**6.1 – RECIPROCAL, QUOTIENT AND PYTHAGOREAN IDENTITIES**

**I – Identities vs. Equations**

An **identity** is an equality that is true for all values of the variable(s) on their domain. Ex:

An **Equation** is an equality that is true only for some values of the variable on the domain. Ex:

If you want to prove that an equality is true for a certain value of the variable, you need to evaluate each side of the equality **SEPARATELY** and compare them.

Example: Prove that for

Your turn: Prove that for

BE CAREFUL, proving that an equality is true for some (or even many) values doesn’t prove that it’s an identity!

The previous example would have been false for for example. To prove an identity, we will have to transform expressions using other identities that have been proven or definitions.

**II – Non-permissible values of a trigonometric expression:**

Most of the times, you will just need to make sure that denominators (visible of hidden)don’t equal zero.

The hidden denominators exist when the expression includes .

Example 1: Determine the restrictions of .

Reminder on fractions: exists when   
 when (and otherwise it wouldn’t even exist…)

Example 2: Determine the restrictions of .

Your turn:

A close-up of a couple of yellow objects

Description automatically generated

**III – Using Identities to simplify expressions:**

In this section, we will use the first 8 identities on the formula sheet.

Most of the time, we rewrite everything in terms of and .

Example 1: Simplify

Example 2: Simplify

NOTE: The Pythagorean identity is used in 3 different ways:

Example 3: Simplify

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