TODAY'S AGENDA: Week of April 23-27

- Work on Khan Academy Mission:
- Whole Class Lessons

- Today's Objective:

- Law of Sines and Law of Cosines

- Standards:
- G.SRT.C.8:
- Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.

Which Method Do I Use?

SohCahToa:

1. Right Triangle
2. Have either 2 sides and looking for an angle or
3. Have one side and one angle and looking for another side

Law of Sines: (2-sides)

1. Non-Right Triangle
2. Have either 2 angles and looking for one side or
3. Have two sides and looking for an angle

Law of Cosines:(3-sides)

1. Non-Right Triangle
2. Have either 3 sides and looking for one angle or
3. Have two sides and an angle and looking for the 3rd side

Solving Triangles Using the Law of Sines

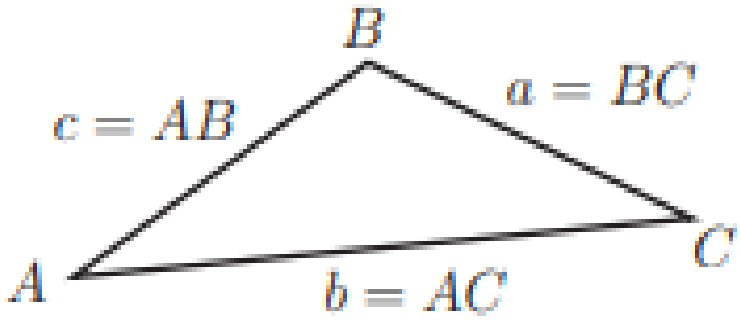
Law of Sines: (2-sides)

1. Non-Right Triangle
2. Have either 2 angles and looking for one side or
3. Have two sides and looking for an angle

Sides

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

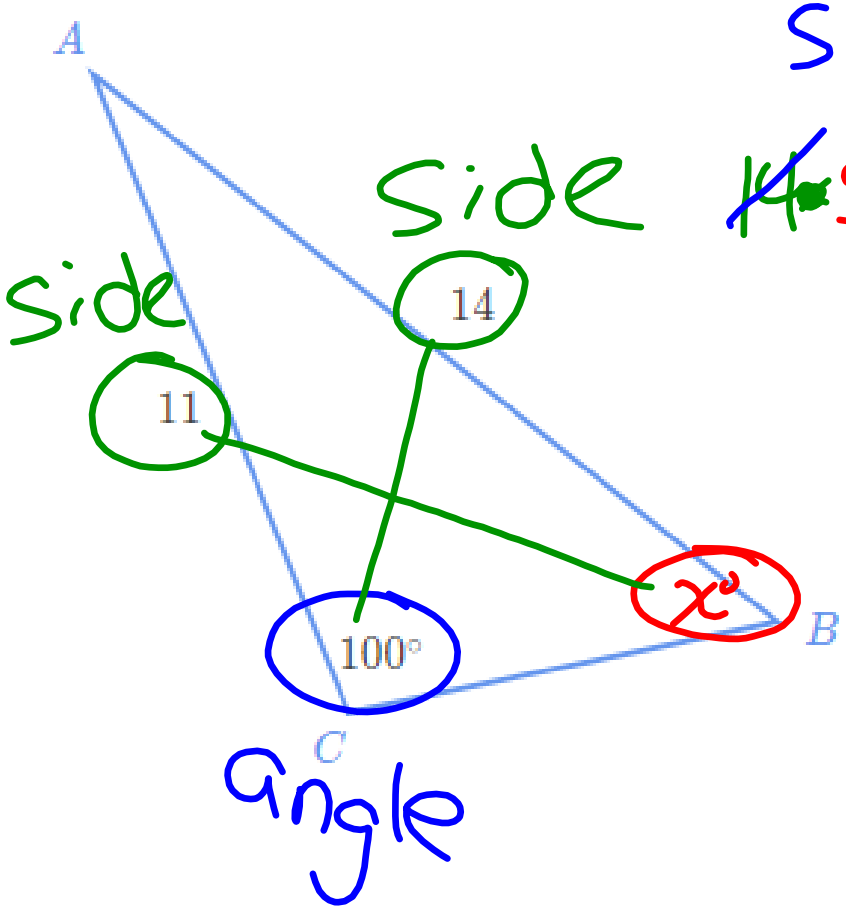
Angles



Find $m\angle B$.

Note that $m\angle B$ is acute. Round to the nearest degree.

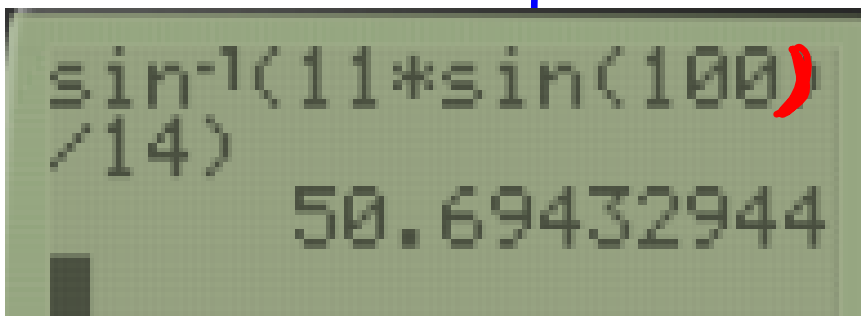
$\square^\circ$



$$\frac{14}{\sin 100} = \frac{11}{\sin x}$$

$$14 \sin x = 11 \sin 100$$

$$\frac{14 \sin x}{14} = \frac{11 \sin 100}{14}$$

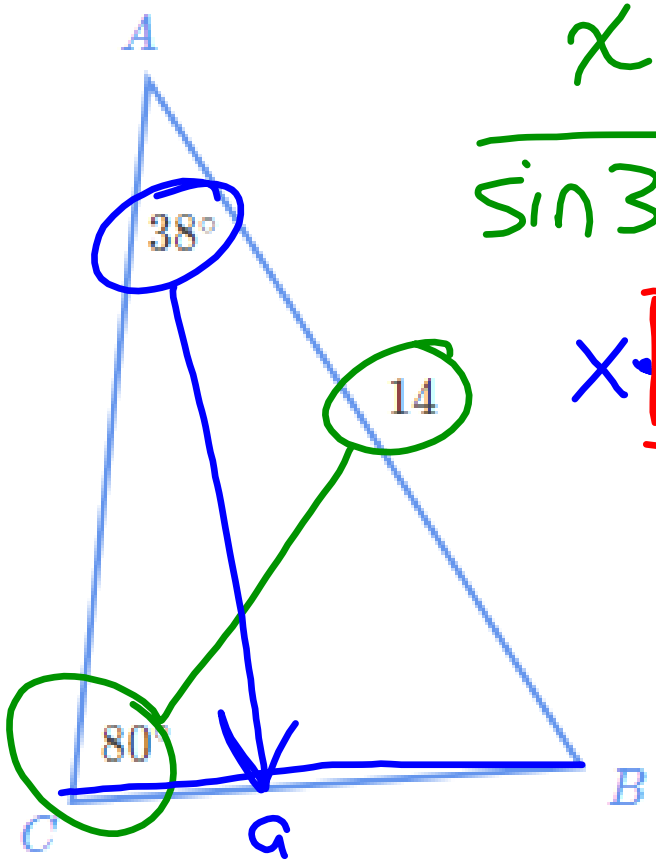


Find $\overline{BC}$. = a

Round to the nearest tenth.

8.8

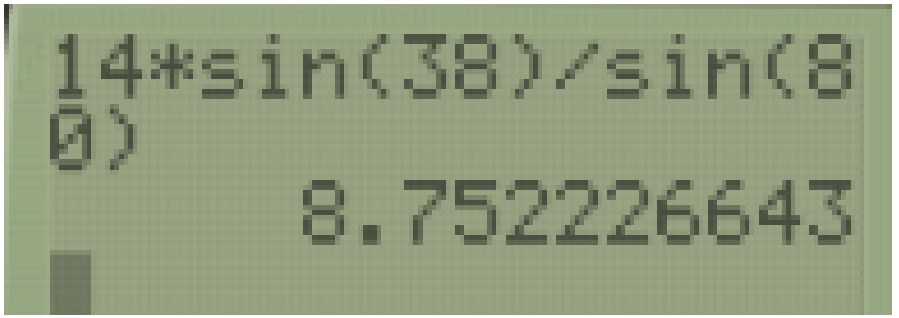
$$\frac{a}{\sin A} = \frac{c}{\sin C}$$



$$\frac{x}{\sin 38} \quad \frac{14}{\sin 80}$$

$$x \cdot \sin 80 = 14 \cdot \sin 38$$

$$\frac{14 \cdot \sin 38}{\sin 80}$$

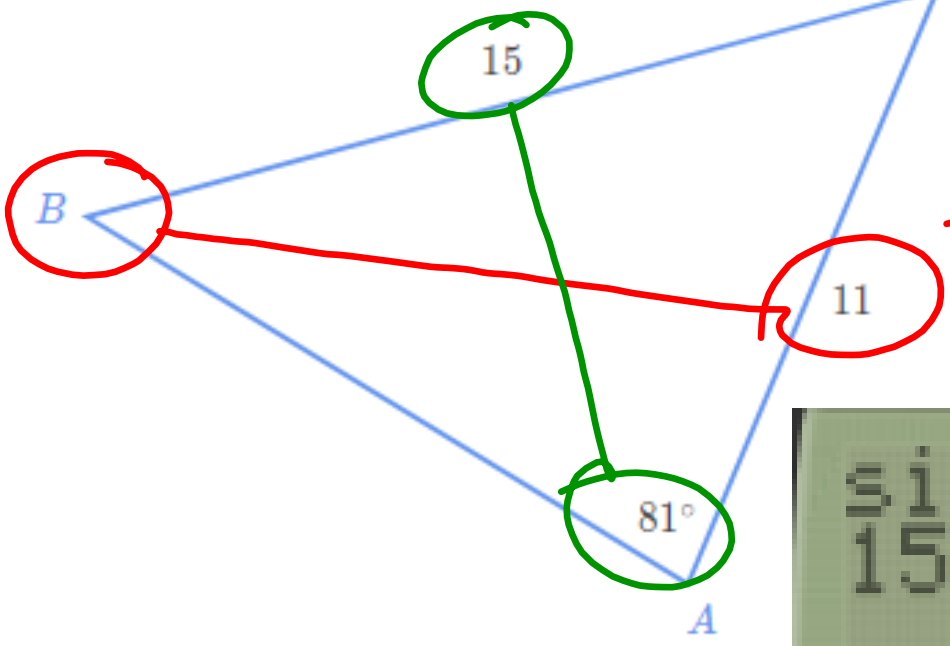


Find $m\angle B$.

Note that $m\angle B$ is acute. Round to the nearest degree.

46.4 °

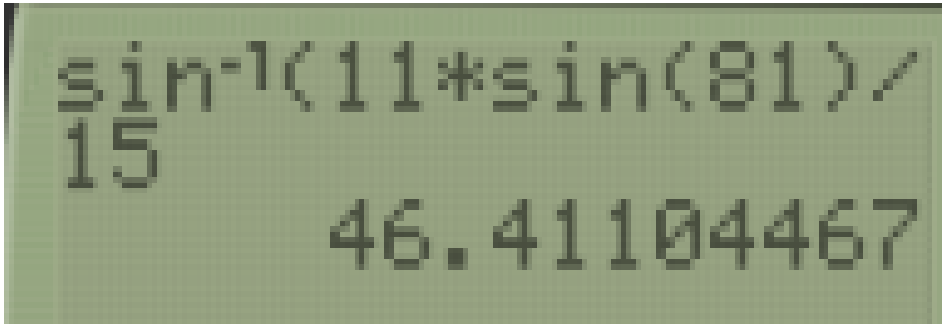
$$\frac{a}{\sin A} = \frac{b}{\sin B}$$



$$\frac{15}{\sin 81} = \frac{11}{\sin x}$$

$$15 \cdot \sin x = 11 \sin 81$$

$$\frac{15 \cdot \sin x}{15} = \frac{11 \sin 81}{15}$$



Solving Triangles Using the Law of Cosines

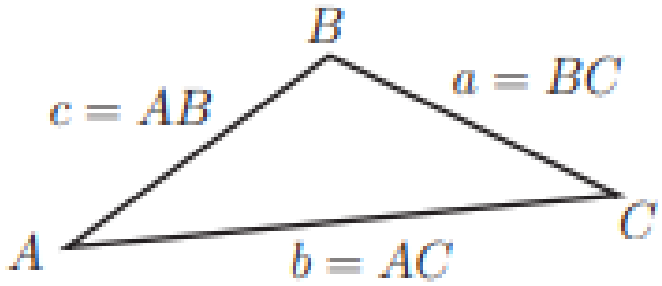
Law of Cosines:(3-sides)

1. Non-Right Triangle
2. Have either 3 sides and looking for one angle or
3. Have two sides and an angle and looking for the 3rd side

$a^2 = b^2 + c^2 - 2bc*\cos A$

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

$c^2 = a^2 + b^2 - 2ab*\cos C$

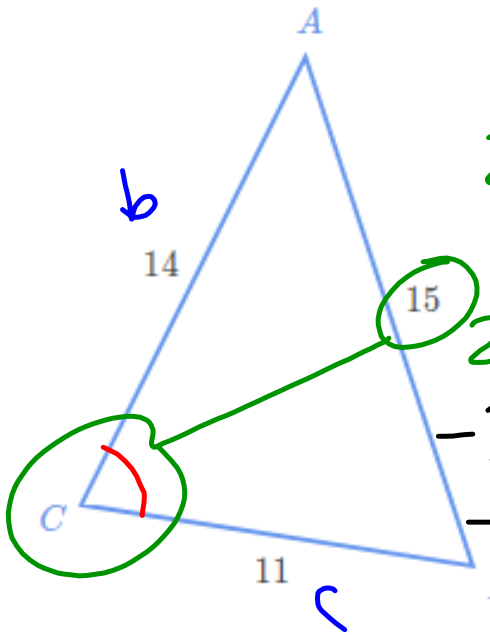


Find $m\angle C$.
Round to the nearest degree.

73°

Looking for an Angle

$a^2 = b^2 + c^2 - 2bc*\cos A$



b

$15^2 = 14^2 + 11^2 - 2 \cdot 14 \cdot 11 \cdot \cos X$

$225 = 196 + 121 - 2 \cdot 154 \cos X$

$225 = 317 - 308 \cos X$

$-317 \quad -317$

$-92 = -308 \cos X$

$\frac{-92}{-308} = \frac{-308 \cos X}{-308}$

c

cos⁻¹(-92/-308)
72.62038319

$$\begin{array}{r} 14 \\ \times\ 11 \\ \hline 154 \end{array}$$

$$\begin{array}{r} 11 \\ 11 \\ \hline 121 \end{array}$$

$$\begin{array}{r} 23 \\ 11 \\ \hline 253 \end{array}$$

Find AB.

Round to the nearest tenth.

Looking for a Side

$a^2 = b^2 + c^2 - 2bc*\cos A$

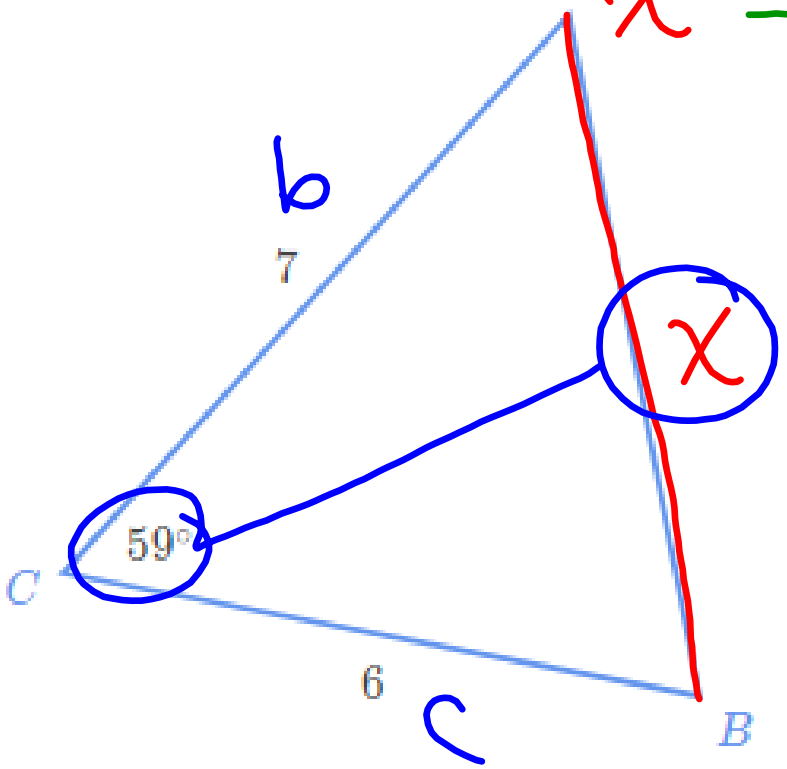
$x^2 = 7^2 + 6^2 - 2 \cdot 7 \cdot 6 \cdot \cos 59$

in Calc

$x^2 = 41.7366$

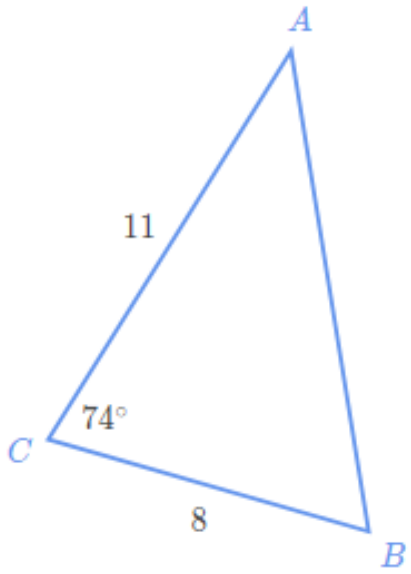
$x = \sqrt{41.7366}$

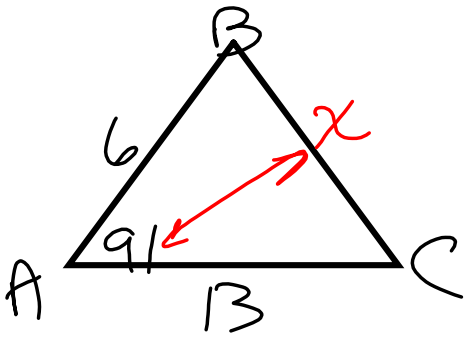
$x = 6.5$



Find AB.

Round to the nearest tenth.



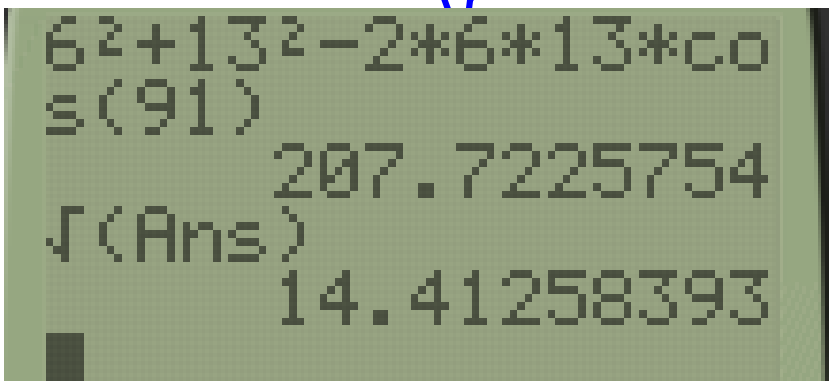


side angle

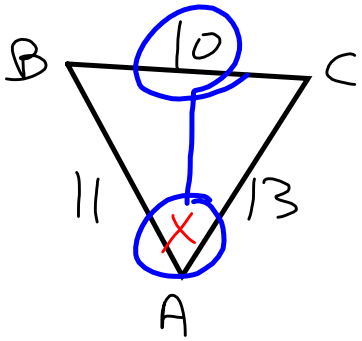
$x^2 = a^2 + b^2 - 2ab\cos X$

$x^2 = 6^2 + 13^2 - 2(6 \cdot 13)\cos 91$

$x^2 = 207.7\ldots$



$x = 14.4$



side $X^2 = a^2 + b^2 - 2ab\cos A$ angle

$10^2 = 11^2 + 13^2 - 2(11 \cdot 13)\cos X$

143

$100 = 121 + 169 - 286\cos X$

$100 = 290 - 286\cos X$

$-290 \quad -290$

$-190 = -286\cos X$

$-286 \quad -286$

$\frac{-190}{-286} = \cos X$

$\cos^{-1}(-190/-286)$

48.36862046

48°

Skills You Should Be Working on:

1. Solve triangles using the Law of Sines
2. Solve triangles using the Law of Cosines
3. General Triangle Word Problems