Problem 1:
Write a program that verifies the trig identity

$$\sin\alpha\cos\beta = \frac{1}{2}\left(\sin(\alpha+\beta)+\sin(\alpha-\beta)\right)$$

Input two angles A and B in degrees from user and convert the angles to radians α and β respectively ($360^\circ = 2\pi$). Then compute and output $\sin\alpha\cos\beta$ and $\frac{1}{2}\left(\sin(\alpha+\beta)+\sin(\alpha-\beta)\right)$. The input and output should be exactly:

```
What is the degree of angle A?
[USER ENTERS A DECIMAL NUMBER]
What is the degree of angle B?
[USER ENTERS A DECIMAL NUMBER]
The left-hand-side of the trig identity evaluates to [sin α cos β].
The right-hand-side of the trig identity evaluates to
[1/2 (sin(α + β) + sin(α − β))].
```

Hint: You may want to define PI($\pi = 3.1415926535897932...$) as a constant double for your conversion.

Problem 2:
Write a program to input an positive integer from user and calculate the product of its digits. For example, if user inputs 375, your output should be 105, which evaluated from $3 \times 7 \times 5$. Your code should work for all integers ranging from 100 to 999. The input and output should be exactly:

```
Input an integer between 100 and 999:
[USER ENTERS AN INTEGER FROM 100 TO 999]
The product of digits is [YOU DO THE MATH].
```

Hint: For this homework, you can assume the user always input an number in the required the range, so you don't have to check if the input is valid.

Instructions for submission:

- Name your files exactly `hw2_P1.cpp` and `hw2_P2.cpp` respectively.
- You may not use `#include "stdafx.h"`.
- Add code description in the comment at the beginning of the file. A sample description may look like:

```
/*  PIC 10A 2A, Homework 1
    Purpose: miles to kilometers and feet converter
    Author: Hanqin Cai
    Date: 10/10/2018
*/
```

- Submit only `hw2_P1.cpp` and `hw2_P2.cpp` on CCLE.