

Summer Geometry Semester 1 Unit 4 Pretest Analysis SohCahToa, Law of Sines, Cosine...

Lesson 019 | Geometry | Right-triangle trigonometry • Law of sines and ambiguous cases • Law of cosines, area and bearings

<https://www.youtube.com/watch?v=xhaw0YsfCv0>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01

In a right triangle, acute angle θ has opposite leg 50 and adjacent leg 45. Find the hypotenuse, all six trig ratios, and θ to 0.1° .

02

Triangle ABC has $A=40^\circ$, $B=50^\circ$, and $a=117$. Find C and side b to 0.01.

03

A triangle has sides 11 and 3 enclosing 60° . Find the opposite side and area exactly.

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04

In a right triangle, acute angle θ has opposite leg 16 and adjacent leg 20. Find the hypotenuse, all six trig ratios, and θ to 0.1° .

05

Triangle ABC has $A=45^\circ$, $B=65^\circ$, and $a=18$. Find C and side b to 0.01.

06

A triangle has sides 7 and 11 enclosing 60° . Find the opposite side and area exactly.

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01

In a right triangle, acute angle θ has opposite leg 50 and adjacent leg 45. Find the hypotenuse, all six trig ratios, and θ to 0.1° .

Hypotenuse = $5\sqrt{181}$. $\sin \theta = 10/\sqrt{181}$; $\cos \theta = 9/\sqrt{181}$; $\tan \theta = 10/9$; $\csc \theta = \sqrt{181}/10$; $\sec \theta = \sqrt{181}/9$; $\cot \theta = 9/10$. $\theta = \arctan(10/9) \approx 48.0^\circ$.

02

Triangle ABC has $A=40^\circ$, $B=50^\circ$, and $a=117$. Find C and side b to 0.01.

$C=180-40-50=90^\circ$. Law of sines: $b=a \sin B/\sin A=117\sin(50^\circ)/\sin(40^\circ) \approx 139.44$.

03

A triangle has sides 11 and 3 enclosing 60° . Find the opposite side and area exactly.

$c^2=11^2+3^2-2(11)(3)\cos 60^\circ=97$. $c=\sqrt{97}$. Area = $(1/2)(11)(3)\sin 60^\circ=33/4\sqrt{3}$.

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04

In a right triangle, acute angle θ has opposite leg 16 and adjacent leg 20. Find the hypotenuse, all six trig ratios, and θ to 0.1° .

Hypotenuse = $2\sqrt{164}$. $\sin \theta = 8/\sqrt{164}$; $\cos \theta = 10/\sqrt{164}$; $\tan \theta = 8/10$; $\csc \theta = \sqrt{164}/8$; $\sec \theta = \sqrt{164}/10$; $\cot \theta = 10/8$. $\theta = \arctan(8/10) \approx 38.7^\circ$.

05

Triangle ABC has $A=45^\circ$, $B=65^\circ$, and $a=18$. Find C and side b to 0.01.

$C = 180 - 45 - 65 = 70^\circ$. Law of sines: $b = a \sin B / \sin A = 18 \sin(65^\circ) / \sin(45^\circ) \approx 23.07$.

06

A triangle has sides 7 and 11 enclosing 60° . Find the opposite side and area exactly.

$c^2 = 7^2 + 11^2 - 2(7)(11)\cos 60^\circ = 93$. $c = \sqrt{93}$. Area = $(1/2)(7)(11)\sin 60^\circ = 77/4\sqrt{3}$.