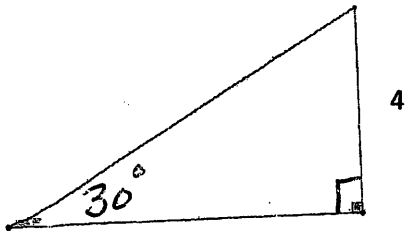
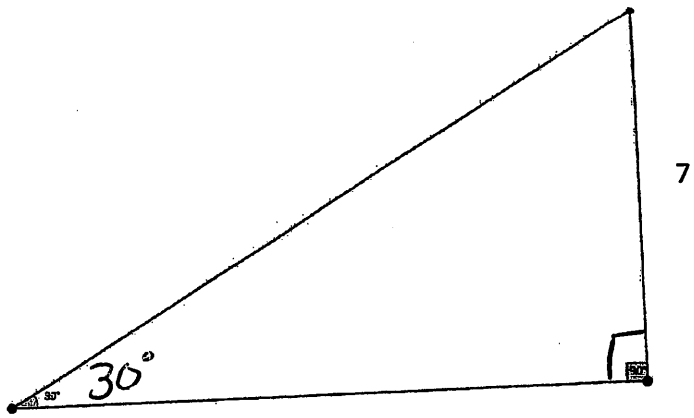
Geometry **Trigonometric Ratios** **Name**_____

Review Similar Triangles





Are the triangles similar? Why or why not?

What type of triangles are they?

What is the length of the hypotenuse of each triangle?

What is ratios of the given legs to their hypotenuses?

Trigonometry is a branch of mathematics that studies relationships involving lengths and angles of triangles.

A **Trigonometric Ratio** is a ratio (relationship between 2 numbers, e.g. fraction) of the lengths of 2 sides of a right triangle of a certain angle. The three basic trigonometric ratio are sine, cosine, and tangent. They are abbreviated as **sin, cos**, and **tan**.

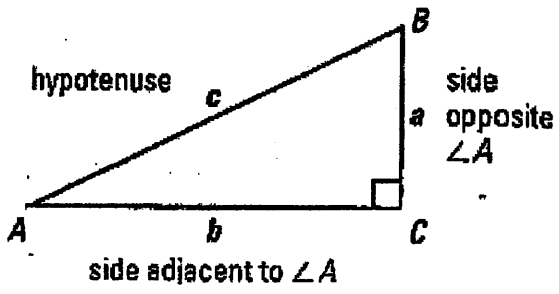
Trigonometric Ratios:

Let $\triangle ABC$ be a right triangle. The sine, the cosine, and the tangent of the acute angle $\angle A$ are defined as follows.

$$\sin A = \frac{\text{side opposite } \angle A}{\text{hypotenuse}} = \frac{a}{c}$$

$$\cos A = \frac{\text{side adjacent to } \angle A}{\text{hypotenuse}} = \frac{b}{c}$$

$$\tan A = \frac{\text{side opposite } \angle A}{\text{side adjacent to } \angle A} = \frac{a}{b}$$

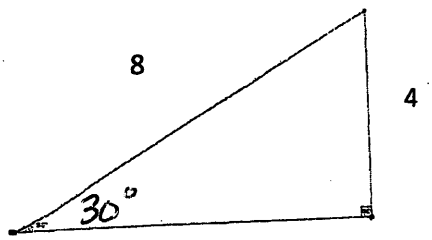


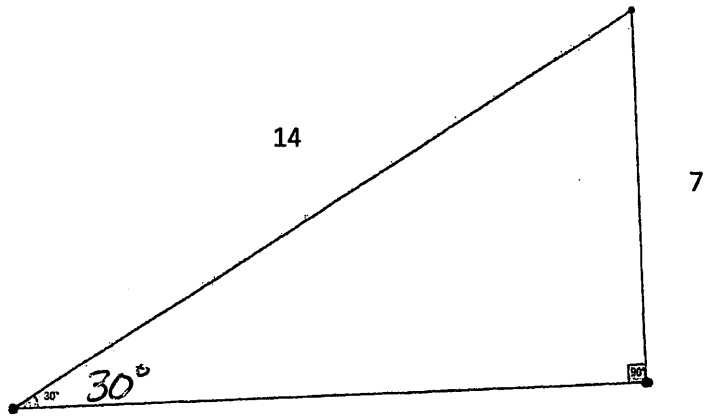
SOH – CAH – TOA

$Sin\ \measuredangle = \frac{Opp}{Hyp}$ $Cos\ \measuredangle = \frac{Adj}{Hyp}$ $Tan\ \measuredangle = \frac{Opp}{Adj}$

Some Old Horse Caught Another Horse Taking Oats Away

Revisit the first triangles



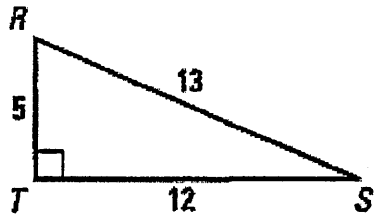


$\sin 30° =$

Example 1

Find the sine, the cosine, and the tangent of the indicated angle.

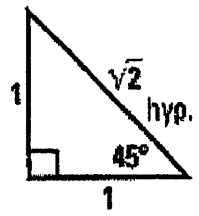
a. $\angle S$ **b.** $\angle R$



$Sin\ \measuredangle = \frac{Opp}{Hyp}$ $Cos\ \measuredangle = \frac{Adj}{Hyp}$ $Tan\ \measuredangle = \frac{Opp}{Adj}$

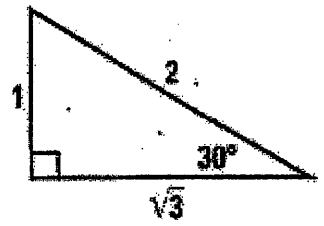
Example 2

Find the sine, the cosine, and the tangent of 45°.



Example 3

Find the sine, the cosine, and the tangent of 30°.



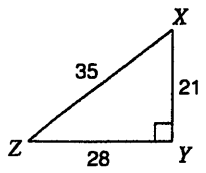
Name_____

Trigonometric Ratios

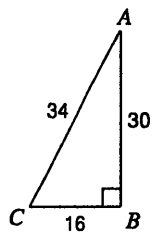
Date_____ Period____

Find the value of each trigonometric ratio.

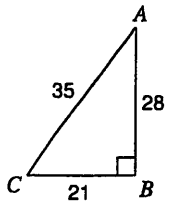
1) tan Z



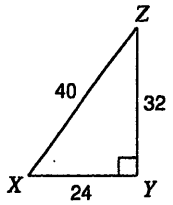
2) cos C



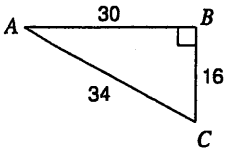
3) sin C



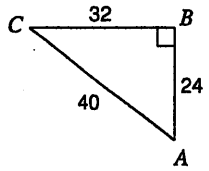
4) tan X



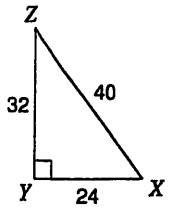
5) cos A



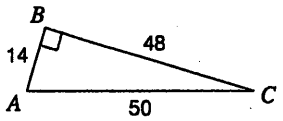
6) sin A



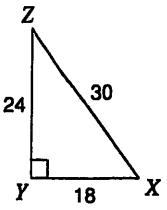
7) sin Z



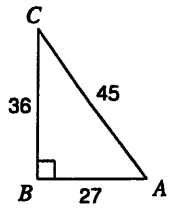
8) sin C



9) cos Z

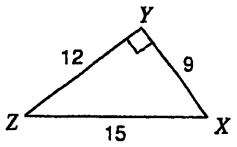


10) tan C

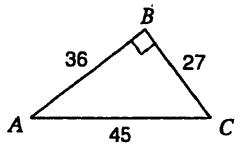


Find the value of each trigonometric ratio to the nearest ten-thousandth.

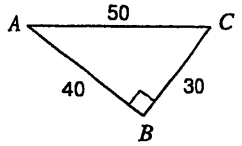
11) cos Z



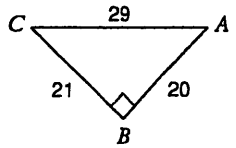
12) cos C



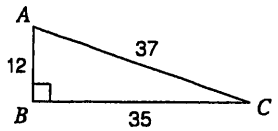
13) tan C



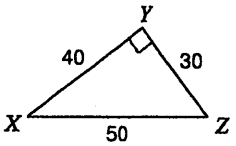
14) tan A



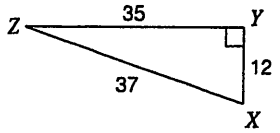
15) tan C



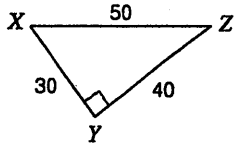
16) tan X



17) sin Z



18) sin Z



19) sin 48°

20) sin 38°

21) cos 61°

22) cos 51°

Critical thinking questions:

23) Can the sine of an angle ever equal 2? Why or why not?

24) $\sin x = \frac{1}{3}$

Find cos x.