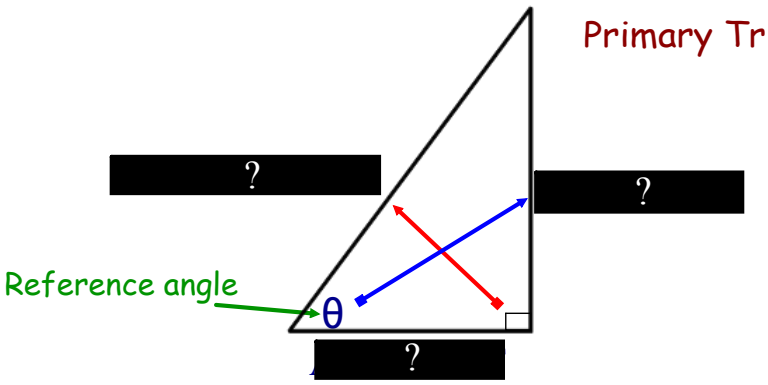
Trigonometric Ratios

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



Primary Trigonometric Ratios

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

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

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

Memory Aid: "SOH CAH TOA"

Reciprocal Trigonometric Ratios

$$\text{cosecant}\,\theta = \frac{hypotenuse}{opposite}$$

$$\text{secant}\,\theta = \frac{hypotenuse}{adjacent}$$

$$\text{cotangent}\,\theta = \frac{adjacent}{opposite}$$

Notice that these ratios are each the reciprocal of one of the primary trig ratios

Summary

Primary Ratios	Reciprocal Ratios
$\sin\theta = \frac{opp}{hyp}$	$\csc\theta = \frac{hyp}{opp}$
$\cos\theta = \frac{adj}{hyp}$	$\sec\theta = \frac{hyp}{adj}$
$\tan\theta = \frac{opp}{adj}$	$\cot\theta = \frac{adj}{opp}$

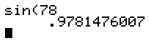
Reciprocal ratios are not found on a calculator....we must learn how to use the reciprocal function on our calculator.

Reciprocal Functions ---------> x^{-1} or $1/x$

Inverse Trigonometric Functions
(Arc Trig Functions)

Trigonometric Functions

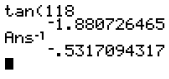
Evaluate each of the following:



$\sin 78° =$ 0.9781

$\cos\theta = 0.6469$

$\theta =$ 50°



$\cot 118° =$

$\sec\theta = 3.2361$

$\theta =$ 72°

cot 48° = 0.9004

sec 130° = −1.5557

csc 76° = 1.0306

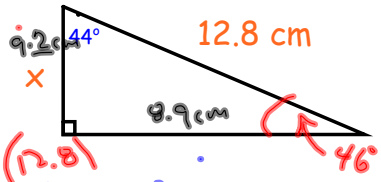
sec θ = −1.4382
θ = 134°

csc θ = 1.7847
θ = 34°

cos θ = 0.8722
θ = 78°

cot θ = −0.5382
θ = −62°

EXAMPLE - Finding an unknown side



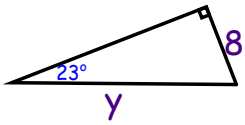
$\cos 44° = \frac{x}{12.8}$ (12.8)

$x = 12.8 \cos 44°$

$x = 9.2\text{cm}$

$\sin 44° = \frac{y}{12.8}$

$y = 12.8 \sin 44° = 8.9\text{cm}$



$(y)\sin 23° = \frac{8}{y}(y)$

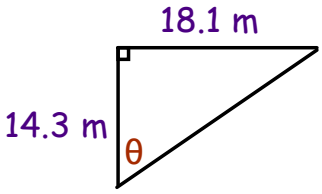
$y = \frac{8}{\sin 23°}$

$y = 20.5$

$\csc 23° = \frac{y}{8}$

$y = 8 \csc 23°$

EXAMPLE - Finding an unknown angle

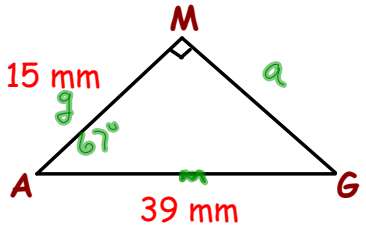


$\tan\theta = \frac{18.1}{14.3}$

$\theta = \tan^{-1}\left(\frac{18.1}{14.3}\right)$

$\theta = 52°$

EXAMPLE - Solve the triangle (find ALL sides and angles)



$\cos A = \frac{15}{39}$

$A = \cos^{-1}\left(\frac{15}{39}\right)$

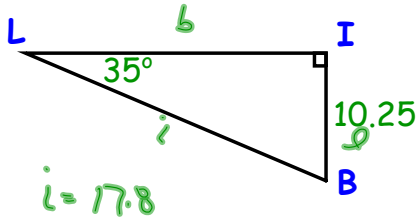
$A = 67°$

$\therefore G = 23°$

$a^2 = 39^2 - 15^2$

$a^2 = 1296$

$a = 36\text{mm}$



$i = 17.8$

$b = 14.6$

$B = 55°$

HOMEWORK...

Worksheet - Primary Trig Ratios.doc

Attachments

Worksheet - Primary Trig Ratios.doc