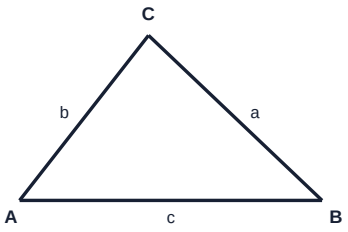
Name _____ Score _____ Teacher _____ Date _____

# Law of Cosines

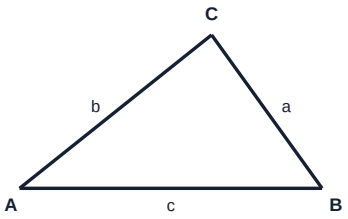
Use the law of cosines to find the requested side or angle. Keep full calculator precision until the final answer, then round as directed.

**1.** **Given b = 9, c = 13, and included angle A = 52°, find side a. Round the final answer to the nearest tenth.**




Reference sketch; calculate using the givens.

**2.** **Given a = 10, b = 13, and c = 16, find angle C. Round the final answer to the nearest tenth.**




Reference sketch; calculate using the givens.

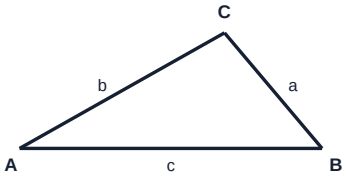
Angles are in degrees. Round only final answers.

Name _____ Score _____ Teacher _____ Date _____

# Law of Cosines

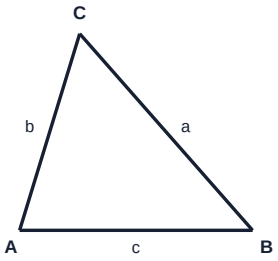
Use the law of cosines to find the requested side or angle. Keep full calculator precision until the final answer, then round as directed.

**3.** **Given a = 9, b = 14, and c = 18, find angle C. Round the final answer to the nearest tenth.**




Reference sketch; calculate using the givens.

**4.** **Given b = 15, c = 17, and included angle A = 73°, find side a. Round the final answer to the nearest tenth.**




Reference sketch; calculate using the givens.

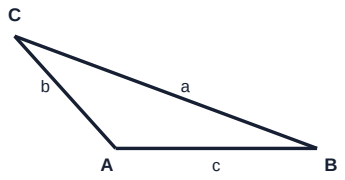
Angles are in degrees. Round only final answers.

Name _____ Score _____ Teacher _____ Date _____

# Law of Cosines

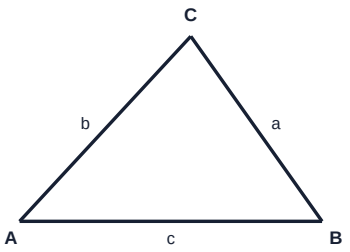
Use the law of cosines to find the requested side or angle. Keep full calculator precision until the final answer, then round as directed.

**5.** **Given b = 9, c = 12, and included angle A = 132°, find side a. Round the final answer to the nearest tenth.**




Reference sketch; calculate using the givens.

**6.** **Given a = 9, b = 10, and c = 12, find angle C. Round the final answer to the nearest tenth.**



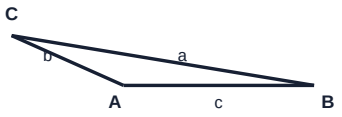

Reference sketch; calculate using the givens.

Name _____ Score _____ Teacher _____ Date _____

# Law of Cosines

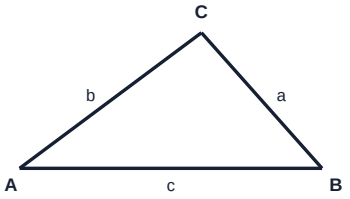
Use the law of cosines to find the requested side or angle. Keep full calculator precision until the final answer, then round as directed.

**7.** **Given b = 9, c = 14, and included angle A = 156°, find side a. Round the final answer to the nearest tenth.**




Reference sketch; calculate using the givens.

**8.** **Given a = 12, b = 15, and c = 20, find angle C. Round the final answer to the nearest tenth.**




Reference sketch; calculate using the givens.

Name _____ Score _____ Teacher _____ Date _____

# Law of Cosines

## Worked Answer Key

Use the law of cosines to find the requested side or angle. Keep full calculator precision until the final answer, then round as directed.

**1. Given b = 9, c = 13, and included angle A = 52°, find side a. Round the final answer to the nearest tenth.**

**Answer: a = 10.3.**

1. $a^2 = b^2 + c^2 - 2bc \cos(A)$
2. $a^2 = 9^2 + 13^2 - 2(9)(13) \cos(52°)$, approximately 105.9352.
3. Using the unrounded radicand, a is approximately 10.3.

**2. Given a = 10, b = 13, and c = 16, find angle C. Round the final answer to the nearest tenth.**

**Answer: C = 87.1°.**

1. $c^2 = a^2 + b^2 - 2ab \cos(C)$
2. $\cos(C) = (a^2 + b^2 - c^2) / (2ab) = (10^2 + 13^2 - 16^2) / (2(10)(13))$, approximately 0.0500.
3. Using the exact side expression, C = cos^-1((10² + 13² - 16²) / (2(10)(13))) is approximately 87.1°.

Name _____ Score _____ Teacher _____ Date _____

# Law of Cosines

## Worked Answer Key

Use the law of cosines to find the requested side or angle. Keep full calculator precision until the final answer, then round as directed.

**3. Given a = 9, b = 14, and c = 18, find angle C. Round the final answer to the nearest tenth.**

**Answer: C = 100.7°.**

1. $c^2 = a^2 + b^2 - 2ab \cos(C)$
2. $\cos(C) = (a^2 + b^2 - c^2) / (2ab) = (9^2 + 14^2 - 18^2) / (2(9)(14))$, approximately -0.1865.
3. Using the exact side expression, C = cos^-1((9² + 14² - 18²) / (2(9)(14))) is approximately 100.7°.

**4. Given b = 15, c = 17, and included angle A = 73°, find side a. Round the final answer to the nearest tenth.**

**Answer: a = 19.1.**

1. $a^2 = b^2 + c^2 - 2bc \cos(A)$
2. $a^2 = 15^2 + 17^2 - 2(15)(17) \cos(73°)$, approximately 364.8904.
3. Using the unrounded radicand, a is approximately 19.1.

Name _____ Score _____ Teacher _____ Date _____

# Law of Cosines

## Worked Answer Key

Use the law of cosines to find the requested side or angle. Keep full calculator precision until the final answer, then round as directed.

**5. Given b = 9, c = 12, and included angle A = 132°, find side a. Round the final answer to the nearest tenth.**

**Answer: a = 19.2.**

1. $a^2 = b^2 + c^2 - 2bc \cos(A)$
2. $a^2 = 9^2 + 12^2 - 2(9)(12) \cos(132°)$, approximately 369.5322.
3. Using the unrounded radicand, a is approximately 19.2.

**6. Given a = 9, b = 10, and c = 12, find angle C. Round the final answer to the nearest tenth.**

**Answer: C = 78.1°.**

1. $c^2 = a^2 + b^2 - 2ab \cos(C)$
2. $\cos(C) = (a^2 + b^2 - c^2) / (2ab) = (9^2 + 10^2 - 12^2) / (2(9)(10))$, approximately 0.2056.
3. Using the exact side expression, C = cos^-1((9² + 10² - 12²) / (2(9)(10))) is approximately 78.1°.

Name _____ Score _____ Teacher _____ Date _____

# Law of Cosines

## Worked Answer Key

Use the law of cosines to find the requested side or angle. Keep full calculator precision until the final answer, then round as directed.

**7. Given b = 9, c = 14, and included angle A = 156°, find side a. Round the final answer to the nearest tenth.**

**Answer: a = 22.5.**

1. $a^2 = b^2 + c^2 - 2bc \cos(A)$
2. $a^2 = 9^2 + 14^2 - 2(9)(14) \cos(156°)$, approximately 507.2135.
3. Using the unrounded radicand, a is approximately 22.5.

**8. Given a = 12, b = 15, and c = 20, find angle C. Round the final answer to the nearest tenth.**

**Answer: C = 94.9°.**

1. $c^2 = a^2 + b^2 - 2ab \cos(C)$
2. $\cos(C) = (a^2 + b^2 - c^2) / (2ab) = (12^2 + 15^2 - 20^2) / (2(12)(15))$, approximately -0.0861.
3. Using the exact side expression, C = cos^-1((12² + 15² - 20²) / (2(12)(15))) is approximately 94.9°.