Notes Section 11.1A Name: _____

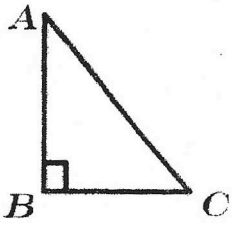
11.1A Trig Functions in Right Triangles

I can evaluate the six trig functions given a right triangle.
Given one trig ratio, I can use the Pythagorean theorem to find the five remaining trig ratios.
I can use trig functions to find missing sides of a right triangle.
I can use inverse trig functions to find missing angles of a right triangle.

Trigonometry is the Greek term meaning _____ _____.

When working with angles we tend to use a variable other than "x". Instead we use _____.

Recognizing the parts
Hypotenuse –
Opposite side -
Adjacent side –

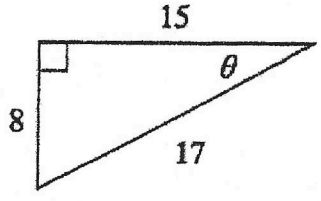


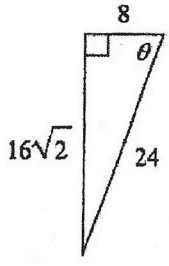
$Sin\,\theta =$ $Csc\,\theta =$

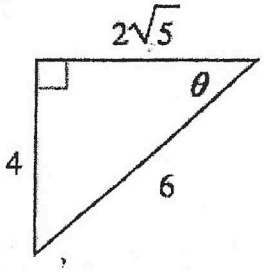
$Cos\,\theta =$ $Sec\,\theta =$

$Tan\,\theta =$ $Cot\,\theta =$

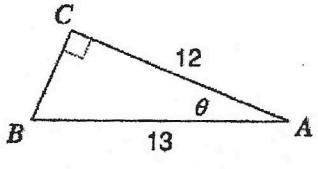
I can evaluate the six trig functions given a right triangle.

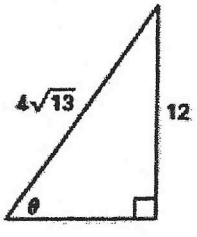


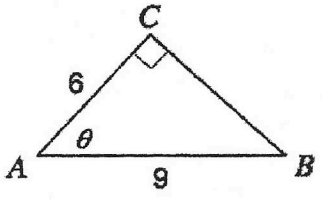




Given one trig ratio, I can use the Pythagorean theorem to find the five remaining trig ratios.







I can use trig functions to find missing sides of a right triangle. (Use $\sin\theta, \cos\theta, \tan\theta$)

Steps for solving for a missing side of a triangle using trigonometry:

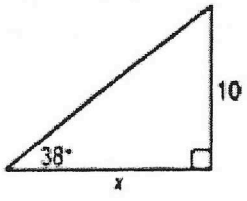
1-

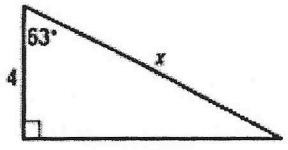
2-

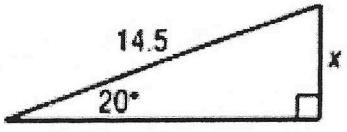
3-

4-

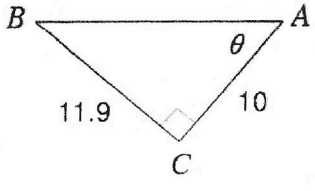
5-

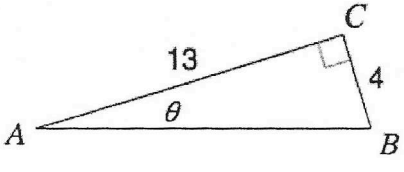


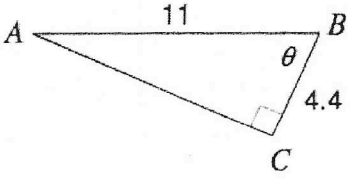




I can use inverse trig functions to find missing angles of a right triangle.
(Use $\sin^{-1}\theta, \cos^{-1}\theta, \tan^{-1}\theta$)







Notes Section 11.1A

Name: Key

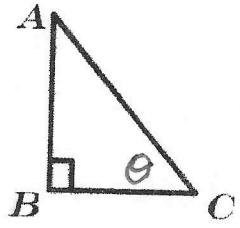
11.1A Trig Functions in Right Triangles

I can evaluate the six trig functions given a right triangle.
Given one trig ratio, I can use the Pythagorean theorem to find the five remaining trig ratios.
I can use trig functions to find missing sides of a right triangle.
I can use inverse trig functions to find missing angles of a right triangle.

Trigonometry is the Greek term meaning many angles.

When working with angles we tend to use a variable other than "x". Instead we use θ "theta"

Recognizing the parts
Hypotenuse – opposite right angle (always) - longest side.
Opposite side - opposite the chosen angle.
Adjacent side – adjacent to the chosen angle (not hyptonuse)



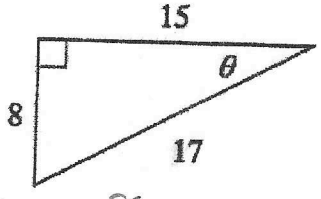
Soh Cah Toa

$\sin\theta = \frac{AB}{AC}$ $\quad \csc\theta = \frac{AC}{AB}$

$\cos\theta = \frac{BC}{AC}$ $\quad \sec\theta = \frac{AC}{BC}$

$\tan\theta = \frac{AB}{BC}$ $\quad \cot\theta = \frac{BC}{AB}$

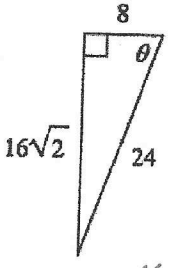
I can evaluate the six trig functions given a right triangle.



$\sin\theta = \frac{8}{17}$ $\quad \csc\theta = \frac{17}{8}$

$\cos\theta = \frac{15}{17}$ $\quad \sec\theta = \frac{17}{15}$

$\tan\theta = \frac{8}{15}$ $\quad \cot\theta = \frac{15}{8}$

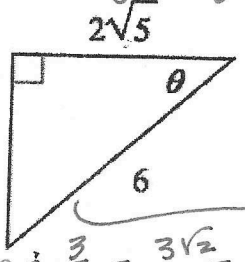


$\sin\theta = \frac{16\sqrt{2}}{24} = \frac{2\sqrt{2}}{3}$

$\cos\theta = \frac{8}{24} = \frac{1}{3}$

$\tan\theta = \frac{16\sqrt{2}}{8} = 2\sqrt{2}$

You try:



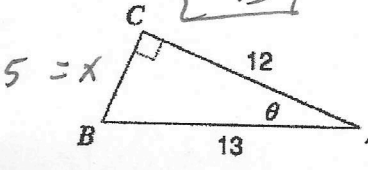
$\csc\theta = \frac{3}{2\sqrt{2}} = \frac{3\sqrt{2}}{4}$

$\sec\theta = 3$

$\tan\theta = \frac{1}{2\sqrt{2}} = \frac{\sqrt{2}}{4}$

Given one trig ratio, I can use the Pythagorean theorem to find the five remaining trig ratios.

$\cos\theta = \frac{12}{13}$



$13^2 = 12^2 + x^2$

$169 = 144 + x^2$

$25 = x^2$

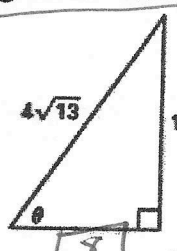
$5 = x$

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

$\sin\theta = \frac{5}{13}$ $\quad \tan\theta = \frac{5}{12}$

$\csc\theta = \frac{13}{5}$ $\quad \sec\theta = \frac{13}{12}$ $\quad \cot\theta = \frac{12}{5}$

Given:



$\sin\theta = \frac{12}{4\sqrt{13}} = \frac{3}{\sqrt{13}} = \frac{3\sqrt{13}}{13}$

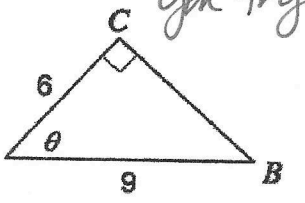
$x^2 + 12^2 = (4\sqrt{13})^2$

$x^2 = 8$

$\csc\theta = \frac{4\sqrt{13}}{12} = \frac{\sqrt{13}}{3}$; $\sec\theta = \frac{4\sqrt{13}}{8} = \frac{\sqrt{13}}{2}$

$\cos\theta = \frac{8}{4\sqrt{13}} = \frac{2}{\sqrt{13}} = \frac{2\sqrt{13}}{13}$; $\tan\theta = \frac{12}{8} = \frac{3}{2}$; $\cot\theta = \frac{2}{3}$

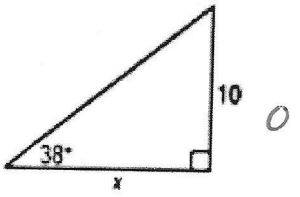
You try:



I can use trig functions to find missing sides of a right triangle. (Use $\sin\theta, \cos\theta, \tan\theta$)

Steps for solving for a missing side of a triangle using trigonometry:

1- Identify the given angle.
2- Label the sides (hypotenuse, adjacent, opposite)
3- Determine the trig function (sin, cos, or tan)
4- Write an equation
5- Solve ☺



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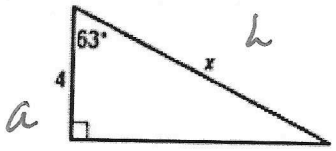
$\frac{\tan 38}{1} = \frac{10}{x}$

$x \cdot \tan 38 = 10$

$x = \frac{10}{\tan 38}$

$x \approx 12.8$



h
a

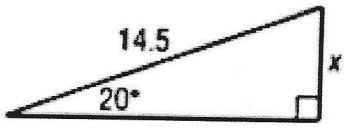
$\frac{\cos 63}{1} = \frac{4}{x}$

$x \cdot \cos 63 = 4$

$x = \frac{4}{\cos 63}$

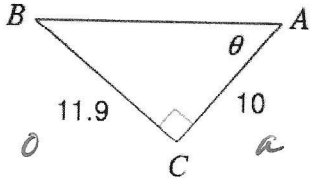
$x \approx 8.8$

you try ☺



I can use inverse trig functions to find missing angles of a right triangle. (Use $\sin^{-1}\theta, \cos^{-1}\theta, \tan^{-1}\theta$)

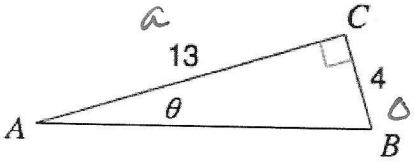
you try!



$\tan\theta = \frac{11.9}{10}$

$\theta = \tan^{-1}\left(\frac{11.9}{10}\right)$

$\theta \approx 50°$



$\tan\theta = \frac{4}{13}$

$\theta = \tan^{-1}\left(\frac{4}{13}\right)$

$\theta = 17°$