"SINE, COSINE, AND TANGENT: SOH CAH TOA"
problems

Brief answers to these problems are available in the Answers document.
Full solutions to the problems are available in the Solutions document, and in the YouTube videos.
You can find links to these resources at my website:
http://www.freelance-teacher.com/videos.html
Links to the documents are also in the video description boxes for the YouTube videos.

You can support these resources with a monthly pledge of $1 (or more) at my Patreon page: http://www.patreon.com/freelanceteacher

This video series is intended for students who find this material to be difficult, so in the videos I proceed slowly and repeat myself a lot. If you find the videos to move too slowly, you can simply try the problems in this Problems document, study the solutions in the Solutions document, and skip to any particular parts of the videos that cover aspects of the solutions that you find confusing.
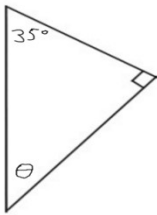
Problems begin on the next page.
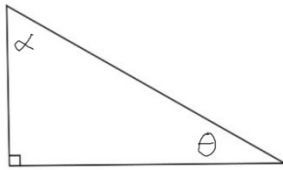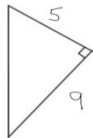
Video (1)

Problem:

80°

70°   ? = θ

Find θ.

Problem:

35°

θ

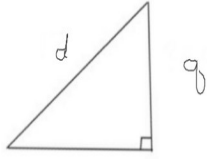Find θ.
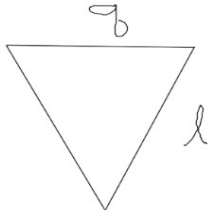
Problem:

α

θ

Find α.

Problem:

5

9
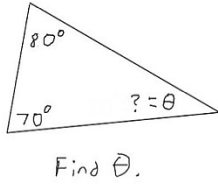
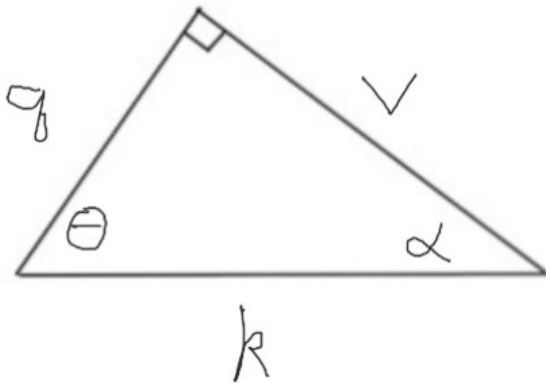Find the length of the remaining side of the triangle, if possible.

Problem:

Find the length of the missing side.

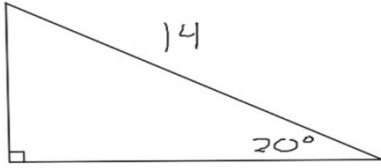Problem:

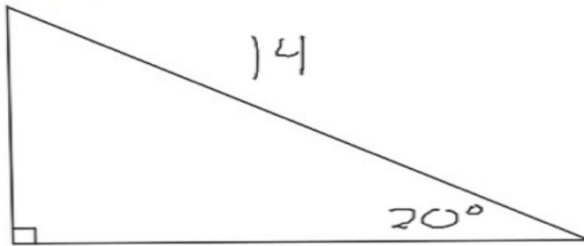Find the length of the missing side, if possible.

Problem

(a) Find sin θ, cos θ, and tan θ.
(b) Find sin α, cos α, and tan α.

Problem:

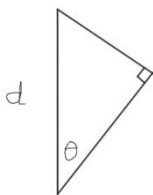Find the lengths of the missing sides.

Problem:

Now redo the previous problem. But this time, use the angle at the top of the triangle, rather than the 20° angle at the bottom of the triangle.
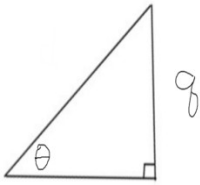Find the lengths of the missing sides.

True or false? If false, reword the sentence so that it is true:
"You should use cosine to find the horizontal leg of a right triangle, and use sine to find the vertical leg of a right triangle."
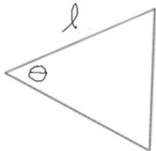
Problem:

Find the lengths of the missing sides, if possible.
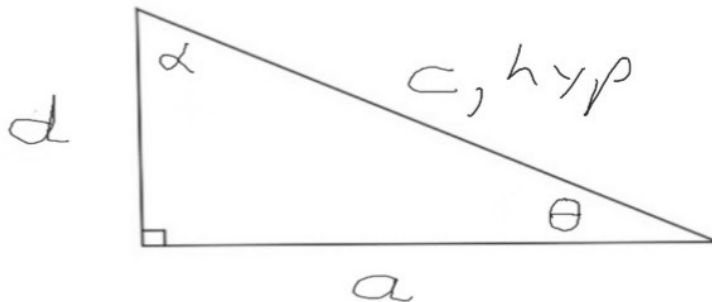
Problem:

Find the lengths of the missing sides, if possible.

Problem:

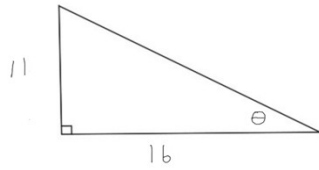Find the lengths of the missing sides, if possible.

Problem:

Label the "hypotenuse", "opposite", and "adjacent" sides in the above right triangle.

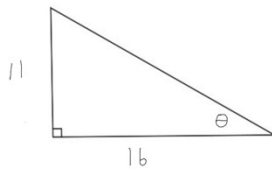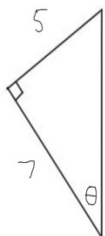# Video (2)

Problem:

11

16

Find θ, if possible.
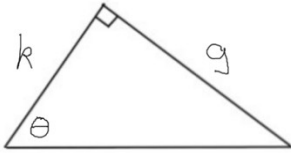
Problem:

11

16

Redo the previous problem. But this time, find θ by first determining the angle at the top of the triangle.
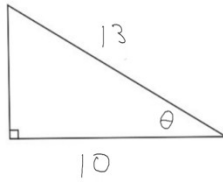
Problem:

5

7

θ

(a) Find θ.
(b) Find the length of the missing side.

Problem:

(a) Find θ.
(b) Find the length of the missing side.

Problem:

(a) Find θ.
(b) Find the length of the missing side.

SUMMARY
Fill in the blanks.

A triangle is:

The sum of the angles in a triangle is:

A right triangle is:

The sum of the acute angles in a right triangle is: ̲

The hypotenuse of a right triangle is:

The legs of a right triangle are:

The longest side of a right triangle is:

Pythagorean theorem:

Slogan for remembering sine, cosine, and tangent:

Which side is "opposite" and which side is "adjacent" depends on which angle you are focusing on.

Remember that the Pythagorean theorem and SOH CAH TOA apply to right triangles only.

If $\cos \theta = q$, $\sin \theta = p$, and $\tan \theta = r$, then:
$\cos^{-1}$
$\sin^{-1}$
$\tan^{-1}$

SUMMARY continued
Fill in the blanks.

When comparing two sides of a triangle, the longer side is

When you know one side and one acute angle of a right triangle,

When you know two sides of a right triangle,

Video (3)

A package starts from rest and slides with constant acceleration down a 30° ramp that has a vertical drop of 0.9 m as shown in the figure. The package slides from the top to the bottom of the ramp in 3 seconds. Determine the magnitude and direction of the package's acceleration.