# Right Triangle Trigonometry

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**9th Grade**

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# *Trigonometric Functions*

## Lesson Objectives:

This lesson will introduce students to the trigonometric ratios in right triangles.
At the end of this lesson, students will be able to set up the three different trig ratios as well as find the length of a missing side given an angle and another side.

## Lesson Outline:

1) Introduction & Vocabulary
2) Practice labeling triangles & setting up ratios
3) Solving for a missing side
4) Word Problems
5) Links to Online Practice Pages

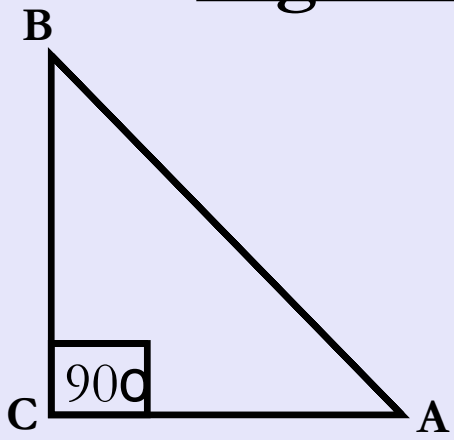

## NYS Math Standards

A.A.42 - Find the sine, cosine, and tangent ratios of an angle of a right triangle, given the lengths of the sides

A.A.43 - Determine the measure of an angle of a right triangle, given the length of any two sides of the triangle

A.A.44 - Find the measure of a side of a right triangle, given an acute angle and the length of another side

# Right Triangle Trigonometry




hypotenuse - side opposite the 90o angle

adjacent - side next to the given angle

opposite - side across from given angle

sine = ———

cosine = ———

tangent = ———

The **opposite** and **adjacent** side will change depending on which angle you are at!

**Erase below to find a helpful hint!!!**

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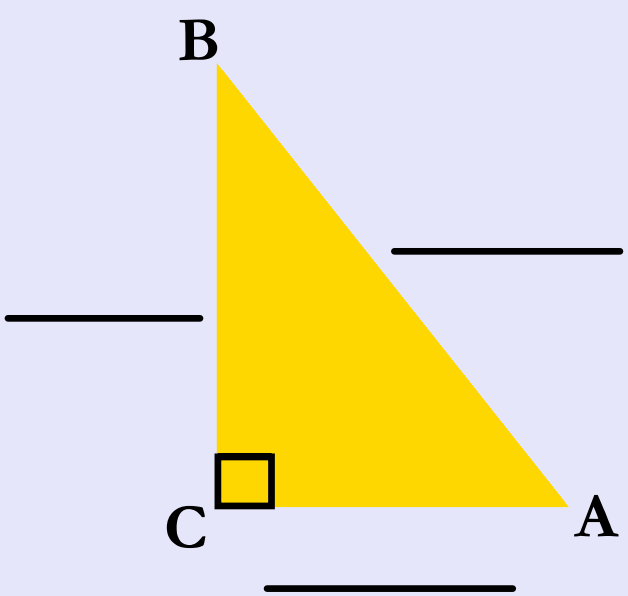
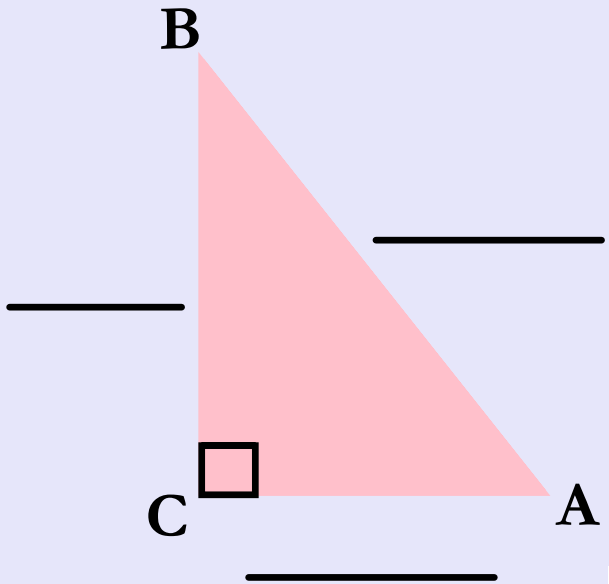
Given the following triangles, label the sides with

adjacent , opposite and hypotenuse.

For angle A




For angle B

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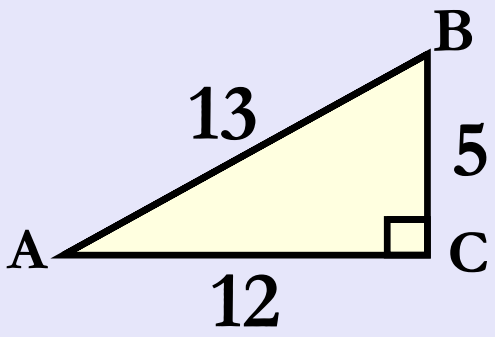
**Given the following triangle, set up the correct trigonometry ratios.**




The numbers are infinitly cloned!!

$\sin A = \frac{\quad}{\quad}$ $\sin B = \frac{\quad}{\quad}$

$\cos A = \frac{\quad}{\quad}$ $\cos B = \frac{\quad}{\quad}$

$\tan A = \frac{\quad}{\quad}$ $\tan B = \frac{\quad}{\quad}$

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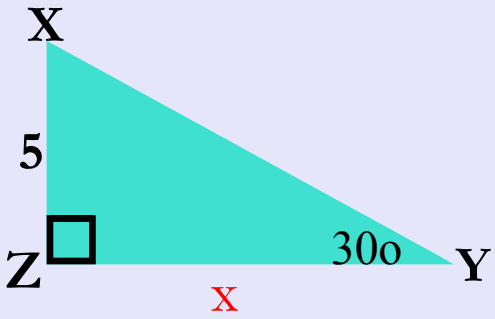
Which of the following is a correct set-up to find the length of side 'x'?




A $\sin 30^o = \frac{5}{x}$

B $\cos 30^o = \frac{x}{5}$

C $\tan 30^o = \frac{5}{x}$

Now find the value of x. (Round to the nearest hundreth)

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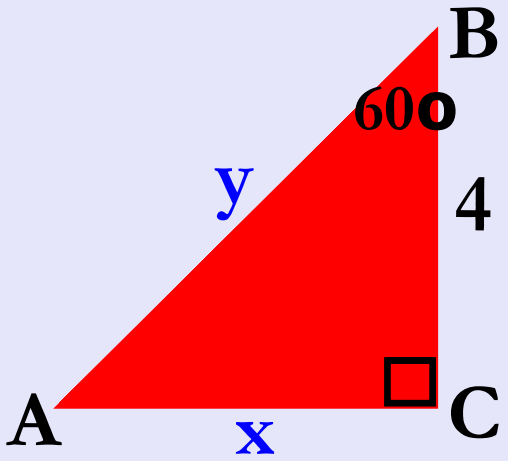
Erase for answer!

Find the length of side x & y on the following triangle.




**Side x**

**Side y**

| sin | cos |
|---|---|
| tan | = |

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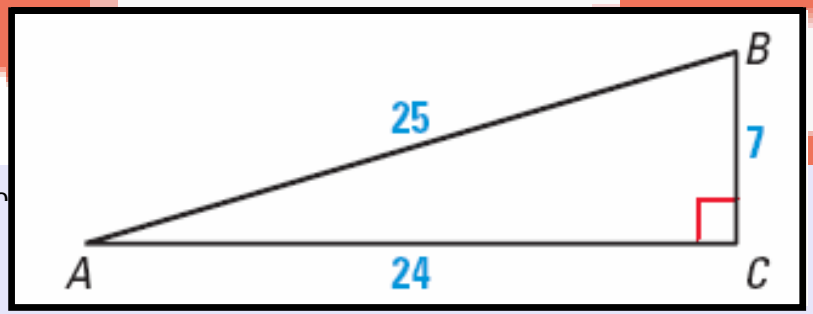


Find the sine of $\angle A$.

sin A =

$\frac{7}{24}$ $\frac{24}{25}$ $\frac{7}{25}$

Find the cosine of $\angle A$.

cos A =

Find the tangent of $\angle A$.

tan A =

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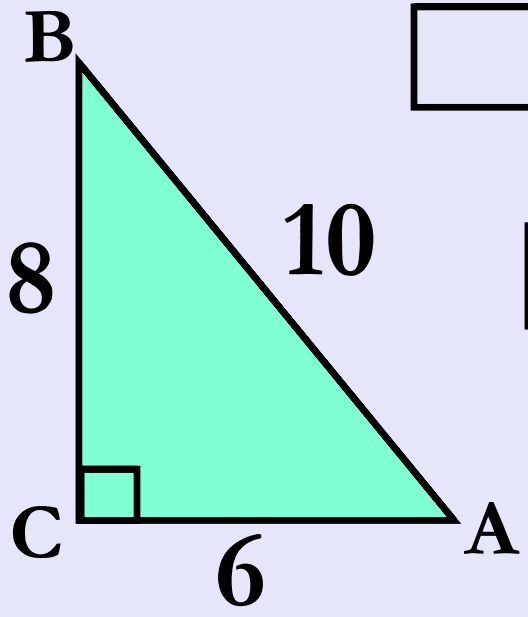
Using the following triangle, match the trigonometry functions with its correct ratio!

Erase under each box to check your answers!!!




$\square = \frac{6}{8}$

$\square = \frac{8}{10}$

$\square = \frac{8}{6}$

$\square = \frac{6}{10}$

$\square = \frac{8}{10}$

$\square = \frac{6}{10}$

cos A  sin A  cos B

sin B  tan A  tan B

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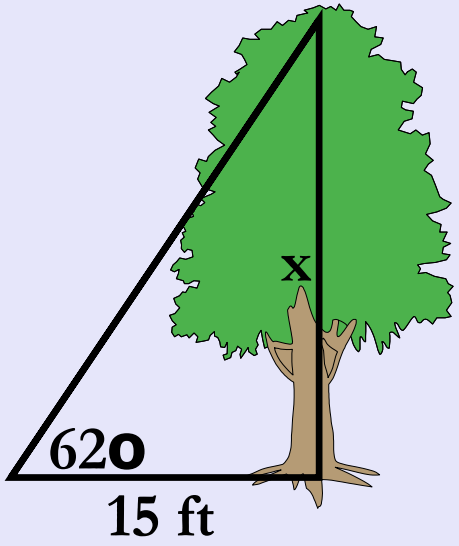
# Word Problems

| sin | cos |
|---|---|
| tan | = |

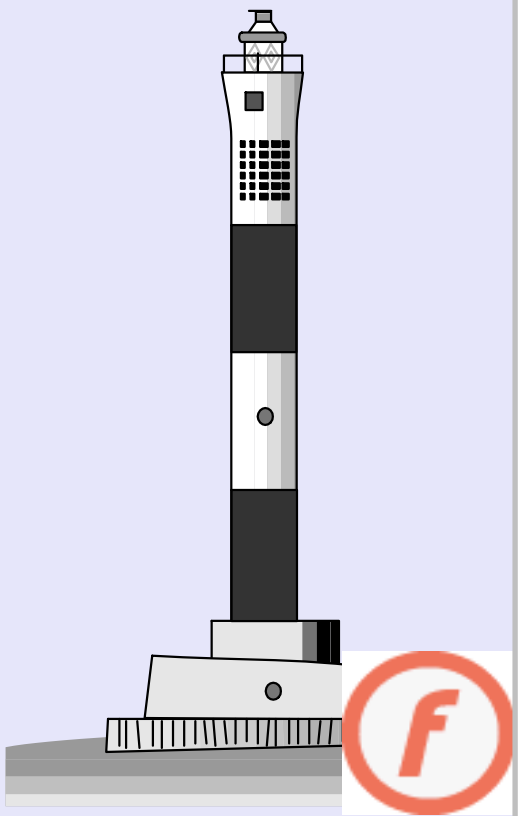
Find, to the *nearest tenth of a foot*, the height of the tree represented in the accompanying diagram.




(not drawn to scale)

Draw a diagram that depicts, a ladder leaning against a lighthouse makes an angle of 58° with level ground. If the distance from the foot of the ladder to the building is 6 feet, find, to the *nearest foot*, how far up the building the ladder will reach.

| 58o | 6 ft | tan |
|---|---|---|
| sin | cos | = x |



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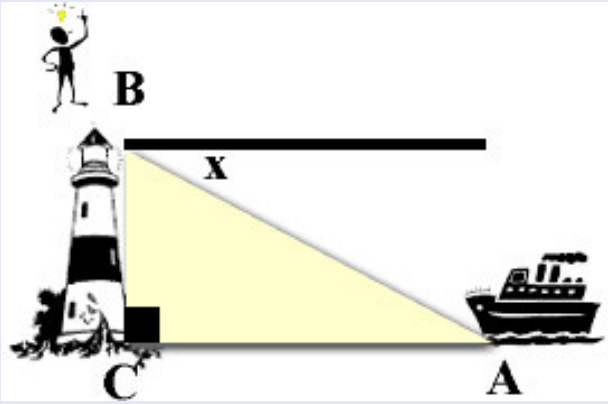
A person measures the angle of depression from the top of a wall to a point on the ground. The point is located on level ground 62 feet from the base of the wall and the angle of depression is 52°. How high is the wall, to the *nearest tenth of a foot*?

**Remember!!**

The **angle of depression** is always **OUTSIDE** the triangle. It is never inside the triangle.




| sin | cos | tan |
|---|---|---|
| 52o | 62 ft | = x |

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Practice Page

# Working with Right Triangles

Math A

## Trig Twisters

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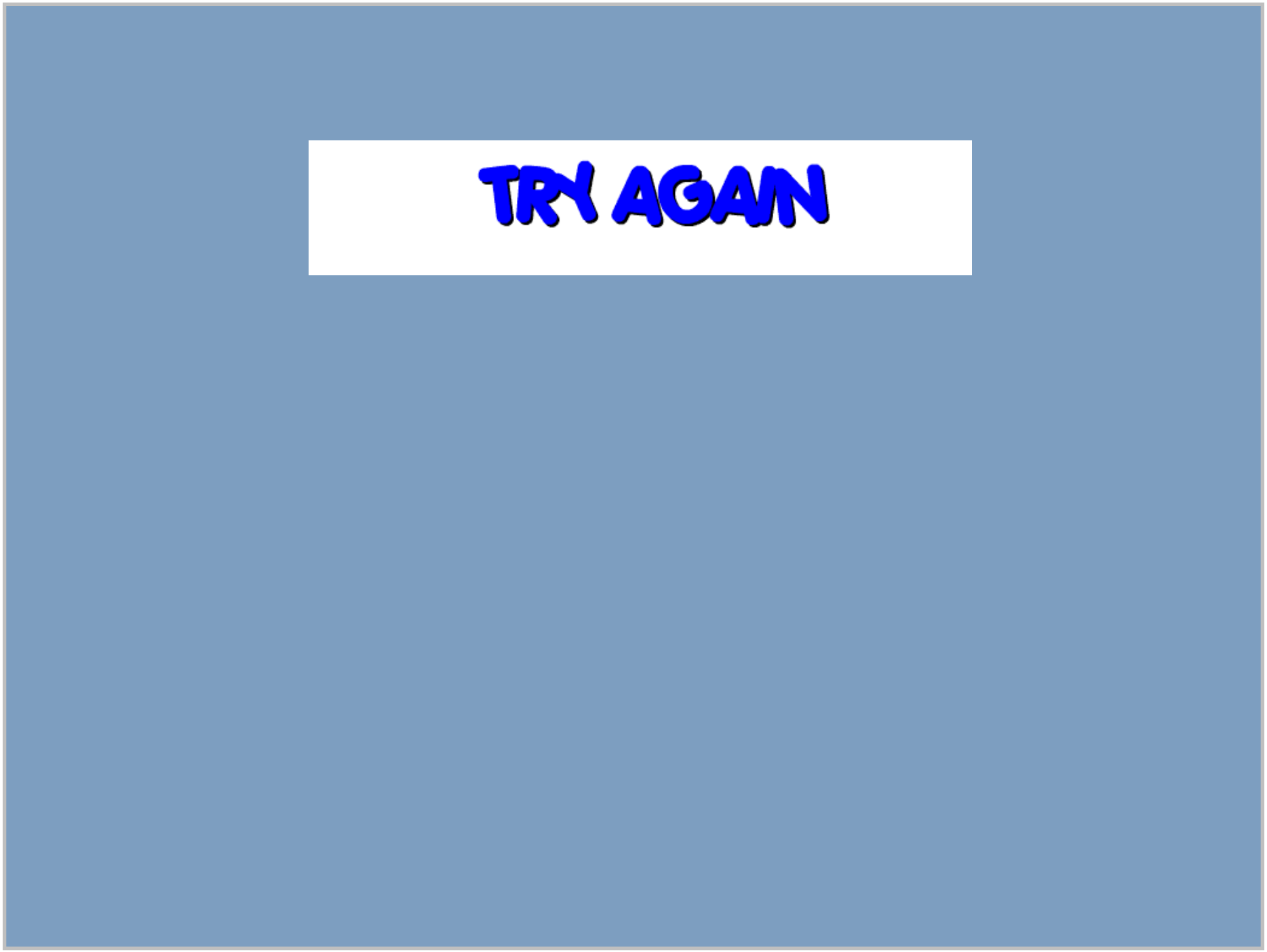
TRY AGAIN


GOOD JOB!

# The End!

TrigTwisters.pdf