University of Mauritius
Faculty of Engineering
Department of Computer Science & Eng.

CSE 1017Y – Computer Programming
2015/2016- Semester 1

Labsheet 2-

In this labsheet, you will practise using the cmath library

Note: The angles passed to the trigonometric functions from the cmath library are in radians. Thus, if you input your angles in degrees and you want to use sin or cos or tan, you have to convert the angle to radians.

To use π, there is a name M_PI that has already been defined in the cmath library. You can make use of it. Eg. To calculate $πr^2$, use M_PI *r*r.

Question 1
Type in the program on quadratic equations and run it.

Question 2
Make a copy of the program for question 1 and modify it so that it works for complex roots only.

Note: Complex roots mean negative discriminants. The square root won't work. What you should do is obtain the absolute value, find the square root, separate your calculation into a real and imaginary part (x+yi) then display using

        cout<<x<<"+"<<y<<"i"<<endl;
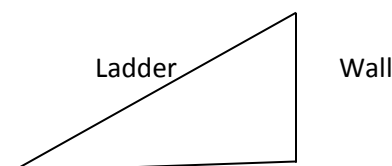
Question 3
Write a program that allows the input of the 2 (shorter) sides of a right-angled triangle and it calculates and displays the length of the hypotenuse, using Pythagora's theorem.

Question 4
Write a program that allows the inputs of x and y coordinates of two points (x1,y1) and (x2,y2), and determines the distance between them. $d = \sqrt{(x2 - x1)^2 + (y2 - y1)^2}$

Question 5
A ladder in leant against a wall as shown below. Write a program that takes as input the length of the ladder and the angle of inclination (from the ground) and calculates and displays the maximum height of the wall against which the ladder can be used.

Ladder   Wall

Question 6

Write a program that allows the input of a value x and calculates and displays the value of $x^5 + 3x^4 + 2x^3$

Question 7

Modify the program in question 6 so that it allows the input of two values x and n and it calculates and displays the value of $x^n + 3x^{n-1} + 2x^{n-2}$

Question 8

Given the length of two sides of a triangle and the size of the angle between the two sides, the length of the third side can be calculated from the Cos Rule: $a^2 = b^2 + c^2 - 2bc \cos A$. Other angles can also be calculated from the sine rule, which is . Furthermore, the area is calculated as
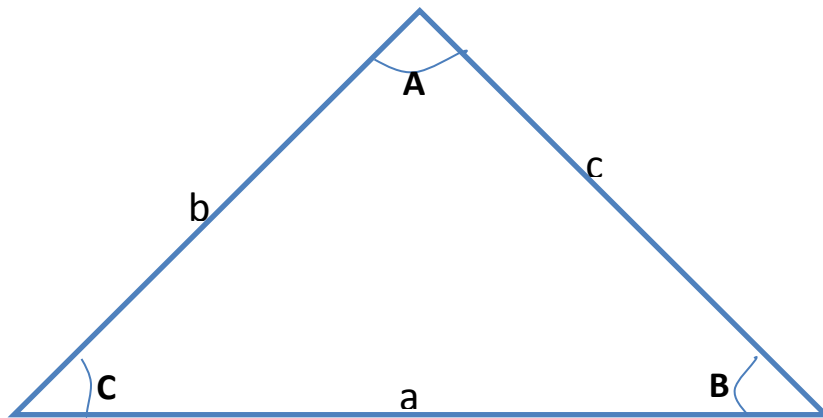
Write a program that allows the input of two sides of a triangle and the angle between the two sides and it displays the length of the 3rd side, the remaining angles as well as the area of the triangle.