# Curriculum Outcome

A1 Solve problems that require the manipulation and application of formulas related to: perimeter, area, volume, capacity, the Pythagorean theorem, primary trigonometric ratios, income. currency exchange, interest and finance charges.

G2 Demonstrate an understanding of the Pythagorean theorem by: identifying situations that involve right triangles, verifying the formula, applying the formula, solving problems.

G3 Demonstrate an understanding of primary trigonometric ratios (sine, cosine, tangent) by: applying similarity to right triangles, generalizing patterns from similar right triangles, applying the primary trigonometric ratios, and solving problems.
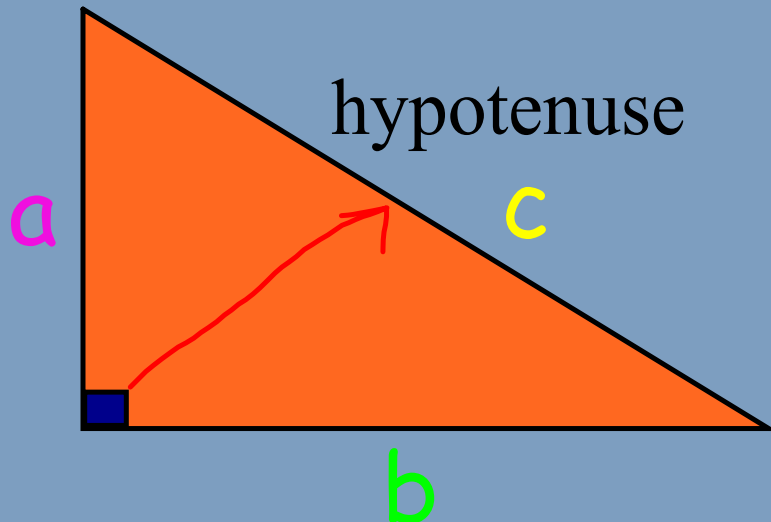
Student Friendly:
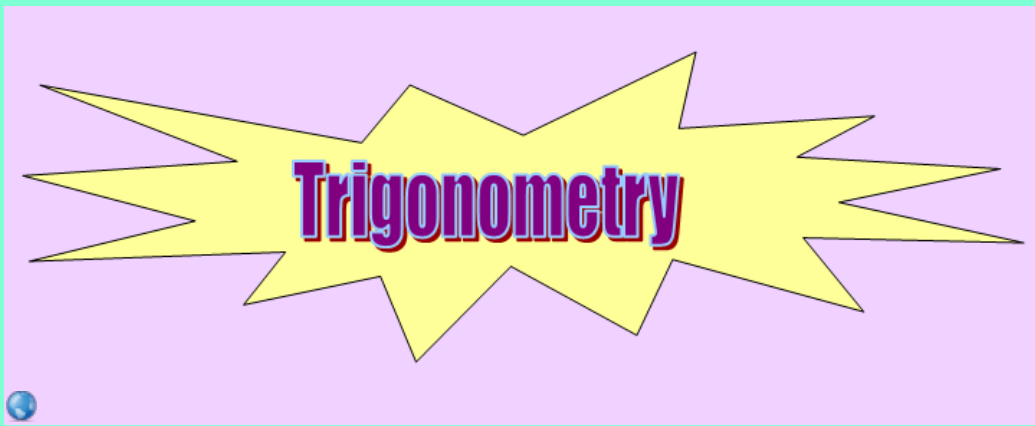
(Play the first 31 sec)

Trigonometry in the Real World

There are many examples of and uses for trigonometry from astronomy to carpentry and even sports
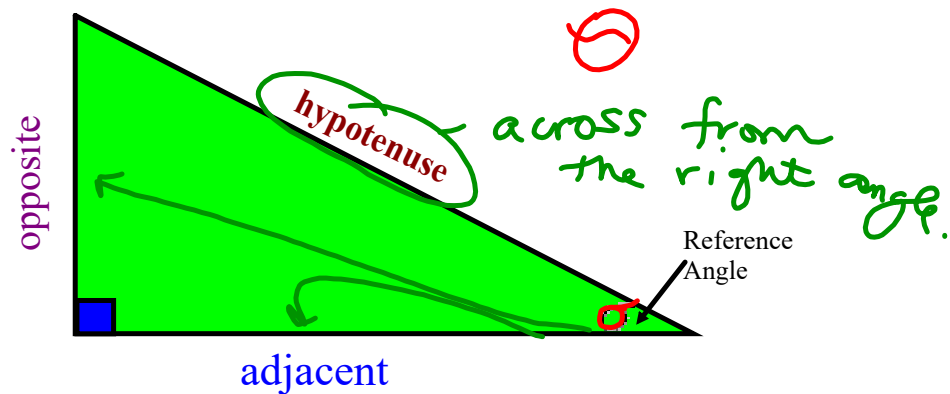
Recall

hypotenuse

a

c

b

Pythagorean Theorem

To find the hypotenuse

$$c^2 = a^2 + b^2$$

To find the leg

$$b^2 = c^2 - a^2$$

The Trigonometric Ratios

opposite

hypotenuse

across from the right angle.
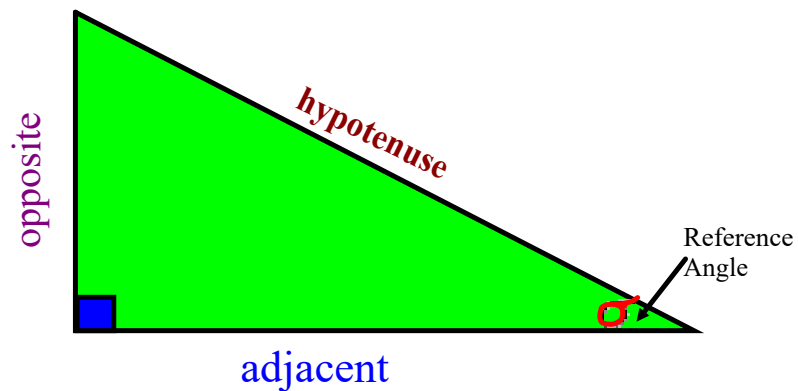
Reference Angle

α

adjacent

Definitions:

Opposite: Having a position on the other or further side of something

Adjacent: Having a position next to or adjoining something

The Trigonometric Ratios

opposite

hypotenuse

Reference
Angle

α

adjacent

Trigonometric Ratios - constant values based on the ratios of sides for particular angles in right-angled triangles

Adjacent: Having a position next to or adjoining something

"Theta" σ

sin σ

σ σ
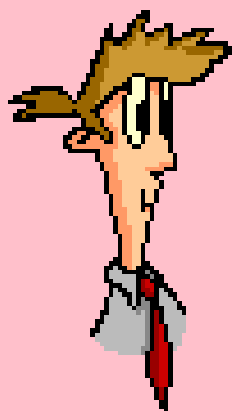
Theta represents the angle.

Primary Ratios of Trigonometry

Sine

$\text{Sin}\,\theta$ = $\dfrac{\text{Opposite Side}}{\text{Hypotenuse}}$ = $\dfrac{o}{h}$

Cosine

$\text{Cos}\,\theta$ = $\dfrac{\text{Adjacent Side}}{\text{Hypotenuse}}$ = $\dfrac{a}{h}$

Tangent

$\text{Tan}\,\theta$ = $\dfrac{\text{Opposite Side}}{\text{Adjacent Side}}$ = $\dfrac{o}{a}$

Remember This Saying !!

"Oscar Had Another Helping Of Apples"

$$\text{Sin } \theta = \frac{O}{h} \quad\quad \underline{\text{Opposite Side}} \\ \text{Hypotenuse}$$

$$\text{Cos } \theta = \frac{a}{h} \quad\quad \underline{\text{Adjacent Side}} \\ \text{Hypotenuse}$$

$$\text{Tan } \theta = \frac{o}{a} \quad\quad \underline{\text{Opposite Side}} \\ \text{Adjacent Side}$$

Remembering the Primary Ratios...

SOH CAH TOA

Some Out-Houses Can Actually Have Totally Odorless Aromas.

OR

T_{wo} C_{ats} S_{at}

O_n A_n O_{range}

A_{nd} H_{eld} H_{ands}

Two Cats Sat On An Orange And Held Hands

Finding The Primary Ratios

1.

Hyp

A ——— 5 ——— B

Opp 4

Adj 3

θ

C
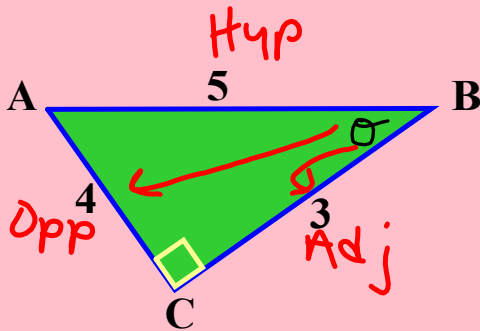
You must always have a right-angled triangle!

$Sin\,\theta = \dfrac{opp}{hyp}$

$Sin\,\theta = \dfrac{4}{5}$

$Sin\,\theta = 0.8$

$\theta = Sin^{-1}(0.8)$

$= 53°$

$Cos\,\theta = \dfrac{adj}{hyp}$

$Cos\,\theta = \dfrac{3}{5}$

$Cos = 0.6$

$\theta = Cos^{-1}(0.6)$

$= 53°$

$Tan\,\theta = \dfrac{opp}{adj}$

$Tan\,\theta = \dfrac{4}{3}$

$Tan = 1.3333$

$\theta = Tan^{-1}(1.3333)$

$\theta = 53°$

Where is theta?

Finding The Primary Ratios

2. adj 15

B

σ

C ◇

hyp 18.1

10

opp

A

$Sin\sigma = \dfrac{opp}{hyp}$ $Cos\sigma = \dfrac{adj}{hyp}$ $Tan\sigma = \dfrac{opp}{adj}$

$= \dfrac{10}{18.1}$ $= \dfrac{15}{18.1}$ $= \dfrac{10}{15}$
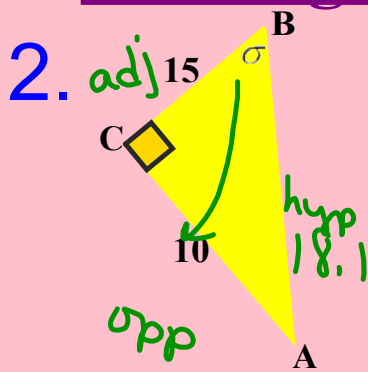
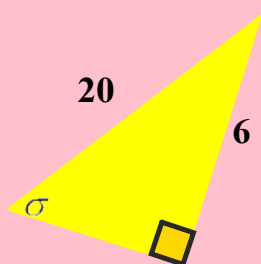**Am I missing something?**

$Sin\sigma = 0.5525$ 0.8287 0.6667

$c^2 = a^2 + b^2$

$c = 18.1$

<u>Finding The Primary Ratios</u>

3.

$$Sin\sigma = \frac{opp}{hyp} \qquad Cos\sigma = \frac{adj}{hyp} \qquad Tan\sigma = \frac{opp}{adj}$$
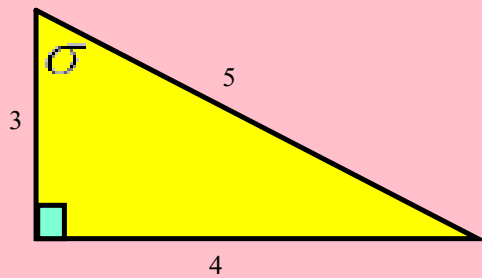
20

6

σ

Find the missing side first...

Use the sides to find the ratios...(then decimal)

use the inverse to find the angle

Example:

State the 3 primary trig ratios for the triangle for the given reference angle
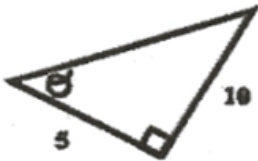
Classwork/Homework

worksheet 1
Trig Ratios : Label hyp, opp, adj
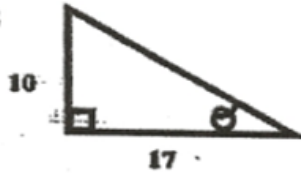
Primary Trig Ratios

For Calculator DEG Mode

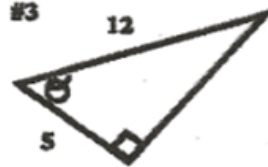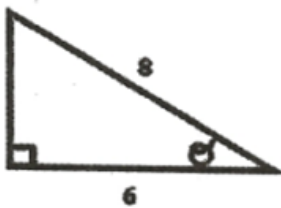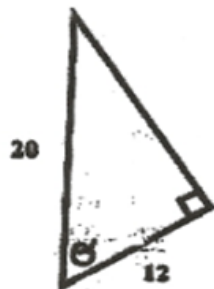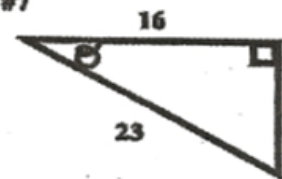** For each of the following list the three primary trig ratios, and theta.

#1

#2

#3   12

#4

#5

#6

#7

Attachments

TrigRatio LAbel wS 1.docx