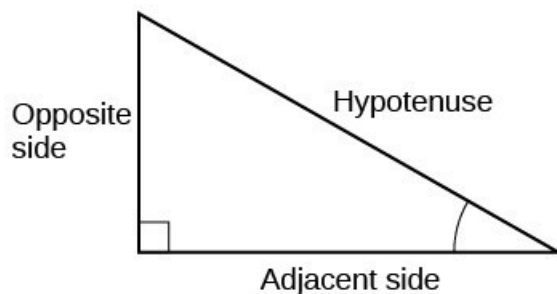


THEORETICAL PART:**Definition (Sine, Cosine, and tangent):**

Assume θ is one of the acute (less than a right angle) angles in a right triangle, and let adj and opp stand for, respectively, the lengths of the legs adjacent to and opposite θ . Let hyp stand for the length of the hypotenuse of the right triangle. Then the **sine**, **cosine**, and **tangent** of θ , are the ratios

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

**Definition (Cosecant, Secant, and Cotangent)**

Assume θ is one of the acute angles in a right triangle. Then the **cosecant**, **secant**, and **cotangent** of θ , are the reciprocals of $\sin \theta$, $\cos \theta$, and $\tan \theta$. That is,

$$\csc \theta = \frac{1}{\sin \theta} = \frac{hyp}{opp}, \quad \sec \theta = \frac{1}{\cos \theta} = \frac{hyp}{adj}, \quad \cot \theta = \frac{1}{\tan \theta} = \frac{adj}{opp}.$$

Definition (Degree, Minute, and Second Notation):

In the context of angle measure,

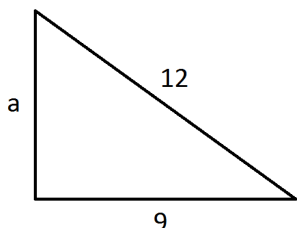
$$1' = \text{one minute} = \left(\frac{1}{60}\right)(1^\circ)$$

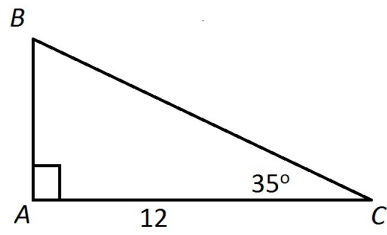
and

$$1'' = \text{one second} = \left(\frac{1}{60}\right)(1') = \left(\frac{1}{3600}\right)(1^\circ).$$

PRACTICAL PART:

1. Use the information contained in the two figures to determine the values of the six trigonometric functions of θ .





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2. Evaluate the tangent and secant of $\theta = \frac{\pi}{4}$.
3. Use a calculator to evaluate the following expressions.
- a. $\sin(56.4^\circ)$
 - b. $\cot(5\pi/11)$
4. The manufacturer of a certain brand of 16-foot ladder recommends that, when in use, the angle between the ground and the ladder should equal 75° . What distance should the foot of the ladder be from the base of the wall it is leaning against?