MORE on LOS:

A "Ambiguous Case" "ASS"

\[ c = 12, \quad a = 8, \quad A = 35^\circ \]

\[ \sin 35^\circ = \frac{\text{opp.}}{\text{hyp.}} = \frac{h}{12} \quad \Rightarrow \quad h = 12 \sin (35^\circ) \approx 6.882 \quad 917 \quad 836 \]

\[ \text{Compare } h \text{ w/ "hanging side" } = a \]

II. MORE on LOC:

\[ c^2 = a^2 + b^2 - 2ab \cos C \]

Basically if I know (or can easily find out) two sides and the "included" angle, then I will probably use the LOC to solve the triangle/problem.
Example: [§ 8.3; p. 523; # 17] Solve.

\[ a = 3, \quad b = 4, \quad C = 40^\circ \]

(round to nearest tenth)

\[ \text{Solu. 1} \quad \text{Draw } \triangle ABC. \]

\[ \text{Find "missing" side using LOC.} \]

\[ c^2 = a^2 + b^2 - 2ab \cos C = 9 + 16 - 24 \cos (40^\circ) \]

\[ = 25 - 24 \cos (40^\circ) \approx 6.614 \ 933 \ 365 \approx 6.6 \]

\[ c = \sqrt{25 - 24 \cos (40^\circ)} \approx 2.571 \ 951 \ 276 \approx 2.6 \]

\[ \text{Find } A \quad \frac{a}{\sin A} = \frac{c}{\sin (40^\circ)} \quad \text{Use } \frac{\sin A}{a} = \frac{\sin (40^\circ)}{c} \]

\[ \therefore \sin A = \frac{a \sin (40^\circ)}{c} \approx \frac{3 \sin (40^\circ)}{2.6} \]

\[ \therefore A = \sin^{-1} \left( \frac{3 \sin (40^\circ)}{2.6} \right) \approx 48.570 \ 152.85^\circ \approx 48.6^\circ \]

END of CLASS

cont... after class

4 Find \( B \) : \[ \frac{\sin B}{b} = \frac{\sin C}{c} \]

\[ \therefore \sin B = \frac{b}{c} \sin C \approx \frac{4}{2.6} \sin (40^\circ) \]

So \( B \approx \sin^{-1} \left( \frac{4}{2.6} \sin (40^\circ) \right) \approx 88.570 \ 152.85^\circ \approx 88.6^\circ \)

OR \( B = 180^\circ - A - C = 180^\circ - (A + C) \approx 180^\circ - (48.6^\circ) = 91.4^\circ \)
But wait! I seem to have gotten two different answers for B!

\[ B \approx 88.6^\circ \text{ when I used LOS and } B \approx 91.4^\circ \text{ when I used simple subtraction.} \]

Why? Which answer is "right?" Why?  
[Hint: The "right" answer is 91.4°, but why is 88.6° wrong?]

If you read this and if you email me with the "right" reason before class on Fri and if you are the first person to do so, then I’ll give you a 5pt bonus on your TEST#2 score! (Honor Code – You should figure this out on your own – Don’t get any outside help!)

\[ \text{Final Answer:} \]

\[
\begin{align*}
A &\approx 48.6^\circ & a &= 3 \\
B &\approx 91.4^\circ & b &= 4 \\
C &= 40^\circ & c &\approx 2.6
\end{align*}
\]