



# Geometry

Trigonometry  
(Right Triangles)



# Right Triangle Trigonometry

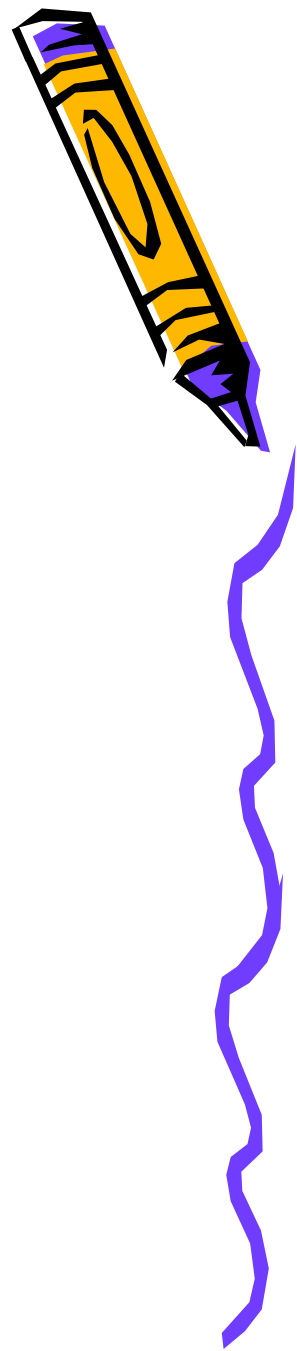
A ratio of the lengths of sides of a right triangle is called a trigonometric ratio

The most common ratios used are:

sine (sin)

cosine (cos)

tangent (tan)



# Vocabulary



Reference Angle:

the angle that is being referred to. we do not use the right angle as a reference angle.

Hypotenuse:

the side opposite the right angle.

Opposite Side:

the side directly across the triangle from the reference angle.

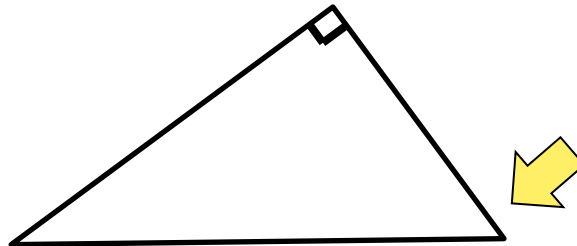
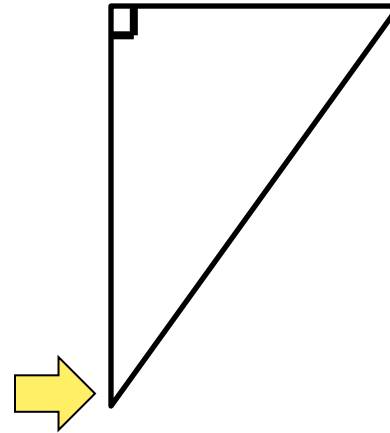
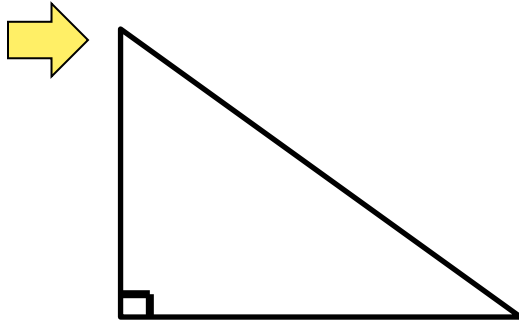
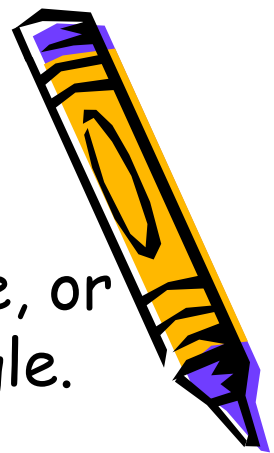
Adjacent Side:

the side next to the reference angle that is not the hypotenuse.



# Right Triangle Trigonometry

Label each triangle's sides as adjacent, opposite, or hypotenuse based on the indicated reference angle.



# Trigonometry



## Calculator Check

Since there are different units for measurement of angles, we need to be sure that our calculator is set to degrees.

Always confirm the setting of the calculator

$$\text{Test: } \sin(30) = 0.5$$

If you get anything other than 0.5 your calculator is not set to degrees.



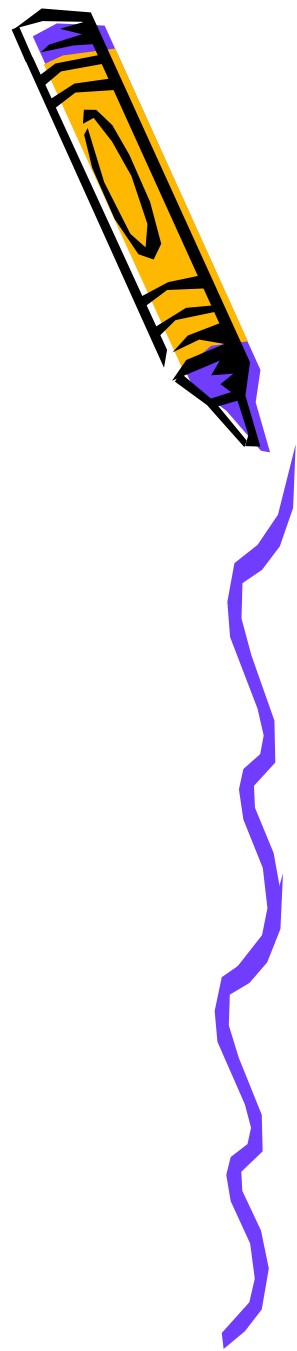
# Right Triangle Trigonometry

Each trig ratio relates the reference angle with two different sides of the triangle.

$$\sin \angle = \frac{\textit{opposite}}{\textit{hypotenuse}}$$

$$\cos \angle = \frac{\textit{adjacent}}{\textit{hypotenuse}}$$

$$\tan \angle = \frac{\textit{opposite}}{\textit{adjacent}}$$



# Right Triangle Trigonometry

Mnemonic to help remember:

## SohCahToa

$$\sin \angle = \frac{\textit{opposite}}{\textit{hypotenuse}}$$

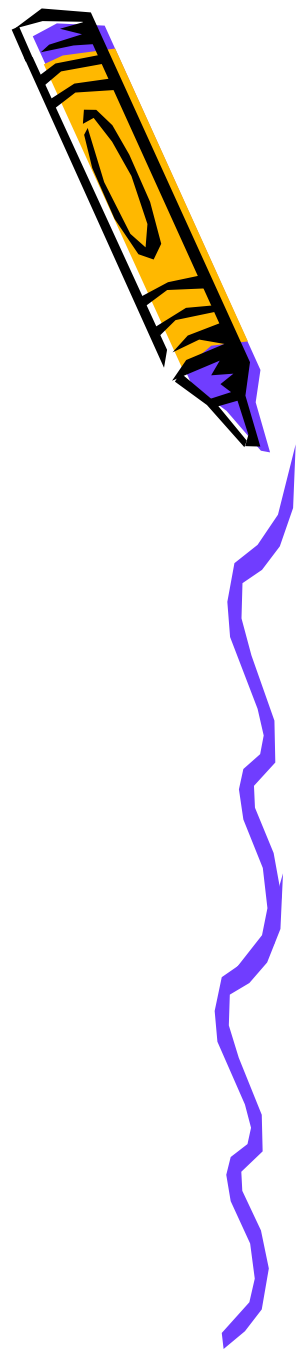
$$S = \frac{o}{h}$$

$$\cos \angle = \frac{\textit{adjacent}}{\textit{hypotenuse}}$$

$$C = \frac{a}{h}$$

$$\tan \angle = \frac{\textit{opposite}}{\textit{adjacent}}$$

$$T = \frac{o}{a}$$



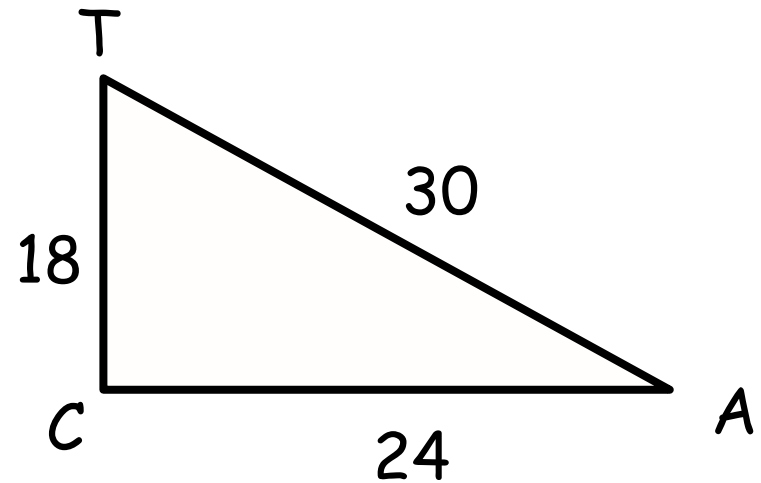
# Right Triangle Trigonometry

Find the indicated trigonometric ratio.

a)  $\sin \angle A =$

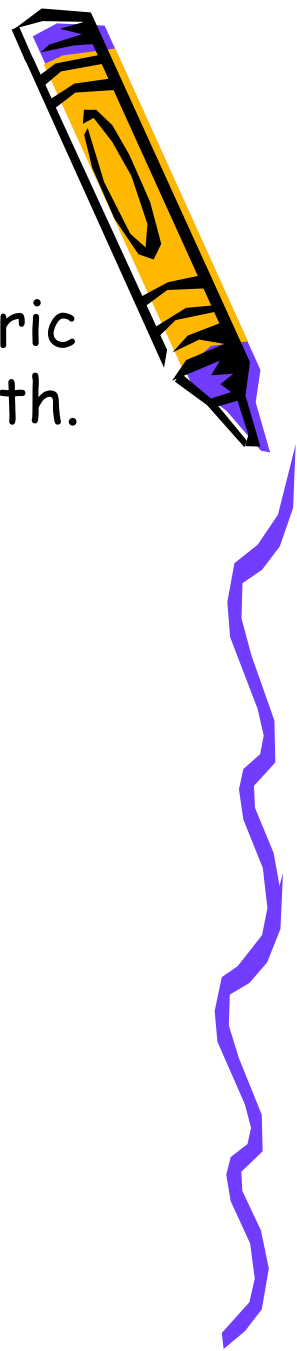
b)  $\cos \angle A =$

c)  $\tan \angle A =$





# Right Triangle Trigonometry



Using a calculator, find the indicated trigonometric ratio's value. Round to the nearest ten-thousandth.

a)  $\sin 30 =$

d)  $\sin 68 =$

b)  $\cos 72 =$

e)  $\cos 18 =$

c)  $\tan 25 =$

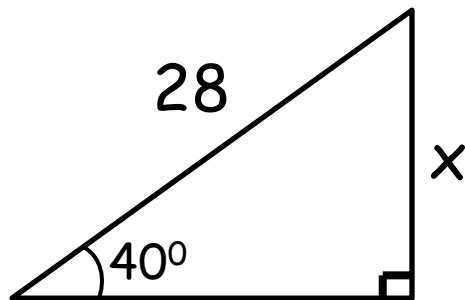
f)  $\tan 74 =$



# Right Triangle Trigonometry



Using a calculator, find the measurement of the indicated side of the triangle. All trig values should be rounded to 4 decimal places (ten-thousandths), and all final measurements for angles and sides should be rounded to the nearest tenth.



Since we're working with the opposite and the hypotenuse, we will use sin.

$$\sin 40 = \frac{x}{28}$$

convert trig name to decimal value

$$.6428 = \frac{x}{28}$$

solve for the variable by cross-multiplying

$$18.0 = x$$

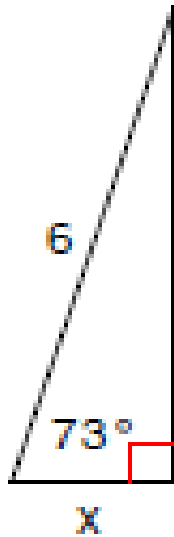


# Right Triangle Trigonometry

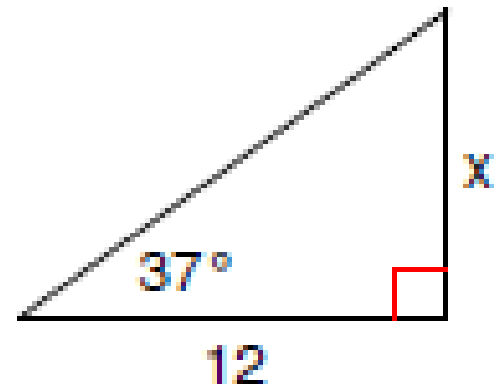
Find the measurement of the indicated segment.



a)



b)



# Right Triangle Trigonometry



Find the measurement of the indicated segment.

