

Geometry CC - Unit 8  
Lesson 12: Law of Cosines  
M2 L32

**HW: HW Handout 8.12**

**HW Answers 8.11**

1) $\frac{\sin 29}{10} = \frac{\sin 44}{x}$ $x \sin 29 = 10 \sin 44$ $x = \frac{10 \sin 44}{\sin 29}$ $x \approx 17.4$	2) $\frac{\sin 110}{11} = \frac{\sin 33}{x}$ $x \sin 110 = 11 \sin 33$ $x = \frac{11 \sin 33}{\sin 110}$ $x \approx 6.5$
3) $\frac{\sin 122}{12} = \frac{\sin 15}{x}$ $x \sin 122 = 12 \sin 15$ $x = \frac{12 \sin 15}{\sin 122}$ $x \approx 3.9$	4) $\frac{\sin 73}{17} = \frac{\sin 21}{x}$ $x \sin 73 = 17 \sin 21$ $x = \frac{17 \sin 21}{\sin 73}$ $x \approx 6.1$
5) $\frac{\sin 108}{14} = \frac{\sin 15}{x}$ $x \sin 108 = 14 \sin 15$ $x = \frac{14 \sin 15}{\sin 108}$ $x \approx 3.9$	6) $\frac{\sin 73}{17} = \frac{\sin 21}{x}$ $x \sin 73 = 17 \sin 21$ $x = \frac{17 \sin 21}{\sin 73}$ $x \approx 6.1$
7) $\frac{\sin 108}{18} = \frac{\sin 51}{x}$ $x \sin 108 = 18 \sin 51$ $x = \frac{18 \sin 51}{\sin 108}$ $x \approx 14.7$	8) $\frac{\sin 73}{17} = \frac{\sin 21}{x}$ $x \sin 73 = 17 \sin 21$ $x = \frac{17 \sin 21}{\sin 73}$ $x \approx 6.1$
9) $\frac{\sin 108}{18} = \frac{\sin 51}{x}$ $x \sin 108 = 18 \sin 51$ $x = \frac{18 \sin 51}{\sin 108}$ $x \approx 14.7$	10) $\frac{\sin 73}{17} = \frac{\sin 21}{x}$ $x \sin 73 = 17 \sin 21$ $x = \frac{17 \sin 21}{\sin 73}$ $x \approx 6.1$

Feb 23-2:33 PM

Main Ideas/Questions	Notes
<p><b>Law of Cosines</b></p>	<p>Just like the Law of Sines, the <b>Law of Cosines</b> can be used to find side lengths and angle measurements for <b>any triangle</b>.</p> <p>Given <math>\triangle ABC</math>:</p> $a^2 = b^2 + c^2 - 2bc \cos A$ $b^2 = a^2 + c^2 - 2ac \cos B$ $c^2 = a^2 + b^2 - 2ab \cos C$
<p><b>Finding Missing Sides:</b> Use the Law of Cosines to solve for x. Round to the nearest tenth.</p>	
<p>1)  7      12      x</p>	$\sqrt{x^2} = \sqrt{7^2 + 12^2 - 2(7)(12) \cos 65}$ $x \approx 11.0$

Feb 23-2:34 PM

2)   
25      20      x

$$\sqrt{x^2} = \sqrt{25^2 + 20^2 - 2(25)(20) \cos 108}$$

$$x \approx 36.5$$

Feb 23-2:34 PM

3)   
17      13      x

$$\sqrt{x^2} = \sqrt{17^2 + 13^2 - 2(17)(13) \cos 34}$$

$$x \approx 9.6$$

Feb 23-2:34 PM

**Finding Missing Angles:** Use the Law of Cosines to solve for x. Round to the nearest tenth.

5)   
12      11      7      x

$$7^2 = 12^2 + 11^2 - 2(12)(11) \cos x$$

$$49 = 144 + 121 - 264 \cos x$$

$$49 = 265 - 264 \cos x$$

$$\frac{-216}{-264} = \frac{-264 \cos x}{-264}$$

$$\frac{216}{264} = \cos x$$

$$\cos^{-1} \left( \frac{216}{264} \right) \approx 35.1$$

Feb 23-2:35 PM

6)   
24      16      35      x

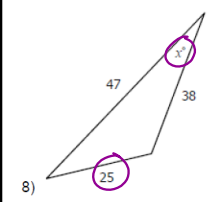
$$35^2 = 24^2 + 16^2 - 2(24)(16) \cos x$$

$$1225 = 832 - 768 \cos x$$

$$\frac{-393}{-768} = \frac{-768 \cos x}{-768}$$

$$\cos^{-1} \left( \frac{393}{768} \right) \approx 120.8$$

Feb 23-2:35 PM



8)

$$25^2 = 47^2 + 38^2 - 2(47)(38)\cos X$$
$$625 = 3,653 - 3,572\cos X$$
$$\frac{-3,028}{-3,572} = \frac{-3,572\cos X}{-3,572}$$
$$\cos^{-1}\left(\frac{3,028}{3,572}\right) \approx 32.0$$

Feb 23-2:35 PM