IB Math Pre HL Intro to Trig Identities Read these notes carefully!

**Identity**: An equation that is always true. Ex:  is true for every value of *x*, so it is an **identity**.

We are going to learn LOTS of identities in the next several days. An identities formula sheet will be provided on quizzes and tests.

Here is a proof of my favorite identity.

a. Draw  with right angle *C*.

b. Write the Pythagorean Theorem using *a*, *b*, and *c*.

Now consider a point on the Unit Circle.

c. Label the legs of the right triangle.

d. Use the triangle to explain why .

**The Pythagorean Identity**: 

Let’s try problem #1 from tonight’s homework.

1. Rewrite and simplify  using  and .

Step 1: Write  and  in terms of sine and cosine:  

Step 2: Notice that secant and tangent have the same denominator!

Step 3: Take  and divide every term by . (Why not just ?)

  (Why is this legal?)

Step 4: Simplify the result.

 (How did I get that?)

We just found another Pythagorean Identity: .

Do Problem #2 to get the third Pythagorean Identity.

Here are the identities you need tonight:

|  |  |  |
| --- | --- | --- |
| **Definitions** (you should already know these) |  |  |
|  |  |  |  |  |
| **Pythagorean Identities** |  |  |  |
|  |  |  |  |  |
| **Negative Angle Identities** |  | For Negative Angle Identities, think about whether sine, cosine, and tangent are odd or even functions. |
|  |  |  |

Here are a couple more problems from tonight’s homework. For each problem, I am only using the above identities and algebra to rearrange an expression until it looks like what I’m looking for.

6. Simplify  to an expression.



13. Prove the identity: . (This means rewrite ONE side of the equation to match the other side.)

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|  |  | Notes: 1. My comments in parentheses are to aid your understanding. You are not required to comment like that.
2. I rewrote only ONE side of the equation until it matched the other side.
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**Class Work: (Let’s do together)**

Prove the identity.

1.  2.  3.  4. 

5.  6.  7.  8. 

9.  10. 