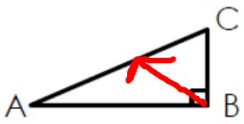
$\sin \angle A =$ length of leg opposite $\angle A$ / length of the hypotenuse.

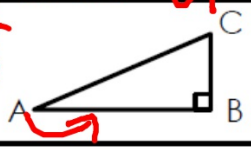
The leg OPPOSITE $\angle A$ is $\overline{BC}$.

The HYPOTENUSE is $\overline{AC}$

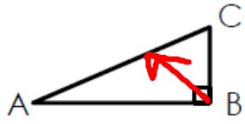


$$\cos \angle A = \frac{\text{length of leg adjacent to } \angle A.}{\text{Length of the hypotenuse.}}$$

The leg ADJACENT to $\angle A$ is $\overline{AB}$.



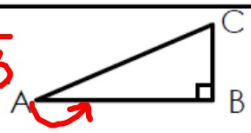
The HYPOTENUSE is $\overline{AC}$



$$\tan \angle A = \frac{\text{length of leg opposite } \angle A.}{\text{length of leg adjacent to } \angle A.}$$

The leg OPPOSITE $\angle A$ is $\overline{BC}$.

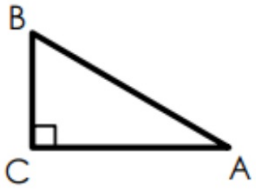
The leg ADJACENT to $\angle A$ is $\overline{AB}$.



Sine Ratio

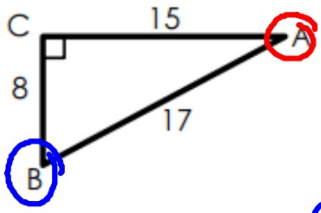
Let ΔABC be a right triangle with acute $\angle A$. The sine of $\angle A$ (written as sin A) is defined:

$$\sin A = \frac{\text{leg opposite}}{\text{Hypotenuse}} = \frac{\overline{CB}}{\overline{BA}}$$



Example 1: Find sine ratios.

Find sin A and sin B. Write each answer as a fraction and as a decimal. Round to four decimal places, if necessary.



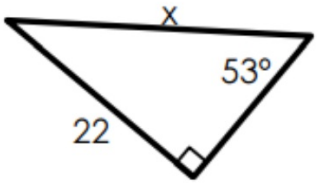
$$\text{Sin } A = \frac{\overline{CB}}{\overline{BA}} = \frac{8}{17} = 0.47$$

$$\text{Sin } B = \frac{\overline{CA}}{\overline{BA}} = \frac{15}{17} = 0.88$$

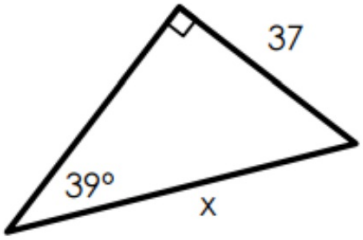
Example 2: Using sine.

Use a sine ratio to find the value of x. Round decimals to the nearest tenth.

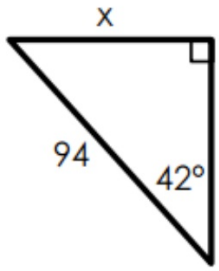
a)



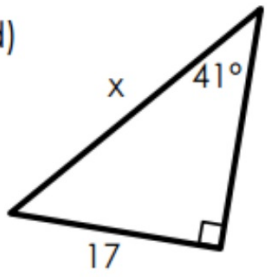
b)



c)



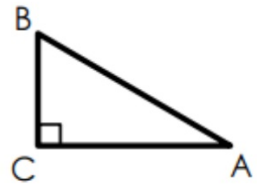
d)



Cosine Ratio

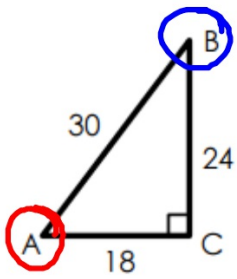
Let ΔABC be a right triangle with acute $\angle A$. The cosine of $\angle A$ (written as cos A) is defined:

$$\cos A = \frac{\text{leg adjacent}}{\text{hypotenuse}} = \frac{\overline{AC}}{\overline{BA}}$$



Example 1: Find cosine ratios.

Find cos A and cos B. Write each answer as a fraction and as a decimal. Round to four decimal places, if necessary.



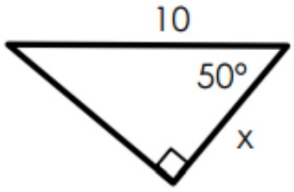
$$\cos A = \frac{\overline{CA}}{\overline{AB}} = \frac{18}{30} = 0.6$$

$$\cos B = \frac{\overline{BC}}{\overline{AB}} = \frac{24}{30} = 0.8$$

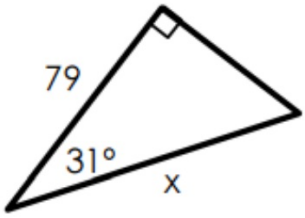
Example 2: Using cosine.

Use a cosine ratio to find the value of x. Round decimals to the nearest tenth.

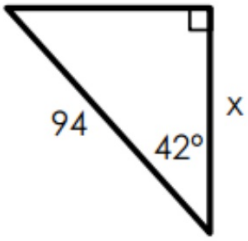
a)



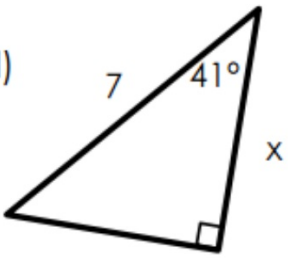
b)



c)



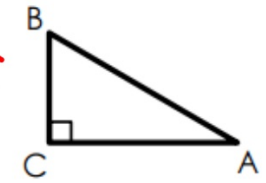
d)



Tangent Ratio

Let ΔABC be a right triangle with acute $\angle A$. The tangent of $\angle A$ (written as tan A) is defined:

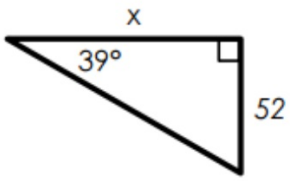
$$\tan A = \frac{\text{leg opposite}}{\text{leg adjacent}} = \frac{\overline{BC}}{\overline{AC}}$$



Example 1: Find tangent ratios

Find the value of x to the nearest tenth.

a)



b)