Bellwork: Solve for x.

$\cancel{\sin^{-1}}$ $\sin^{-1}$

$\cancel{\sin} x = .85$

$x = \sin^{-1}(.85)$

$\boxed{1.02 \text{ rad}}$

$\pi - 1.02 = \boxed{2.12 \text{rad}}$

ACT Prep: schools.shmoop.com math drills!

10) $-27.66 = 3\tan\theta$

$\frac{-27.66}{3} = \frac{3\tan\theta}{3}$

$\tan^{-1}(-9.22) = \cancel{\tan^{-1}}\ \cancel{\tan}\theta$

$\theta = -1.462$

$+2\pi$

$\boxed{\theta = 1.678 \quad \theta = 4.82}$

16) $-0.0006 = .001\sin(1320\pi t)$

$\frac{-0.0006}{.001} = \frac{\cancel{.001}\sin(1320\pi t)}{\cancel{.001}}$

$\sin^{-1} -0.6 = \cancel{\sin^{-1}}\ \cancel{\sin}(1320t\pi)$

$1320\pi t = \sin^{-1}(-.6)$

$\pi + .643$

$\cancel{1320\pi t = -.643}$

$\frac{1320\pi t}{1320\pi} = \frac{5.64}{(1320\pi)}$

$t = .00136$

$\frac{1320\pi t}{(1320\pi)} = \frac{3.78}{(1320\pi)}$

$\boxed{t = 9.11 \times 10^{-4}}$

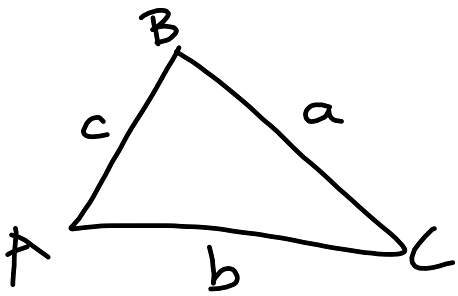
.000911

Homework 6.2 Solutions

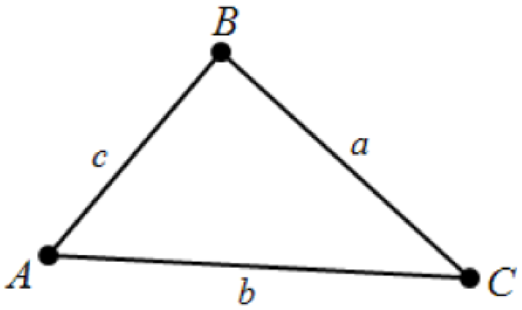
1) $\{1.69, 4.83\}$	2) $\{3.93, 5.5\}$	3) $\{0.79, 3.93\}$	4) $\{1.57, 4.71\}$
5) $\{3.38, 6.04\}$	6) $\{0.47, 5.81\}$	7) No solution.	8) $\{0.71, 2.43\}$
9) $\{2.35, 3.94\}$	10) $\{1.68, 4.82\}$	11) $\{1.49, 4.79\}$	12) $\{1.57\}$
13) $\{2, 4.28\}$	14) $\{4.22, 5.21\}$	15) 4.1 hours	16) 9.127E-4 seconds

Lesson 6.3 Objectives

I can use Law of Sines and Law of Cosines to solve triangles



The Law of Sines relates the sine of each angle to the length of its opposite side



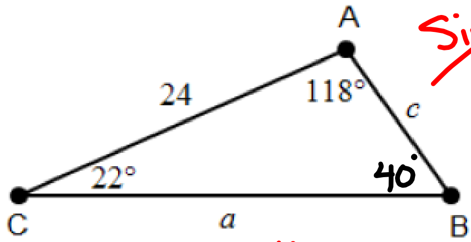
Looking for angle

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

Looking for side

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

Use the Law of Sines to solve the triangle. Round your answers to three decimal places.



$$\frac{\cancel{\sin(22)}\,c}{\cancel{\sin(22)}} = \frac{24\sin(22)}{\sin(40)}$$

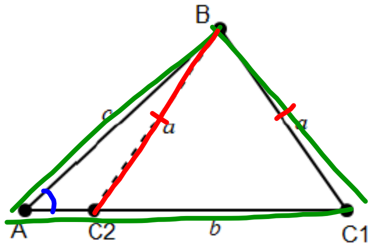
$c = 13.99$

$$\frac{\cancel{\sin 118}\,a}{\cancel{\sin(118)}} = \frac{13.99\sin(118)}{\sin(22)}$$

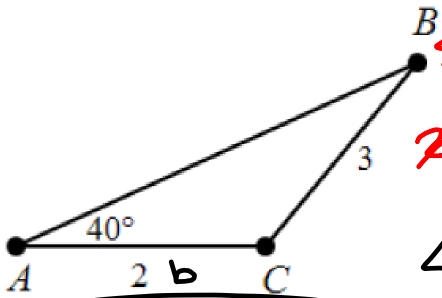
$a = 32.97$

The Ambiguous Case (SSA)

If you are given two angles and one side (ASA or AAS), the Law of Sines will easily provide ONE solution for a missing side. However, the Law of Sines has a problem dealing with SSA. If you are given two sides and one angle, where you must find an angle, the Law of Sines could possibly provide you with one or more solutions or even no solution at all.



Use the Law of Sines to solve the triangle. $\angle A = 40$ $a = 3$ $b = 2$



$$\cancel{2}\cdot\frac{\sin B}{\cancel{2}} = 2\cdot\frac{\sin(40)}{3}$$

$\sin^{-1}$ $\sin^{-1}$

$$\angle B = \sin^{-1}\left(\frac{2\sin(40)}{3}\right)$$

$$\boxed{\begin{gathered}\angle B = 25.37^\circ \\ \angle C = 114.63^\circ\end{gathered}}$$

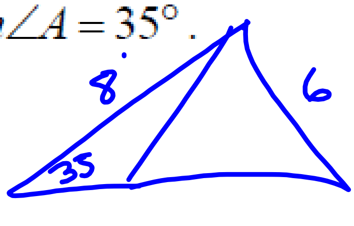
$$\cancel{\angle B_2} = 180 - \text{ans} = 154.65$$

$$\cancel{\angle C_2} = \text{TOO BIG!}$$

$$\cancel{\sin(114.63)}\ \frac{c}{\cancel{\sin(114.63)}} = \frac{3}{\sin(40)}\ \sin(114.63)$$

$$\boxed{c = 4.24}$$

Use the Law of Sines to solve the triangle.
Triangle ABC with sides $a = 6$, $b = 8$, and $m\angle A = 35°$.



$\sin^{-1}$ $8 \cdot \frac{\cancel{\sin}(B)}{\cancel{8}} = \sin^{-1} \frac{8\sin(35)}{6}$

180 − ans

$\angle B = 49.89°$

$\angle B_2 = 130.11°$

$\angle C = 95.11°$

$\angle C_2 = 14.89°$

$\sin 95.11 \cdot \frac{c}{\cancel{\sin(95.11)}} = \frac{6\sin(95.11)}{\sin(35)}$

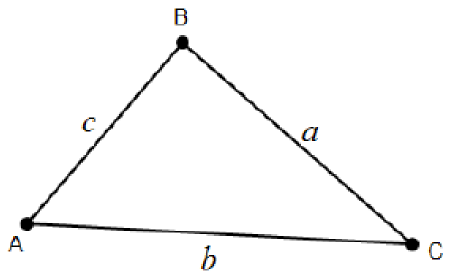
$\sin 14.89 \cdot \frac{c}{\cancel{\sin(14.89)}} = \frac{6\sin(14.89)}{\sin(35)}$

$c = 10.42$

$c = 2.68$

Law of Cosines

For any $\triangle ABC$, the Law of Cosines relates the length of a side to the other two sides of a triangle and the cosine of the included angle.

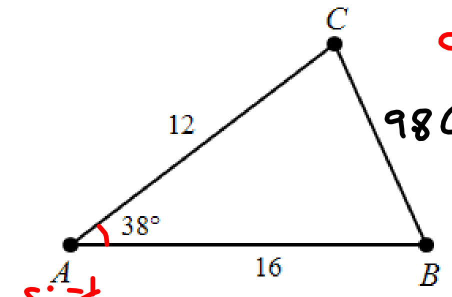


$$a^2 = b^2 + c^2 - 2bc\cos A$$

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

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

Solve the triangle. Round your answers to the nearest thousandth.



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

$98\ a^2 = 12^2 + 16^2 - 2(12)(16)\cos(38)$

$\sqrt{a^2} = \sqrt{97.4}$

$\boxed{a = 9.87}$

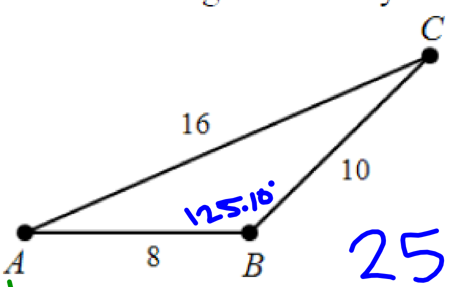
$\boxed{\angle C = 86.5^\circ}$

$\angle B = 55.5^\circ$

$\sin^{-1}\ \cancel{16}\ \frac{\cancel{\sin}\ C}{\cancel{16}} = \sin^{-1}\left(\frac{16\sin(38)}{9.87}\right)$

$\frac{\sin B}{12} = \frac{\sin(38}{9.87}$

Solve the triangle. Round your answers to the nearest thousandth.



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

$(16)^2 = 10^2 + 8^2 - 2(10)(8)\cos B$

$256 = 164 - 160\cos(B)$

$-164 \quad -164$

$\frac{92}{-160} = \frac{-160\cos B}{-160}$

$\cos^{-1}\ -.575 = \cos^{-1}\cos B$

$\boxed{\angle B = 125.100^\circ}$

$\sin^{-1}\ 10\ \frac{\cancel{\sin}\ A}{\cancel{10}} = \sin^{-1}\left(\frac{10\sin(125.1)}{16}\right)$

$\boxed{\angle A = 30.753 \quad \angle C = 24.147}$