

Solving Right Triangles with Sine, Cosine and Tangent

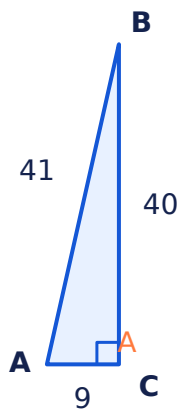
Grade 10 – Geometry math · Worksheet · Standards: G-SRT.C.6, G-SRT.C.7, G-SRT.C.8

Name: _____ Date: _____ Class: _____

This worksheet trains the three trigonometric ratios from similarity, the special 45-45-90 and 30-60-90 triangles, and complete right-triangle solutions (G-SRT.C.6, C.7 and C.8). The problems climb from naming ratios to angles of elevation and depression, ladders, ramps and double sightings.

Standards: G-SRT.C.6, G-SRT.C.7, G-SRT.C.8 · **Level:** Grade 10 Geometry

Problem 1 Naming the Ratios (easy)



Triangle ABC.

Express $\sin A$, $\cos A$ and $\tan A$ as fractions for the triangle in the figure.

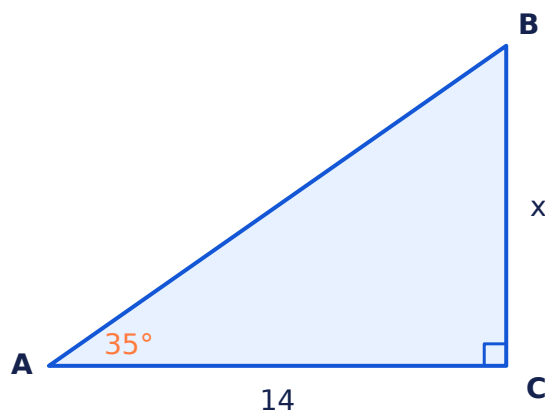
Problem 2 Ratios for the Other Angle (easy)

In right triangle ABC with the right angle at C, $AC = 8$, $BC = 15$ and $AB = 17$. Find $\sin B$, $\cos B$ and $\tan B$.

Problem 3 Complementary Angles (easy)

(a) Write $\cos 67^\circ$ as the sine of an angle. (b) Find x if $\sin 28^\circ = \cos x^\circ$. (c) If $\sin 24^\circ \approx 0.4067$, give $\cos 66^\circ$.

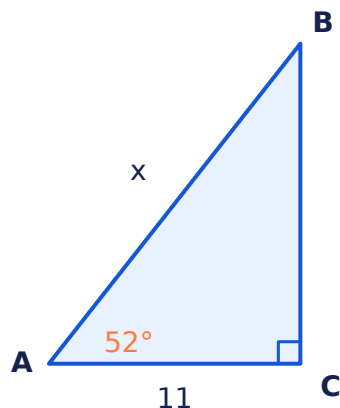
Problem 4 Missing Leg with Tangent (easy)



Find x .

Find x . Round to the nearest tenth.

Problem 5 Hypotenuse with Cosine (easy)



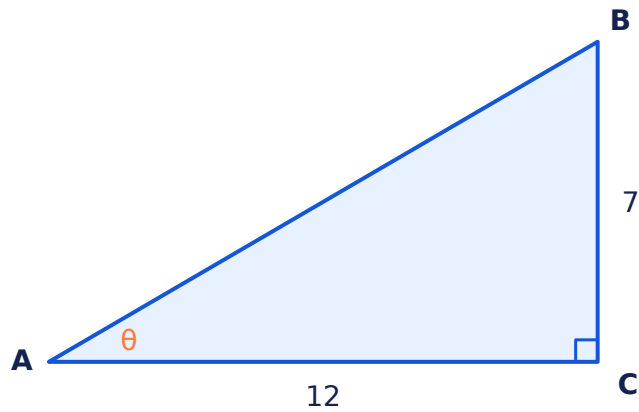
Find x .

Find the hypotenuse x to the nearest tenth.

Problem 6 Leg with Sine (medium)

In right triangle ABC the right angle is at C, the hypotenuse $AB = 23$ and angle $A = 41^\circ$. Find BC to the nearest tenth.

Problem 7 Angle from Two Legs (medium)



Find the angle at A.

Find the measure of angle θ to the nearest tenth of a degree.

Problem 8 Angle from a Sine Ratio (medium)

In a right triangle, the side opposite angle θ is 13 inches and the hypotenuse is 19 inches. Find θ to the nearest tenth of a degree.

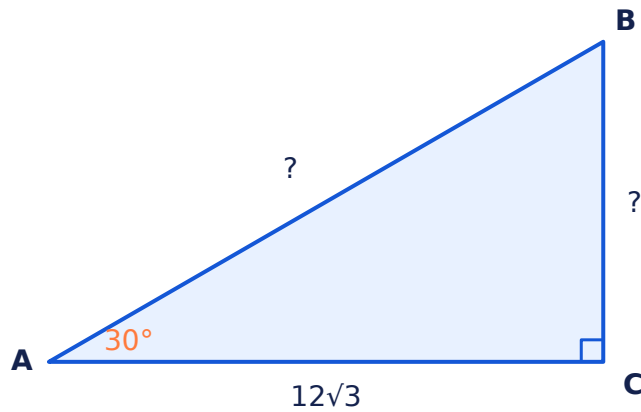
Problem 9 Isosceles Right Triangle (medium)

A square tile 14 centimeters on a side is cut along a diagonal. Give the diagonal exactly, then as a decimal rounded to tenths.

Problem 10 Hypotenuse and Short Leg (medium)

The hypotenuse of a 30-60-90 triangle is 22 feet. Find the short leg and the long leg. Give the long leg in radical form and as a decimal to the nearest tenth.

Problem 11 Starting from the Long Leg (medium)



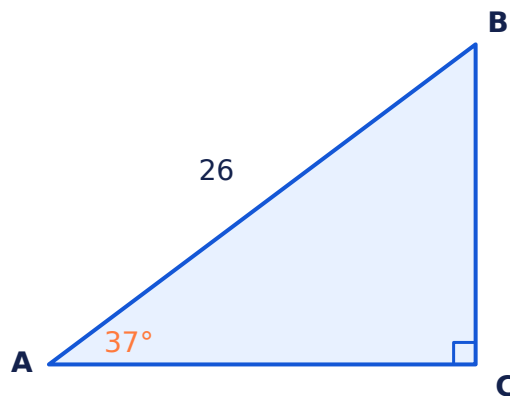
Find BC and AB.

The long leg of this 30-60-90 triangle is $12\sqrt{3}$ inches. Find the other two sides.

Problem 12 Solving from Two Legs (hard)

Solve right triangle ABC (right angle at C) with $AC = 20$ and $BC = 21$. Find AB and both acute angles, rounding angles to the nearest tenth of a degree.

Problem 13 Angle and Hypotenuse (hard)

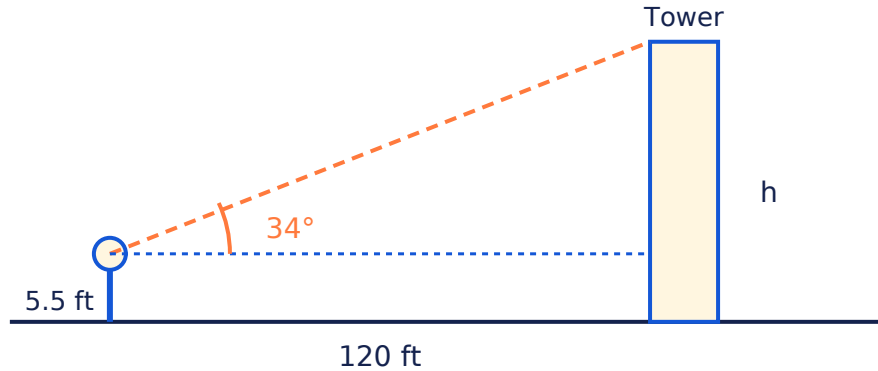


Solve the triangle.

Solve triangle ABC: find BC, AC and angle B. Round sides to the nearest tenth.

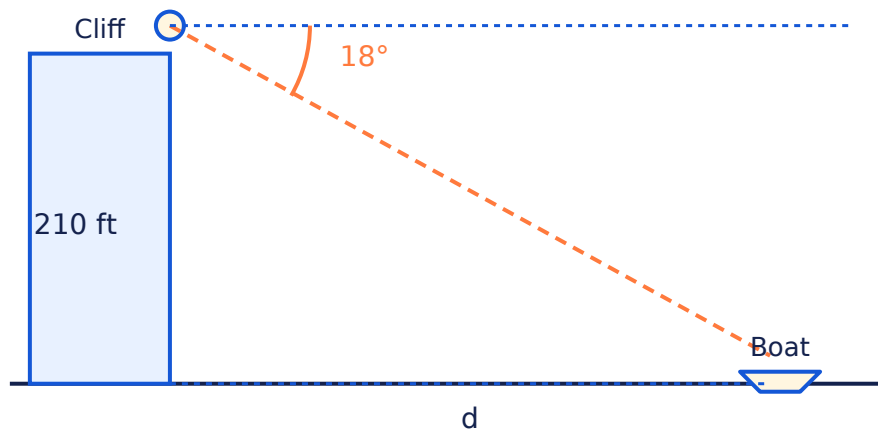
Problem 14 Angle and One Leg (hard)

In right triangle ABC (right angle at C), angle $B = 62^\circ$ and $BC = 9.5$ meters. Find AC, AB and angle A to the nearest tenth.

Problem 15 Surveying a Water Tower (medium)

Surveyor and water tower.

Dani, whose eye level is 5.5 feet, stands 120 feet away from a water tower and sights its top at 34° above level. Calculate the full height of the tower, rounded to tenths.

Problem 16 Boat Below the Cliff (medium)

Angle of depression to a boat.

A hiker on a 210-foot sea cliff sights a sailboat 18° below the horizontal. Determine how far the sailboat sits horizontally from the foot of the cliff, rounded to whole feet.

Problem 17 Wheelchair Ramp (medium)

A food-truck loading ramp climbs 2.5 feet and meets the pavement at 4.8° . Compute the sloped length of the ramp and how far it stretches along the pavement. Round both to tenths.

Problem 18 Ladder and Window (hard)

A 16-foot ladder leans against a wall and makes a 74° angle with the ground. (a) How high does it reach? (b) How far is its base from the wall? (c) Does it reach a window sill 15.5 feet above the ground?

Problem 19 Two Sightings of a Tower (hard)

From one spot on level ground, the angle of elevation to the top of a radio tower is 25° . After walking 90 feet straight toward the tower, the angle of elevation is 40° . Ignore eye height. How tall is the tower to the nearest foot?

Problem 20 Roof Rafters (hard)

A symmetrical gable roof spans 30 feet. Each side rises at a 33° angle. (a) Find the height of the peak above the span. (b) Find the length of one rafter, if rafters overhang the wall by 1.5 feet beyond the span measured along the roof. Give answers to the nearest tenth of a foot.