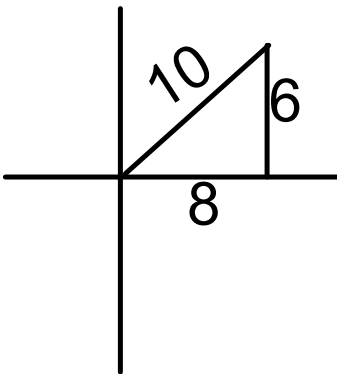


Day 18 - Question #4;**Finding values of trigonometric functions given information about an angle: Problem type 1**

Let $(8, 6)$ be a point on the terminal side of θ .

Find the exact values of $\cos \theta$, $\sec \theta$, and $\cot \theta$.



$$\cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{8}{10}$$

$$\sec \theta = \frac{1}{\cos \theta} = \frac{10}{8}$$

$$\cot \theta = \frac{\text{adj}}{\text{opp}} = \frac{8}{6}$$

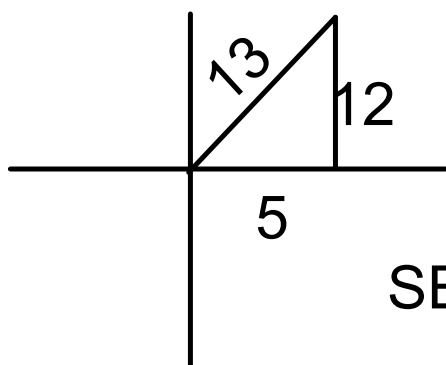
Clear Undo Help

Day 18 - Question #5;

Finding values of trigonometric functions given information about an angle: Problem type 2

Let θ be an angle in quadrant I such that $\sin \theta = \frac{12}{13}$.

Find the exact values of $\sec \theta$ and $\cot \theta$.



$$\text{sqr}(13*13-12*12)=5$$

PYTAGOREAN

$$\text{SEC} = 13/5$$

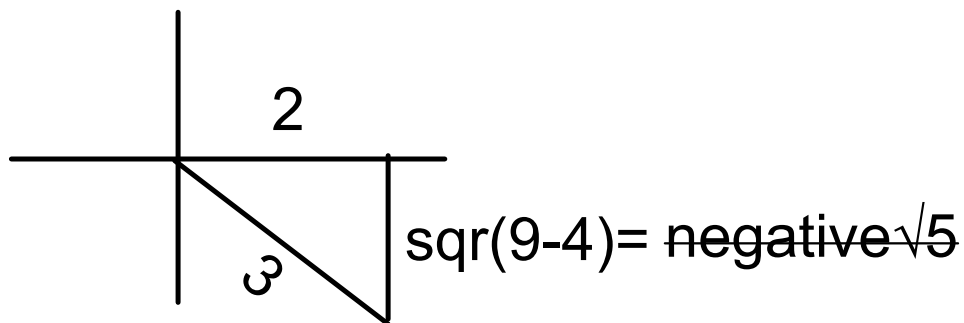
$$\text{COT} = 5/12$$

Day 18 - Question #6;

Finding values of trigonometric functions given information about an angle: Problem type 3

Let θ be an angle in quadrant IV such that $\sec \theta = \frac{3}{2}$.

Find the exact values of $\cot \theta$ and $\sin \theta$.



$$\text{SIN} = -\frac{\sqrt{5}}{3}$$

Day 18 - Question #7;
Values of inverse trigonometric functions

Find the exact value of $\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$. $\sin(-\pi/3) = -\sqrt{3}/2$

Write your answer in radians in terms of π .

in calculator...

$\arcsin(-\sqrt{3}/2) = -60$ degree

$-60 * \pi / 180 = -\pi / 3$

$x = \sin^{-1}(a)$ means $\sin(x) = a$

Day 18 - Question #8;
Values of inverse trigonometric functions

Find the exact value of $\tan^{-1}(-\sqrt{3})$.

Write your answer in radians in terms of π .

$$x = \tan^{-1}(-\sqrt{3})$$

$$\tan(x) = -\sqrt{3}$$

Day 18 - Question #9;**Finding solutions in an interval for a basic equation involving sine or cosine**

Find all solutions of the equation in the interval $[0, 2\pi)$.

$$\cos \theta + 1 = 0$$

Write your answer in radians in terms of π .

If there is more than one solution, separate them with commas.

BY HAND...

$$\cos(X) = -1$$

$$X = \cos^{-1}(-1)$$

=pi radians

with calculator

$$x_{\min}:0$$

$$x_{\max}:2\pi$$

$$y_1=\cos x+1$$

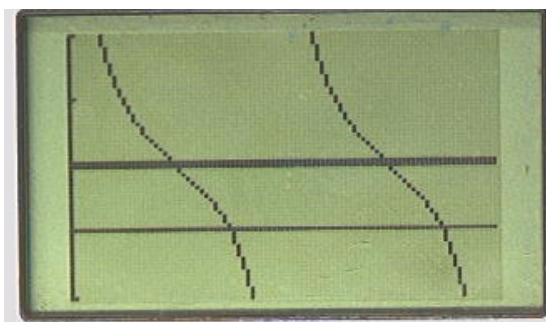
$$y_2=0$$

zoom 0:fit

calc 5:intersect

Enter x3

$$3.14159...=\pi$$



answer: 135. 315 degree

Day 18 - Question #10;

Finding solutions in an interval for a basic tangent, cotangent, secant, or cosecant equation

Find all solutions of the equation in the interval $[0, 2\pi)$.

$$\cot \theta + 1 = 0$$

Write your answer in radians in terms of π .

If there is more than one solution, separate them with commas.

Trig Identities

1. Reciprocal Identities

$$\sec(x) = 1 / \cos(x)$$

$$\csc(x) = 1 / \sin(x)$$

$$\tan(x) = 1 / \cot(x)$$

2. Quotient Identities

$$\tan(x) = \sin(x) / \cos(x)$$

Simplifying trigonometric expressions

Simplify.

$$\frac{\csc x}{\sec x \cot x} = \frac{1/\sin(x)}{1/\cos(x) \cot(x)} \quad \begin{array}{l} \text{because of} \\ \text{recip ID} \end{array}$$

Use algebra and the fundamental trigonometric identities.
Your answer should be a number or use a single trigonometric function.

$$= \frac{1/\sin(x)}{1/\cancel{\cos(x)} \cancel{\cos(x)}/\sin(x)} \quad \begin{array}{l} \text{quot} \\ \text{ID} \end{array}$$

$$= 1 \quad \text{by algebra}$$

Reciprocal identities:

$$\sin u = \frac{1}{\csc u} \quad \cos u = \frac{1}{\sec u} \quad \tan u = \frac{1}{\cot u}$$

$$\csc u = \frac{1}{\sin u} \quad \sec u = \frac{1}{\cos u} \quad \cot u = \frac{1}{\tan u}$$

Quotient identities:

$$\tan u = \frac{\sin u}{\cos u} \quad \cot u = \frac{\cos u}{\sin u}$$

Pythagorean identities:

$$\sin^2 u + \cos^2 u = 1$$

$$\tan^2 u + 1 = \sec^2 u$$

$$\cot^2 u + 1 = \csc^2 u$$

Odd/Even function identities:

$$\sin(-u) = -\sin(u) \quad \cos(-u) = \cos(u) \quad \tan(-u) = -\tan(u)$$

$$\csc(-u) = -\csc(u) \quad \sec(-u) = \sec(u) \quad \cot(-u) = -\cot(u)$$

Text for students to read.

STEP 2: Content

Please select the content for

Randomly add 5 questions

Default View All Assignments

This view shows assignments in this course. Open the assignments to see the topics used. You may remove these assignments. To return you want to the window on the

All Assignments [open all]

- Homeworks
- Quizzes
- Tests

4:34 PM
11/5/2014

Reciprocal identities:

$$\begin{aligned} \checkmark \sin u &= \frac{1}{\csc u} & \checkmark \cos u &= \frac{1}{\sec u} & \checkmark \tan u &= \frac{1}{\cot u} \\ \checkmark \csc u &= \frac{1}{\sin u} & \checkmark \sec u &= \frac{1}{\cos u} & \checkmark \cot u &= \frac{1}{\tan u} \end{aligned}$$

Quotient identities:

$$\checkmark \tan u = \frac{\sin u}{\cos u} \quad \cot u = \frac{\cos u}{\sin u}$$

Pythagorean identities:

$$\begin{aligned} \checkmark \sin^2 u + \cos^2 u &= 1 \\ \tan^2 u + 1 &= \sec^2 u \\ \cot^2 u + 1 &= \csc^2 u \end{aligned}$$

Odd/Even function identities:

$$\begin{aligned} \sin(-u) &= -\sin(u) & \cos(-u) &= \cos(u) & \tan(-u) &= -\tan(u) \\ \csc(-u) &= -\csc(u) & \sec(-u) &= \sec(u) & \cot(-u) &= -\cot(u) \end{aligned}$$

even functions like $f(x)=x^2$

$$f(-x) = (-x)^2 = x^2$$

odd functions like $f(x)=x^3$

$$f(-x) = (-x)^3 = -x^3$$

Simplify.

$\cos x \csc x$

$$= \cos * 1/\sin = \cos / \sin = \cot$$

Statement	Rule
$(1 - \sin^2 x) \tan x$	
$= \cos^2 x \tan x$	<u>Rule ?</u>
$= \cos^2 x \left(\frac{\sin x}{\cos x} \right)$	<u>Rule ?</u>
$= \cos x \sin x$	<u>Rule ?</u>

pythagorean
quotient
algebra

Statement	Rule
$(1 - \sin^2 x) \tan x$	
$= \cos^2 x \tan x$	<u>Pythagorean</u>
$= \cos^2 x \left(\frac{\sin x}{\cos x} \right)$	<u>Quotient</u>
$= \cos x \sin x$	<u>Algebra</u>

The screenshot shows the ALEKS PreCalculus interface. At the top, there is a navigation bar with options like MyPie, Review, Dictionary, Calculator, Assignments, Book, Gradebook, and Calendar. The main content area displays "Question #4 / 6" and asks the user to "Prove the identity." The identity to be proven is $\sin x (1 + \cot^2 x) = \csc x$. Below the identity, a note states: "Note that each Statement must be based on a Rule chosen from the Rule menu. To see a detailed description of a Rule, select the corresponding question mark." A "Quick Help" box is visible, asking "How do I enter a proof?". The proof area consists of a table with two columns: "Statement" and "Rule". The first row of the table contains the expression $\sin x (1 + \cot^2 x)$ in the Statement column and is empty in the Rule column. The second row contains an equals sign followed by a cursor in the Statement column and "Rule ?" in the Rule column. Below the table, there is a link: "Click here to validate this line; Click on Next Question>> below to submit your answer." To the right of the table is a "Rule menu" containing various mathematical symbols and functions: \square , \square , π , $\square \cos \square$, $\square \sin \square$, $\square \tan \square$, $\square \cot \square$, $\square \sec \square$, $\square \csc \square$, and (\square) . The Windows taskbar at the bottom shows the time as 4:53 PM on 11/5/2014.


Statement	Rule
$\sin x (1 + \cot^2 x)$	
$= \sin x (\csc^2 x)$	Pythagorean
$= \sin x \csc x \csc x$	Algebra
$= \sin x \cdot \frac{1}{\sin x} \csc x$	Reciprocal
$= \csc x$	Algebra
$= \boxed{\csc x}$	<i>Rule ?</i>

$\csc x - \cot x \cos x$	
$= \frac{1}{\sin x} - \cot x \cos x$	Reciprocal
$= \frac{1}{\sin x} - \frac{\cos x}{\sin x} \cos x$	Quotient
$= \frac{1 - \cos^2 x}{\sin x}$	Algebra
$= \frac{\sin^2 x}{\sin x}$	Pythagorean

$\frac{1}{\cos x} - \frac{\cos x}{1 + \sin x}$	
$= \frac{1 + \sin x}{\cos x (1 + \sin x)} - \frac{\cos x \cos x}{(1 + \sin x) \cos x}$	Algebra
$= \frac{1 + \sin x - \cos^2 x}{\cos x (1 + \sin x)}$	Algebra
$= \frac{\sin^2 x + \sin x}{\cos x (1 + \sin x)}$	Pythagorean
$= \frac{\sin x (1 + \sin x)}{\cos x (1 + \sin x)}$	Algebra
$= \frac{\sin x}{\cos x}$	Algebra
$= \tan x$	Quotient

Go to the Catalog

```
DiagnosticOff
DiagnosticOn
```



```
DiagnosticOn
Done
```

```
LinReg
y=ax+b
a=12.7654191
b=17.49022124
r2=.96906549
r=.9844112403
```

new!!!

$$0 \leq r^2 \leq 1$$

means: how close data is
to graph

1=100% great!

.9=90% awesome

.7=70% passing

