Warm Up

Find the missing value.

1. $\dfrac{x}{2} = \dfrac{6}{8}$ $x = \dfrac{6(2)}{8}$
    $= 1.5$

3. $\dfrac{6}{7} = \dfrac{2}{x}$ $6x = 2(7)$
    $x = \dfrac{2(7)}{6}$
    $= 2.\overline{3}$

2. $\dfrac{4}{9} = \dfrac{x}{7}$ $\dfrac{4(7)}{9} = x$
    $3.\overline{1} = x$

4. $\dfrac{5}{x} = \dfrac{9}{11}$ $5(11) = 9x$
    $\dfrac{5(11)}{9} = x$
    $6.\overline{1} = x$

Right angled triangles ratios

theta

short form

sine θ = $\dfrac{\text{opposite}}{\text{hypotenuse}}$

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

cosine θ = $\dfrac{\text{adjacent}}{\text{hypotenuse}}$

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

tangent θ = $\dfrac{\text{opposite}}{\text{adjacent}}$

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

acronym......   SOH CAH TOA

<p align="center" style="color:red">Trigonometric Ratios</p>

- Each angle has a specific trigonometric ratio

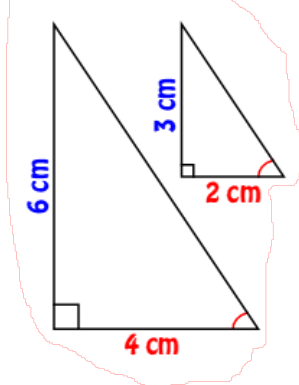 ie. tan 56° = 1.4826 (ALWAYS carry 4 decimal places!!)

  cos 50° = 0.6428

  34

  a   56

  $\tan 56° = \dfrac{a}{b}$
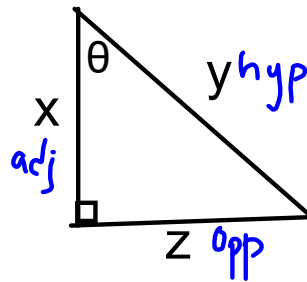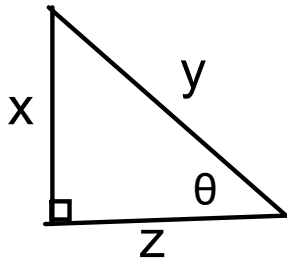
  b

  2π

  These ratios will be found
  using a scientific calculator

Look at these two triangles...they are similar.

3 cm

6 cm

2 cm

4 cm

Even though these triangles are
different sizes, the ratios of their
sides would be equal.

This confirms that as long as the
angles are the same measure, the
trigonometric ratios will be the same.

x   y

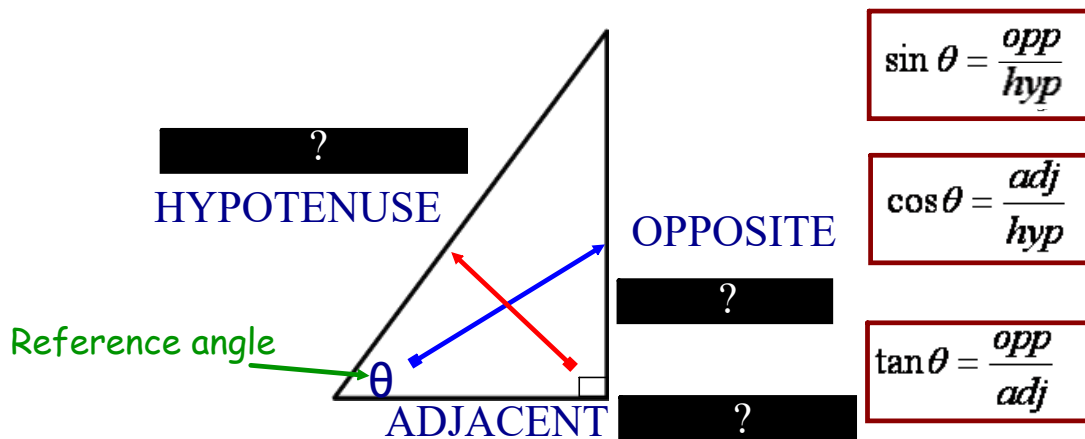θ

z

$\tan \theta = \dfrac{opp}{adj}$

$= \dfrac{x}{2}$

$\cos \theta = \dfrac{adj}{hyp}$

$= \dfrac{2}{y}$

θ   y ^{hyp}

x ^{adj}

z ^{opp}

$\tan \theta = \dfrac{opp}{adj}$

$= \dfrac{z}{x}$

$\cos \theta = \dfrac{adj}{hyp}$

$= \dfrac{x}{y}$

Trigonometric Ratios

*** Must have calculator in DEGREE mode ***

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

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

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

HYPOTENUSE

OPPOSITE

Reference angle

ADJACENT

θ

"These are called the *Primary Trig Ratios*"

REMEMBER: "SOH CAH TOA"

Examples

1. cos 74^0 = 0.2756

2. sin θ = 0.5 $\theta = \sin^{-1} 0.5$

    $= 30°$

3. Find θ.
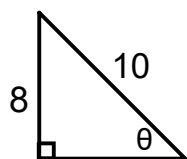
    $\sin \theta = \frac{opp}{hyp}$

    $= \frac{8}{10}$

    $\sin \theta = 0.8$

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

    $= 53°$

Examples

1. $\cos 74° = 0.2756$

2. $\sin \theta = 0.5$ $\cdots$ $\dfrac{\sin \theta}{\sin} = \dfrac{0.5}{\sin}$

   $\theta = \sin^{-1} 0.5$

   $= 30°$

3.

   $\sin \theta = \dfrac{opp}{hyp}$

   $= \dfrac{8}{10}$

   $\theta = \sin^{-1} 0.8$

   $= 53°$