Tutorial: Trigonometric Ratios

Slide 2:

We just talked about the different aspects of a right triangle. We discussed the legs of the right triangle, the hypotenuse, and what it means to have opposite and adjacent sides.
Now we are going to discuss the first three trigonometric ratios.
The first one is Sine written as s-i-n or sine of theta, where theta is some angle either measured in either degrees or radians.
The second is Cosine written as c-o-s or cosine of theta.
The third is Tangent written as t-a-n or tangent of theta.

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Let's look at how sine, cosine, and tangent relate to the right triangle.
We can start with sine.
First, notice that the angle theta is now marked on the triangle. It is by point A. This will be the angle that we are going to reference throughout the rest of this discussion.
Sine of the angle defined as the opposite side over, or divided by, the hypotenuse.
In this case sine of theta is equal to a over c, since a is opposite of angle theta and c is the hypotenuse.

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Now that we have learned about sine let's move on to cosine.
Again we are going to use angle theta.
Cosine of an angle is defined as the adjacent side over, or divided by, the hypotenuse.
In this triangle cosine of theta is equal to b divided by c.

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Now let's take a look at the tangent function.
We are still using angle theta.
Tangent of an angle is defined as the opposite side over, or divided by, the adjacent side.
In this triangle tangent of theta is equal to a over b.

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One easy way to remember the trigonometric ratios is SOH-CAH-TOH.
SOH stands for sine, opposite, hypotenuse.
CAH stands for cosine, adjacent, hypotenuse.
TOA stands for tangent, opposite, adjacent.

Slide 7:

Let's look at an example.
In this triangle the two legs measure 3 and 4 units and the hypotenuse measures 5 units.
Sin of A equals 4 over 5.
Cos of A equals 3 over 5.
Tangent of A equals 4 over 3.
Notice that if you want to find the trigonometric ratios of a different angle within the same triangle then the answers will change.
Sin of B equals 3 over 5.
Cos of B equals 4 over 5.
Tangent of B equals 3 over 4.