

Precalculus - Law of Sines and Law of Cosines - Worksheet

Common Core G-SRT.D.10, G-SRT.D.11, G-SRT.C.8 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice the Law of Sines, the Law of Cosines and triangle area (Common Core G-SRT.D.10, G-SRT.D.11 and G-SRT.C.8). You will solve right and oblique triangles, examine the ambiguous case and use surveying and navigation settings.

Precalculus · Common Core State Standards: **G-SRT.D.10, G-SRT.D.11, G-SRT.C.8**

Exercise 1 - Right triangle: find a leg

In a right triangle, the hypotenuse is 20 and one acute angle is 35° . Find the side opposite that angle.

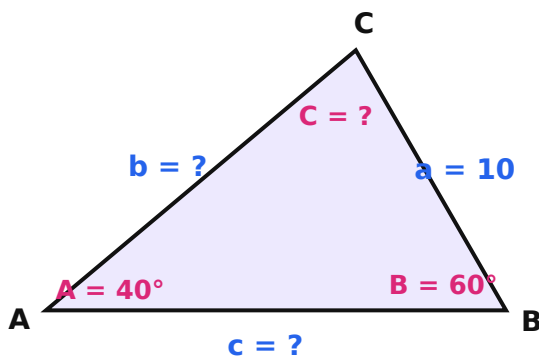
Exercise 2 - Right triangle: tangent

A 62° angle in a right triangle has an adjacent side of 8 ft. Find the opposite side.

Exercise 3 - Solve a right triangle

A right triangle has legs 7 and 24. Find the hypotenuse and both acute angles to the nearest hundredth.

Exercise 4 - Law of Sines (AAS)



Triangle with two angles and a side.

Solve the triangle with $A = 40^\circ$, $B = 60^\circ$, $a = 10$. Round sides to the nearest hundredth.

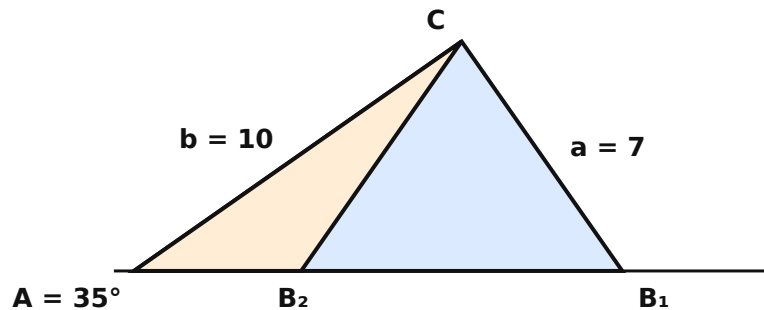
Exercise 5 - Law of Sines (ASA-like)

Solve the triangle with $A = 50^\circ$, $C = 70^\circ$, $c = 12$.

Exercise 6 - SSA with one triangle

Solve the triangle with $a = 15$, $b = 10$, $A = 40^\circ$.

Exercise 7 - Ambiguous case: two triangles



Two triangles fit the data.

Triangle ABC has $A = 35^\circ$, $a = 7$ and $b = 10$. Find both possible values of B and the number of triangles.

Exercise 8 - No triangle

Does a triangle exist with $A = 50^\circ$, $a = 5$ and $b = 10$?

Exercise 9 - Law of Cosines (SAS)

Find c if $a = 8$, $b = 11$ and $C = 48^\circ$.

Exercise 10 - Law of Cosines (SSS)

Find the largest angle of a triangle with sides 7, 9 and 12.

Exercise 11 - All three angles

Find all three angles of the triangle with sides 5, 6 and 7.

Exercise 12 - Area from two sides

Find the area of a triangle with sides 9 and 14 and included angle 35° .

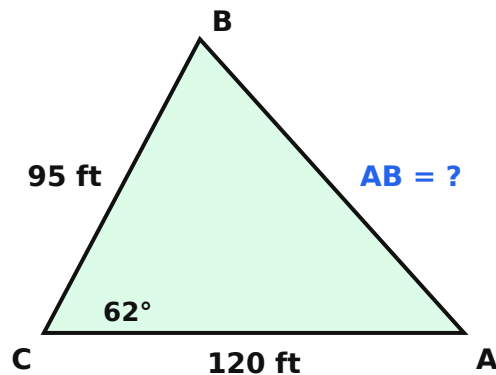
Exercise 13 - Heron's formula

Find the area of a triangle with sides 13, 14 and 15.

Exercise 14 - Choose the law

Tell which law to use first: (a) $a=5$, $b=8$, $C=70^\circ$; (b) $A=30^\circ$, $B=80^\circ$, $c=9$; (c) $a=4$, $b=6$, $c=9$; (d) $a=7$, $b=5$, $A=50^\circ$.

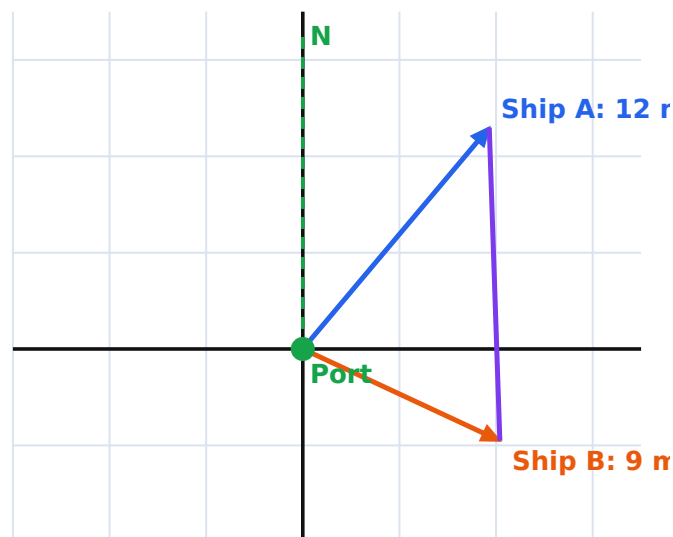
Exercise 15 - Width of a pond



Maya's survey of a pond.

Maya stands at point C , 120 ft from point A and 95 ft from point B on opposite sides of a pond. The angle ACB is 62° . Find the distance AB to the nearest tenth.

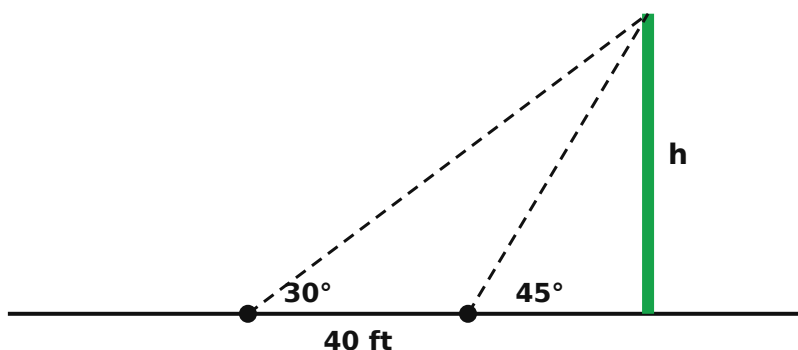
Exercise 16 - Two ships



Positions of two ships.

Ship A is 12 mi from port on bearing 040° . Ship B is 9 mi from port on bearing 115° . How far apart are the ships to the nearest tenth of a mile?

Exercise 17 - Height of a tree



Angles of elevation to the top of a tree.

From a point on level ground the angle of elevation to the top of a tree is 30° . After walking 40 ft toward the tree, the angle is 45° . Find the height h of the tree to the nearest tenth of a foot.

Exercise 18 - Triangular garden

A triangular garden has sides 18 ft, 24 ft and 30 ft. Find its area with Heron's formula and find its largest angle.

Exercise 19 - Roof truss

A roof truss is an isosceles triangle with two sides of 10 ft and a base of 12 ft. Find the apex angle and the base angles to the nearest hundredth.

Exercise 20 - Area from angles and a side

A triangle has $a=10$, $A=40^\circ$ and $B=70^\circ$. Find its area to the nearest tenth.