Changing Variables q2

# Revision history

V 1.0: initial release

# usage history

# problem description

Declare a constant double that converts radians to degrees, and another that converts degrees to radians. Have the user enter a value in radians. Convert the value to degrees and store the result. Output the result, then convert it back to radians and output the result. Does the last output always agree with the input? Test it until you are satisfied with your answer.

# Solution

#include <iostream>

#include <cmath>

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

int main**()**

**{**

const double RAD\_TO\_DEG **=** 180**/**M\_PI**;**

const double DEG\_TO\_RAD **=** M\_PI**/**180**;**

double rads**;**

cout **<<** "Enter a value in radians"**;**

cin **>>** rads**;**

double degs **=** rads**\***RAD\_TO\_DEG**;**

double backToRads **=** degs**\***DEG\_TO\_RAD**;**

cout **<<** degs **<<** " " **<<** backToRads **<<** endl**;**

**}**

# suggested test cases

Students will have difficulty discerning a difference when using input values between -2 pi and 2 pi.

The number 192.5786, or any number large enough to include rounding in its decimal places, will very likely display as a rounded number when outputting backToRads. Students who know how to use the iomanip library should confirm that the actual value itself is rounded inexactly.

# required topics

* Use of constants in a math expression
* Potential for floating point rounding errors
* Design of good test cases