Section 7.4 and 7.5 – Check your Understanding

Solve the triangle (find all sides and angles) from the given information.

1. $\angle A = 10°, \angle B = 60°, a = 4.5$

   Solve for all the missing information

Sin Law to start

$\angle C = 180 - 10 - 60$

$\boxed{\angle C = 110°}$

$\dfrac{4.5}{\text{Sin } 10} = \dfrac{b}{\text{Sin } 60}$
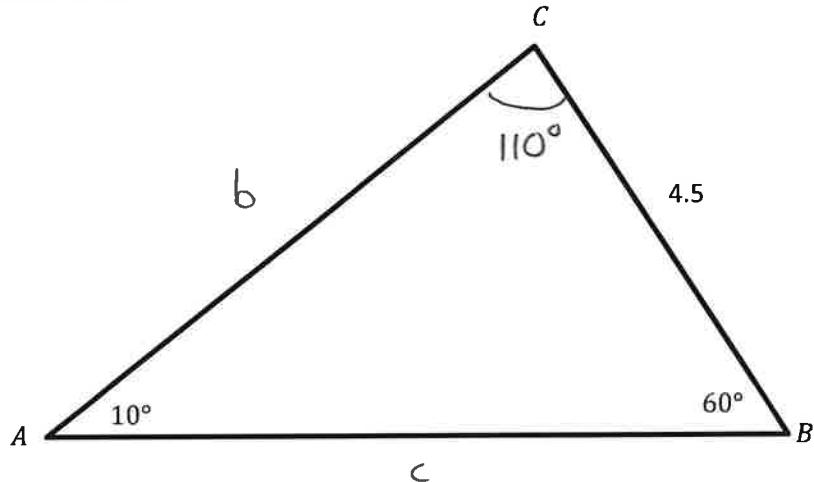
$\dfrac{4.5}{\text{Sin } 10} = \dfrac{c}{\text{Sin } 110}$

Make sure you're in DEGREE MODE

$\dfrac{4.5(\sin 60)}{\text{Sin } 10} = b$

$\dfrac{4.5(\sin 110)}{\text{Sin } 10} = c$

$\boxed{b = 22.4}$

$\boxed{c = 24.4}$

2. Use the Cosine Law to start, then the Sine Law to find the smaller of the remaining angles.
   $\angle C = 47°, a = 8, b = 5$

Solve for all the missing information
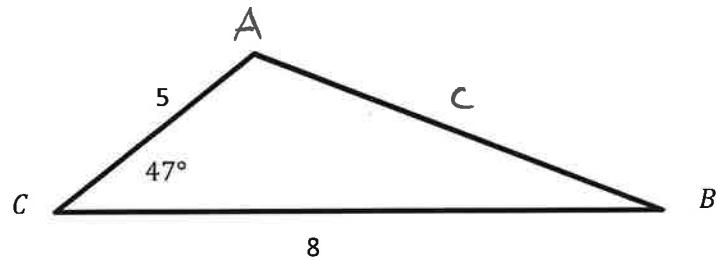
$c^2 = a^2 + b^2 - 2ab\cos C$

$c^2 = 8^2 + 5^2 - 2(5)(8)\cos 47°$

$c^2 = 64 + 25 - 80\cos 47$

$c^2 = 34.4$

$\boxed{c = 5.9}$

Need $\angle B$ 1st

$\dfrac{\sin B}{5} = \dfrac{\sin 47}{5.9}$

$\angle A = 180 - 47 - 38.3$

$\boxed{\angle A = 94.7°}$

$\sin B = \dfrac{\sin 47(5)}{5.9}$

$\sin B = 0.6198$

$B = \sin^{-1}(0.6198)$

$\boxed{B = 38.3°}$

Solve the triangle. Start with the Cosine Law, largest angle first. Draw the triangle

3. $a = 9, b = 14, c = 11$

$$b^2 = a^2 + c^2 - 2ac\cos B$$

$$14^2 = 9^2 + 11^2 - 2(9)(11)\cos B$$

$$196 = 81 + 121 - 198\cos B$$

$$196 = 202 - 198\cos B$$

$$\frac{-6}{-198} = \cos B$$

$$\cos^{-1}\left(\frac{6}{198}\right) = B$$

$$\boxed{\angle B = 88^\circ}$$
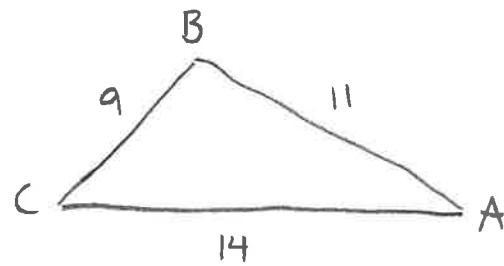
$$\frac{\sin 88.3}{14} = \frac{\sin A}{9}$$

$$\frac{9\sin 88.3}{14} = \sin A$$

$$0.6426 = \sin A$$

$$\sin^{-1}(0.6426) = A$$

$$\boxed{\angle A = 40^\circ}$$

$$\angle C = 180 - 88 - 40$$

$$\boxed{\angle C = 52^\circ}$$