = \frac{\sin 68^\circ}{b}$

$b \sin 69^\circ = 22 \cdot \sin 68^\circ$

$b = \frac{22 \sin 68^\circ}{\sin 69^\circ}$

$b \approx 21.8$

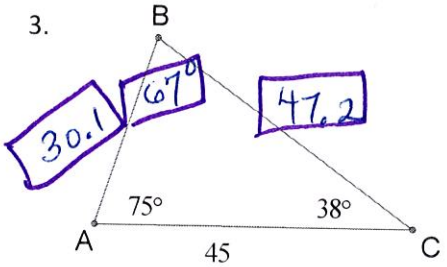
$\frac{\sin 43^\circ}{a} = \frac{\sin 69^\circ}{22}$

$22 \sin 43^\circ = a \sin 69^\circ$

$a = \frac{22 \sin 43^\circ}{\sin 69^\circ}$

$b \approx 16.1$

3.



$\frac{\sin 67^\circ}{45} = \frac{\sin 75^\circ}{a}$

$a \cdot \sin 67^\circ = 45 \sin 75^\circ$

$a = \frac{45 \sin 75^\circ}{\sin 67^\circ} \approx 47.2$

$\frac{\sin 38^\circ}{c} = \frac{\sin 67^\circ}{45}$

$45 \sin 38^\circ = c \cdot \sin 67^\circ$

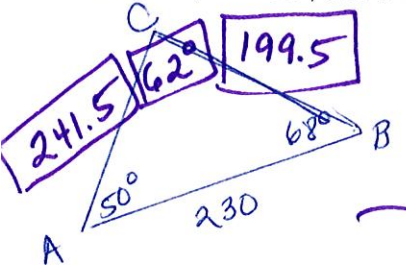
$\frac{45 \sin 38^\circ}{\sin 67^\circ} = c$

$c \approx 30.1$

Sketch each triangle and then solve the triangle using the Law of Sines.

#5-7 worked out on separate paper

4. $A = 50°$, $B = 68°$, and $c = 230$.



$\angle C = 180^\circ - 50^\circ - 68^\circ$

$\angle C = 62^\circ$

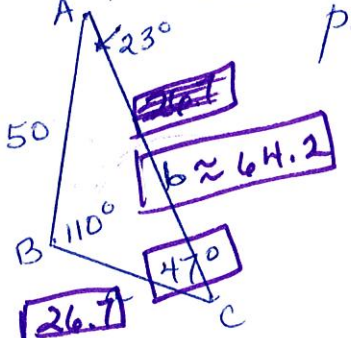
$\frac{\sin 62^\circ}{230} = \frac{\sin 50^\circ}{a}$

$a \cdot \sin 62^\circ = 230 \sin 50^\circ$

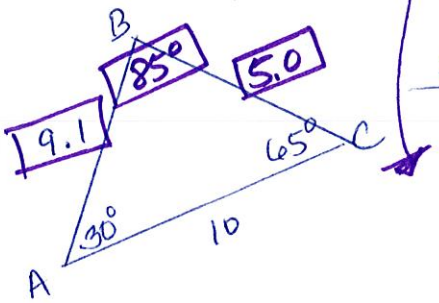
$a = \frac{230 \sin 50^\circ}{\sin 62^\circ}$

$a \approx 199.5$

5. $A = 23°$, $B = 110°$, and $c = 50$.



6. $A = 30°$, $C = 65°$, and $b = 10$.



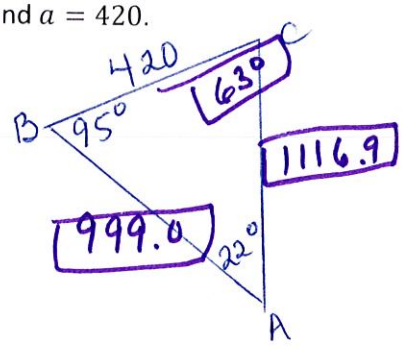
$\frac{\sin 68^\circ}{b} = \frac{\sin 62^\circ}{230}$

$230 \sin 68^\circ = b \sin 62^\circ$

$\frac{230 \sin 68^\circ}{\sin 62^\circ} = b$

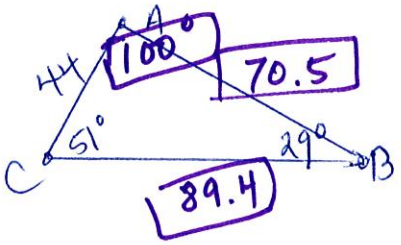
$b \approx 241.5$

7. $A = 22°$, $B = 95°$, and $a = 420$.



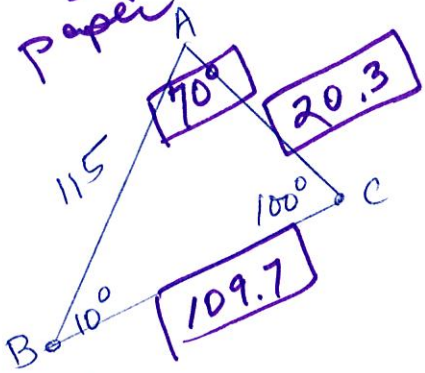
8. $B = 29°$, $C = 51°$, and $b = 44$.

= B, C, a ← ASA
AAS

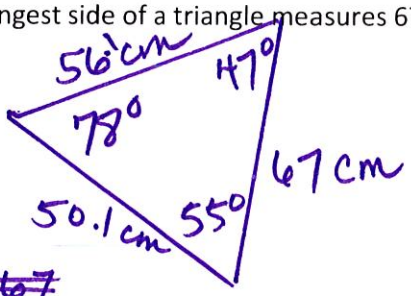


#8 Worked on separate paper

9. $B = 10°$, $C = 100°$, and $c = 115$.



10. The longest side of a triangle measures 67 cm and two of the angles measure 47° and 55°. Solve the triangle.



~~Sin 67~~

Triangle Inequality Thm
3rd angle = 78° (must be opposite longest side)

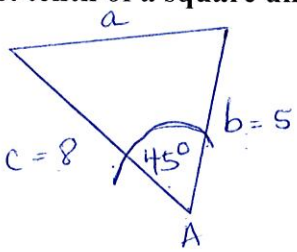
$$\frac{\sin 78°}{67} = \frac{\sin 55°}{x}$$

$$x \cdot \frac{\sin 78°}{\sin 78°} = \frac{67 \sin 55°}{\sin 78°} \approx 56.1 \text{ cm}$$

Find the area of ▲ABC to the nearest tenth of a square unit.

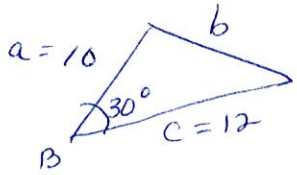
$\frac{1}{2}ab\sin C$

11. $b = 5in., c = 8in., A = 45°$



$\frac{1}{2}(8)(5)\sin 45° \approx$ 14.1 in²

12. $a = 10\,ft., c = 12\,ft., B = 30°$



$\frac{1}{2}(10)(12)\sin 30°$

30 ft²

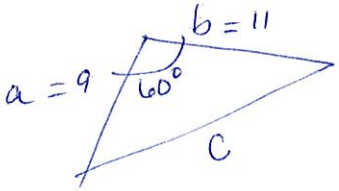
$\frac{\sin 78°}{67} = \frac{\sin 47°}{x}$

$x \sin 78° = 67 \sin 47°$

$x = \frac{67 \sin 47°}{\sin 78°}$

$x \approx 50.1$

13. $a = 9in., b = 11in., C = 60°$

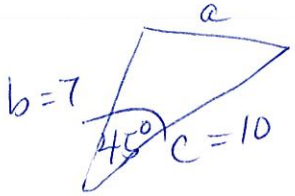


$\frac{1}{2}ab\sin C$

$\frac{1}{2}(9)(11)\sin 60°$

$A \approx$ 42.9 in²

14. $b = 7cm, c = 10cm, A = 45°$



$A = \frac{1}{2}(7)(10)\sin 45°$

$A \approx$ 24.7 cm²