cmath q1

# Revision history

V 1.0: initial release

# usage history

# problem description

We know from trigonometry that the equation below should always be true:  
  
However, the computer can only approximate the values of sin and cos. Write a program that prompts the user to enter a value for x and evaluate the above expression. Test it with as many test cases as you can, and output the result each time. Does it always equal to zero? (Note: nowadays, computers are getting better and better at this approximation, so it may be difficult to find a test case for which the equation doesn’t hold. That’s not a bad thing!)

# Solution

#include <iostream>

#include <cmath>

**using** **namespace** std**;**

int main**()**

**{**

double x**;**

cout **<<** "Enter a value for x in radians: " **<<** endl**;**

cin **>>** x**;**

double result **=** pow**(**sin**(**x**),**2**)** **+** pow**(**cos**(**x**),**2**)** **-** 1**;**

cout **<<** result**;**

**}**

Note: I chose to use both the pow function and the sin/cos functions to increase the number of cmath library functions I used.

# suggested test cases

None. The behaviour of the cmath library depends on the students computer. Students are encouraged to test it widely with large, small, and negative values, and see if any unexpected results happen.

# required topics

* Floating point rounding
* Design of good test cases
* Use of pow, sin, cos functions