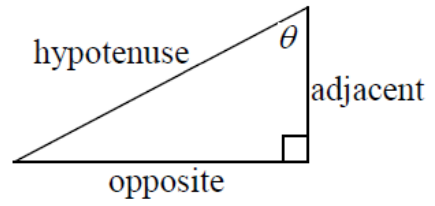
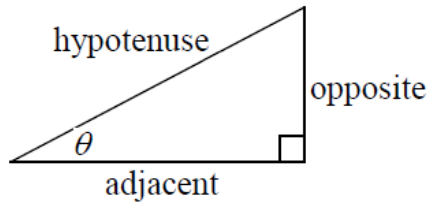


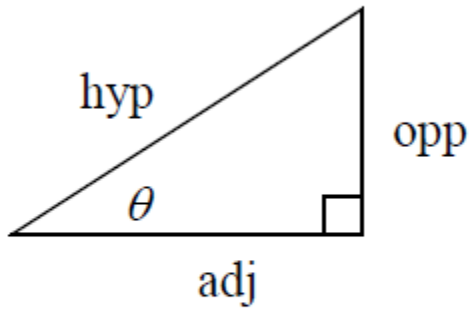
Name _____

Date _____

Trigonometric Ratios



Three Trigonometric Ratios



$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

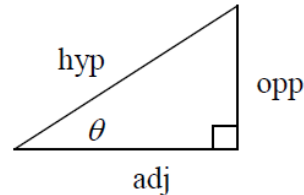
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Using Our Three Trigonometric Ratios, Part 1

In the last section we learned about three trigonometric ratios (sine, cosine and tangent) that can be applied to right-angle triangles.

$$\sin \theta = \frac{\text{opp}}{\text{hyp}} \quad \cos \theta = \frac{\text{adj}}{\text{hyp}} \quad \tan \theta = \frac{\text{opp}}{\text{adj}}$$

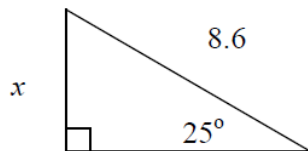


Some learners struggle remembering these three formulas. Here are two common memory tricks that you may wish to use.

1. Use the acronym SOH-CAH-TOA
2. Remember the saying “Some **O**fficers **H**ave **C**urly **A**uburn **H**air **T**ill **O**ld **A**ge”

Example 1

Determine x .

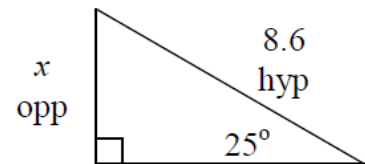


Answer:

Start by labeling the two sides that have been identified in the question.

Since you are working with the opposite side and the hypotenuse, we must use the sine ratio because it is the only formula that works with both the opposite side and hypotenuse.

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$



Now substitute the two known values (25° and 8.6) and the unknown variable (x) into the equation.

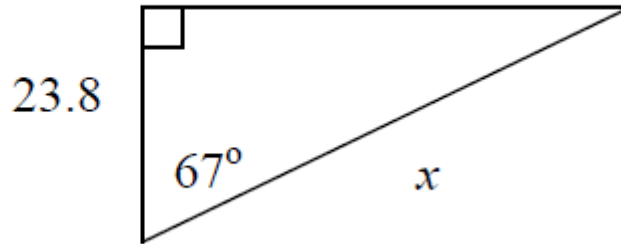
$$\sin 25^\circ = \frac{x}{8.6}$$

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Example 2

Determine x .

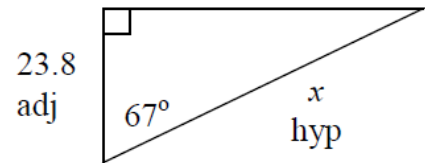


Answer:

Label the sides identified in the question.

Since we are dealing with the adjacent side and the hypotenuse, we need to work with the cosine ratio.

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

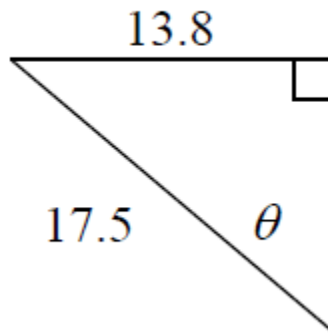


Substitute the known values and the unknown variable into the equation.

$$\cos 67^\circ = \frac{23.8}{x}$$

Example 3

Determine θ .



Name _____

Date _____

Answer:

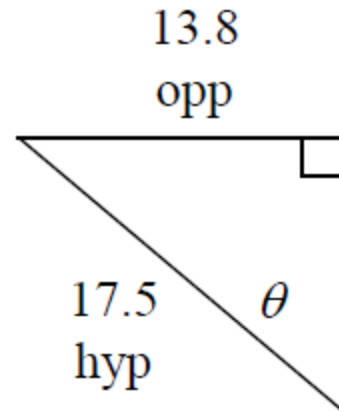
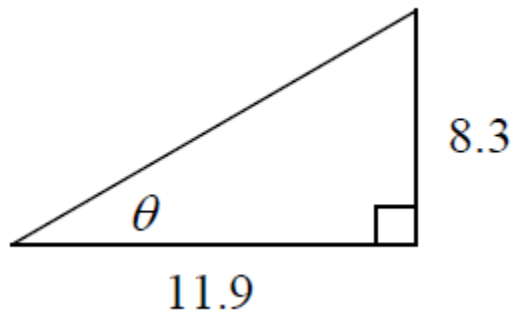
Label the sides.

Use the sine ratio.

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\sin \theta = \frac{13.8}{17.5}$$

$$\sin \theta = 0.789$$

**Example 4**Determine θ .

Name _____

Date _____

Answer:

Label the sides.

Use the tangent ratio.

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan \theta = \frac{8.3}{11.9}$$

$$\tan \theta = 0.697$$

$\tan^{-1}(0.697)$ 34.87649691

$$\theta = 35^\circ$$

