**Homework:** FCM 12 p. 31 #3, 5, 6, 10, 12, 15, 17

**Note:** Cosine Law

The cosine law is another law used only for **OBLIQUE** triangles. There are **two versions** of this law, one for finding an unknown side and one for finding an unknown angle.

**Unknown side:** \[ c = \sqrt{a^2 + b^2 - 2ab \cos C} \]

**unknown angle:** \[ C = \cos^{-1} \left( \frac{c^2 - a^2 - b^2}{-2ab} \right) \]

In both cases, it is important to know exactly how your specific calculator works in order for it to give you the correct answer. The unknown angle formula is the most difficult formula to have entered correctly in your calculator. For example, find the unknown in each of the following cases.

(a) \[ x = \sqrt{8^2 + 4^2 - 2(8)(4)\cos 123} \]
\[ x = \sqrt{64 + 16 - 64 \cos 123} \]
\[ x = \sqrt{80 - 64 \cos 123} \]
\[ x = 10.7 mm \]

(b) \[
C = \cos^{-1} \left[ \frac{(8.5^2 - 5.3^2 - 5.2^2)}{-2 \times 5.3 \times 5.2} \right] \\
C = \cos^{-1} \left[ \frac{(72.25 - 30.25 - 27.04)}{-55.12} \right] \\
C = \cos^{-1} \left[ \frac{(17.12)}{-55.12} \right] \\
C = 108.1^\circ
\]

Sometime you will have to draw the triangle given some information. For example, find the unknown side \( b \) given \( \angle B = 58^\circ, a = 4.6 m, c = 6.1 m \)

**Step 1:** Draw the triangle.
Step 2: Identify which law you will use.
Step 3: Solve for the unknown.
\[ b = \sqrt{6.1^2 + 4.6^2 - 2 \times 6.1 \times 4.6 \cos 58} \]
\[ b = \sqrt{58.37 - 56.12 \cos 58} \]
\[ b = 5.4 \text{ cm} \]

*Homework: FCM 12 p. 38 #3, 4, 7, 8, 15, 17, 18*