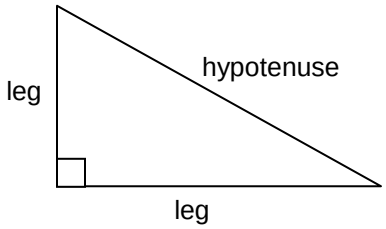
Lesson T-1 Trig Definitions Name: _____

We already know that right triangles are important because the Pythagorean relationship applies to them in a special way. (The sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.) Right triangles are important for other reasons, too, which we will begin to explore in the activity after this one. But first, let's learn the vocabulary we will need, and practice using it.



The most common way to label the sides of right triangles is to call the two sides that form the right angle the legs, and the remaining side (the longest one) the hypotenuse. This labeling system does not allow us to distinguish one leg from the other. Mathematicians have developed a way to tell the legs apart based on their position relative to one of the acute angles in the triangle. The words they use to describe the legs are **opposite** and **adjacent**.

First, let's look at the term *opposite*. Every side is opposite, or across from, one of the angles of the triangle. In fact, the smallest side is always opposite the smallest angle, the medium side is always opposite the medium angle, and the longest side is always opposite the largest angle. (See Diagram 1.)

Diagram 1

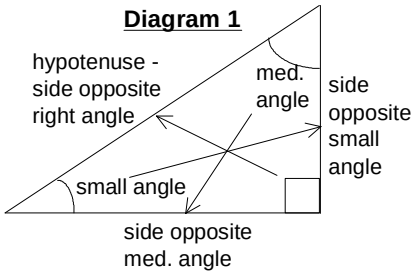
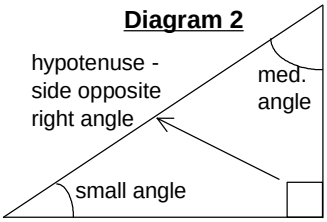


Diagram 2



Since the longest side of the triangle will always be opposite the largest angle (the right angle) that side has a special name, the hypotenuse. (See Diagram 2.)

Now let's examine the term *adjacent*. In normal English, the word adjacent means "next to." That is the same sense that we use the word here. Each angle actually has two sides that are adjacent, or next to it. One of those sides is already called the hypotenuse, so the other one is the one that gets the name *adjacent*. (See Diagram 3.)

Diagram 3

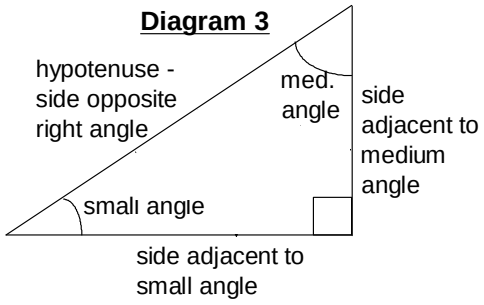
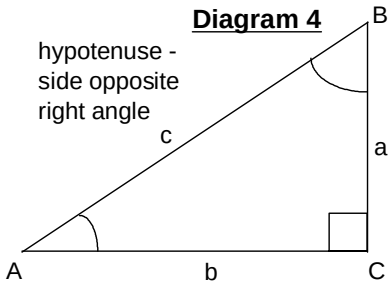


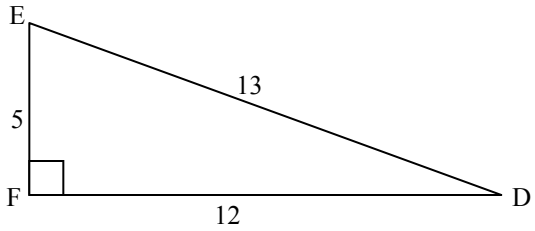
Diagram 4



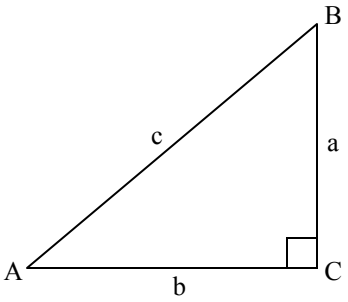
Let's review what we've learned. The longest side of the triangle, which is opposite the right angle, is always called the hypotenuse. The two legs of the triangle (the sides that form the right angle) are each *opposite* one of the angles, and *adjacent* to the other. For example, in Diagram 4 leg *a* is *opposite* angle A and *adjacent* to angle B. Leg *b* is *opposite* angle B and *adjacent* to angle A.

Let's practice using this vocabulary with some sample right triangles.

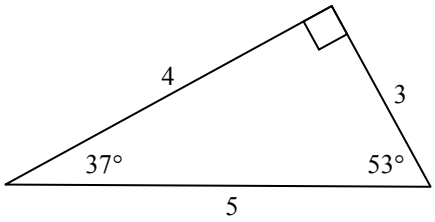
1. How long is the *hypotenuse*? _____
   How long is the side *opposite* angle D? _____
   How long is the side *adjacent* to angle D? _____
   How long is the side *opposite* angle E? _____
   How long is the side *adjacent* to angle E? _____



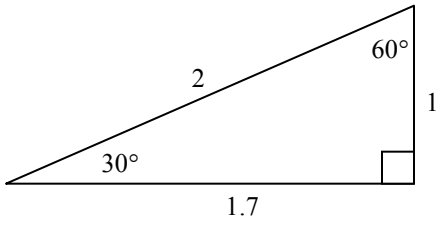
2. How long is the *hypotenuse*? _____
   How long is the side *opposite* angle A? _____
   How long is the side *adjacent* to angle A? _____
   How long is the side *opposite* angle B? _____
   How long is the side *adjacent* to angle B? _____



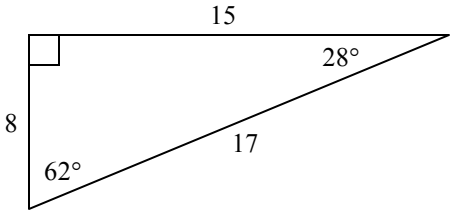
3. How long is the *hypotenuse*? _____
   How long is the side *opposite* the 53° angle? _____
   How long is the side *adjacent* to the 53° angle? _____
   How long is the side *opposite* the 37° angle? _____
   How long is the side *adjacent* to the 37° angle? _____



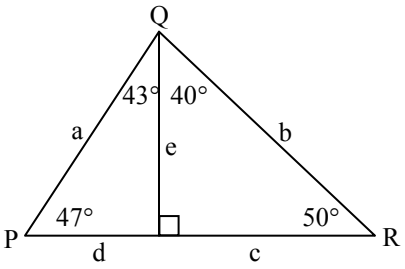
4. How long is the *hypotenuse*? _____
   How long is the side *opposite* the 30° angle? _____
   How long is the side *adjacent* to the 60° angle? ___
   How long is the side *opposite* the 60° angle? _____
   How long is the side *adjacent* to the 30° angle? ___



5. How long is the *hypotenuse*? _____
   How long is the side *opposite* the 28° angle? _____
   How long is the side *adjacent* to the 28° angle? ____
   How long is the side *opposite* the 62° angle? _____
   How long is the side *adjacent* to the 62° angle? ____



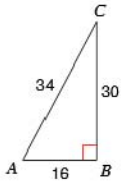
6. How long is the *hypotenuse* of the right triangle on the left? _____
   How long is the *hypotenuse* of the right triangle on the right? _____
   How long is the side *opposite* the 43° angle? _____
   How long is the side *adjacent* to the 43° angle? _____
   How long is the side *opposite* the 50° angle? _____
   How long is the side *adjacent* to the 50° angle? _____
   How long is the side *opposite* the 47° angle? _____
   How long is the side *adjacent* to the 40° angle? _____



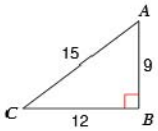
Mastery Alg 1 Practice T-1 Name_____

Find each trigonometric ratio using SOH-CAH-TOA. Give each answer as a reduced fraction.

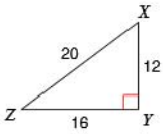
1) tan A



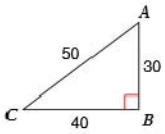
2) cos C



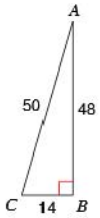
3) sin Z



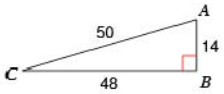
4) sin C



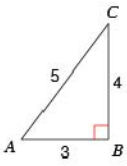
5) sin C



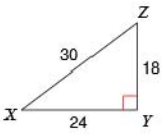
6) sin C



7) cos A

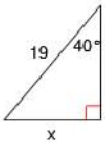


8) cos X



Use Trig to find the missing side. Round to the nearest tenth.

9)



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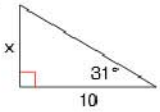

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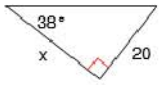

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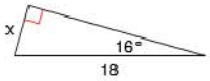

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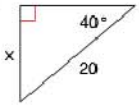

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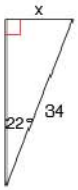

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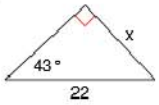

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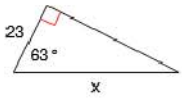

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