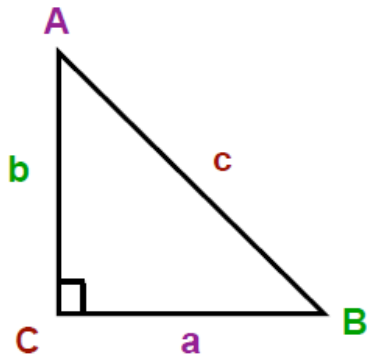
Right Triangle Trigonometry
Trigonometric Ratios
(SOH-CAH-TOA)

Trigonometry - a branch of mathematics that studies the relationships between the sides and angles of triangles.

Trigonometric ratio - the ratio between two sides of a right triangle.

There are 3 "trig ratios" that we will study.
The ratios are called sine, cosine, and tangent.

They are abbreviated sin, cos, and tan respectively (locate these buttons on your calculator).



What do these trig ratios stand for?

$$\sin x = \frac{\text{opposite side}}{\text{hypotenuse}}$$

SOH

$$\cos x = \frac{\text{adjacent side}}{\text{hypotenuse}}$$

CAH

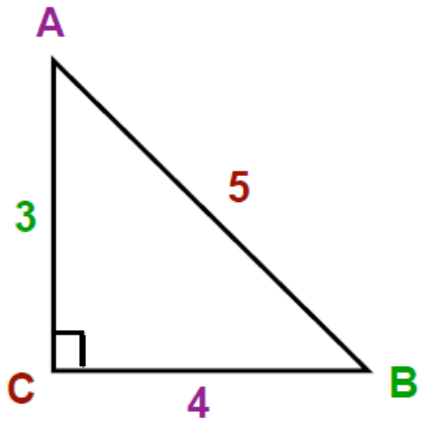
$$\tan x = \frac{\text{opposite side}}{\text{adjacent side}}$$

TOA

The mnemonic device to remember the 3 trig ratios is

"SOH-CAH-TOA"

SOHCAHTOA

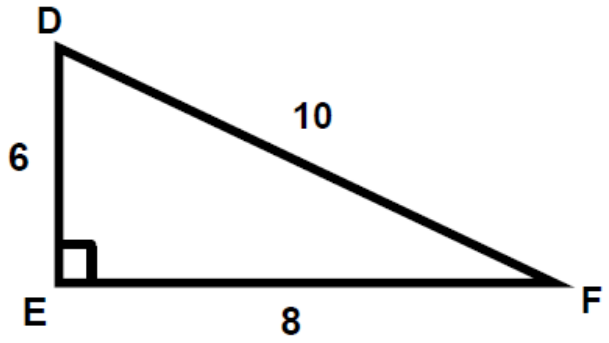


Example 1: Let's look at <A.

Find the side opposite, side adjacent, and the hypotenuse for <A.

Then write the sin A, cos A, and tan A ratios.

Example 2

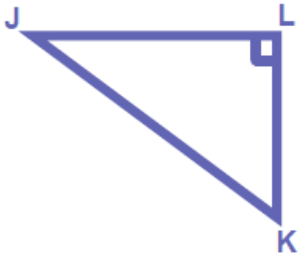


Find sin F, cos F, and tan F.

What is the side opposite of <J?

What is the hypotenuse of the triangle?

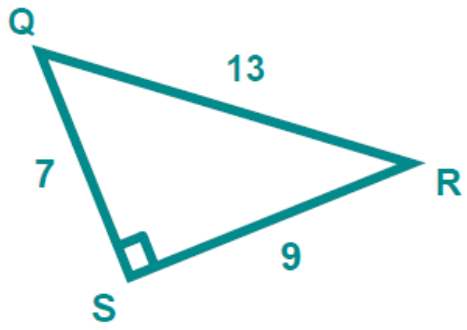
What is the side adjacent to <J?



What is sin R?

What is cos R?

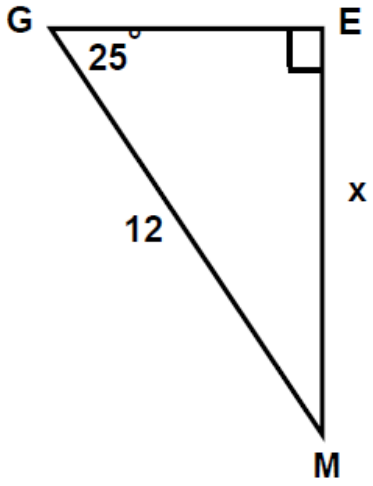
What is tan R?

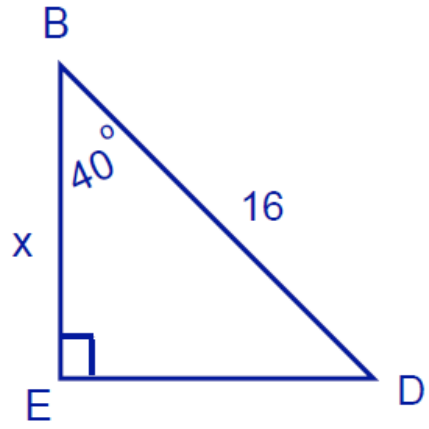


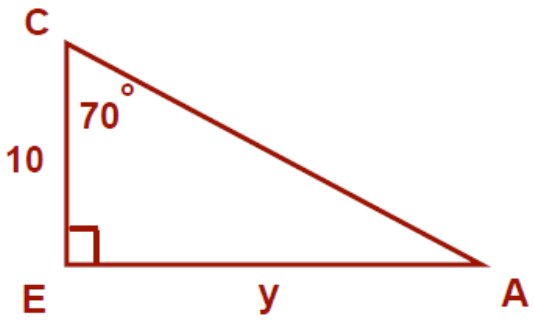
Using Trigonometric Ratios to find side lengths

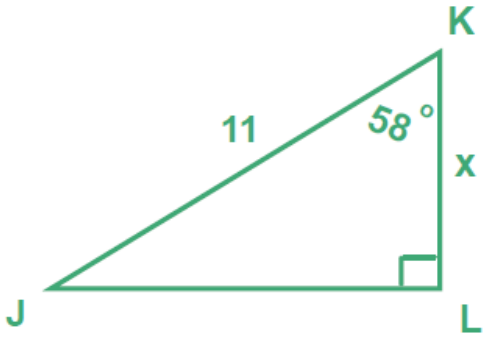
(You will need a calculator for this)

Solve for the missing side lengths:

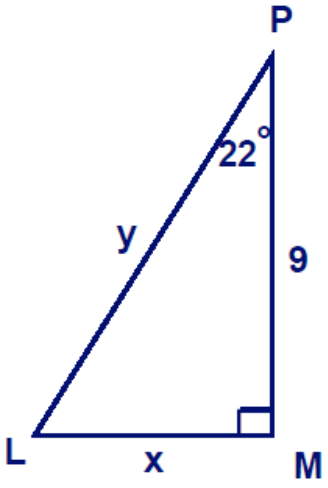




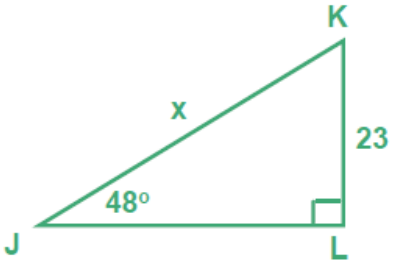


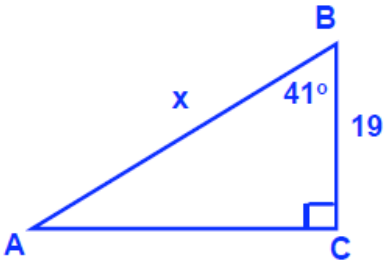


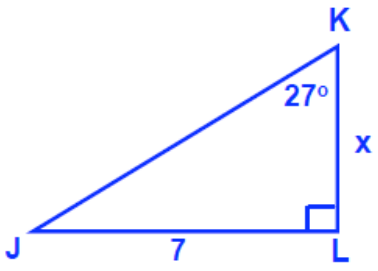
Solve for the missing side lengths:

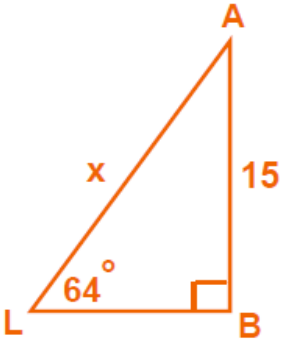


How do we solve if the variable is in the denominator of the fraction?









SOH-CAH-TOA … Set 2

Label each triangle with adjacent, opposite and hypotenuse.

Then decide which formula you would use.

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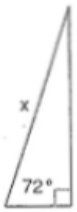

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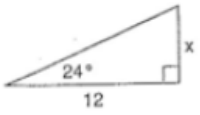

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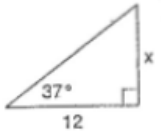

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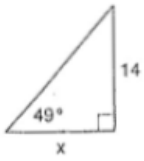

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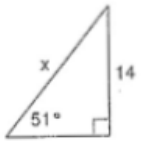

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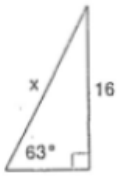

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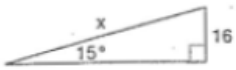
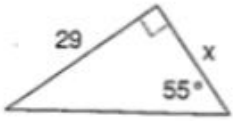


SOH-CAH-TOA … Set 2

9)



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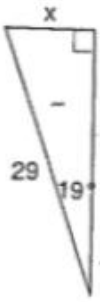

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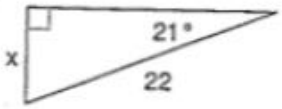

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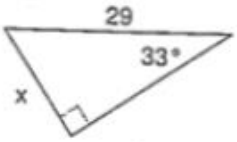

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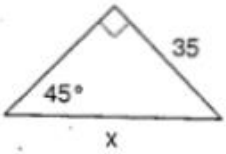

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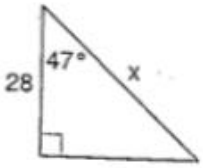

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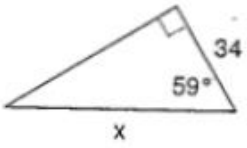


Using Inverse Trigonometric Ratios to find angle measures

(You will need a calculator for this)

In this section you will need to use the inverse trig functions to solve for missing angles. Just as the following are inverses and undo each other,

Addition $\xleftrightarrow{\text{inverse}}$ Subtraction

Multiplication $\xleftrightarrow{\text{inverse}}$ Division

Square $\xleftrightarrow{\text{inverse}}$ Square Root

so does a trig ratio and its inverse.

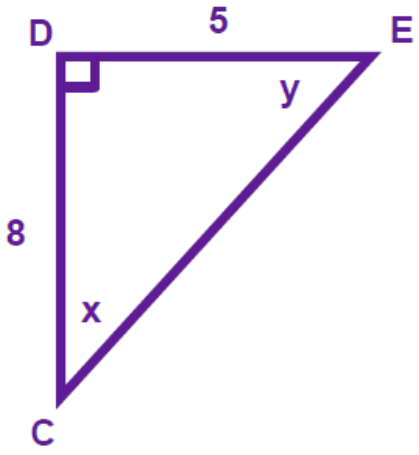
$\sin\theta \xleftrightarrow{\text{inverse}} \sin^{-1}\theta$

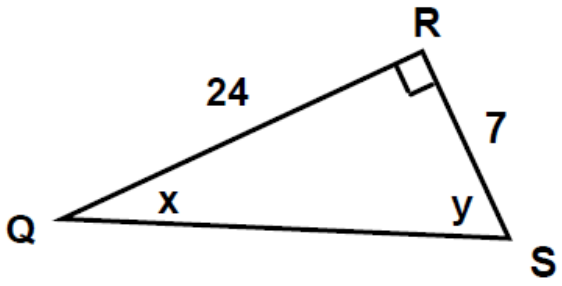
$\cos\theta \xleftrightarrow{\text{inverse}} \cos^{-1}\theta$

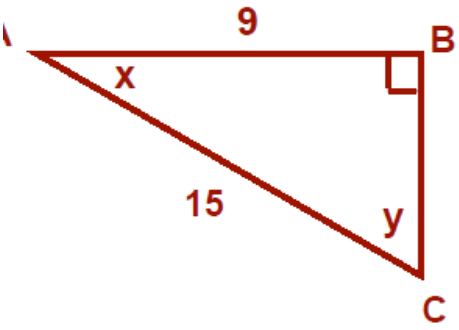
$\tan\theta \xleftrightarrow{\text{inverse}} \tan^{-1}\theta$

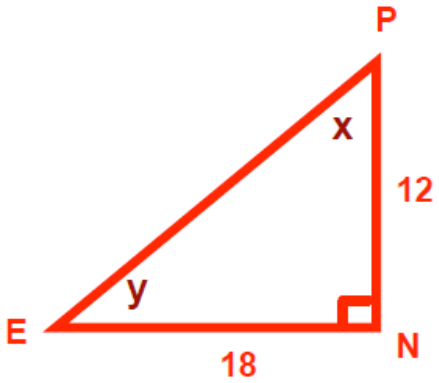
"To find the degree, use the inverse key"

Solve for the missing angle measures:









Find the measure of each angle indicated. Round to the nearest tenth.

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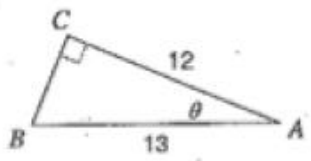

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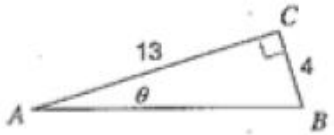

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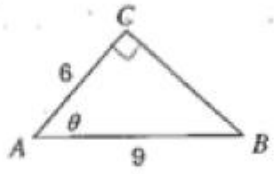

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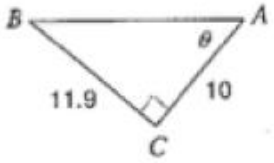

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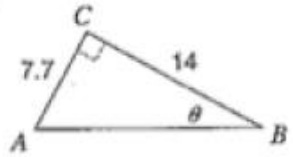

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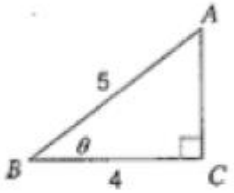

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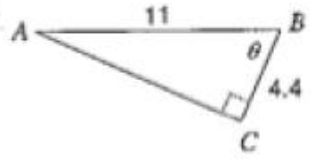

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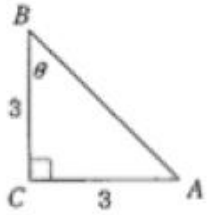
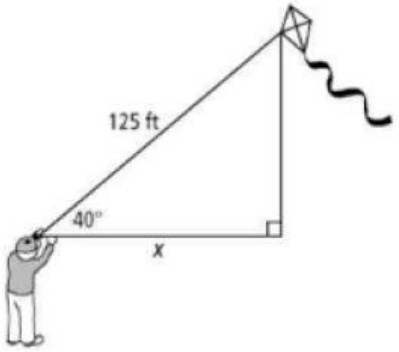


SOH-CAH-TOA … Set 2

Find the value of x. Round to the nearest tenth of a unit.

9.



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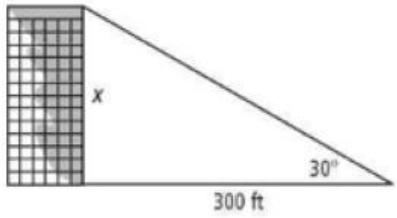

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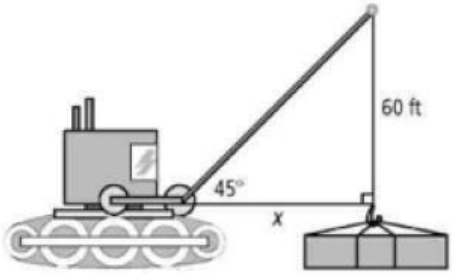

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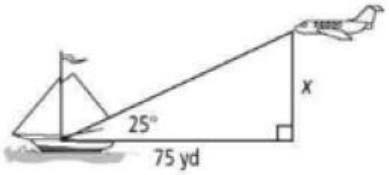
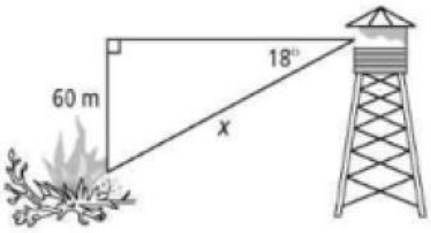


Find the value of x. Round to the nearest tenth of a unit.

16.



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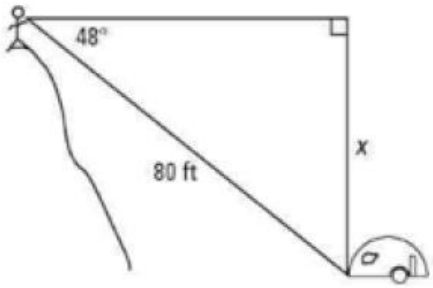

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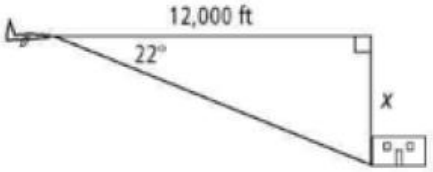

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