Lab 15 – Templates & Standard Template Library

Question 1

Write a program which is capable of calculating Power, Square Root, Sin, Cos and Tan of any data type. For the mathematical calculations you are allowed to use C++ 'cmath' library. Your program should consist of generic function (Function templates) for each operation. Pass the operands to desired function which returns the result after performing appropriate operation.

Question 2

Write a class **Calculator** using templates. The template class shall allow you to perform addition, multiplication and division on integer, double, float and long data types.

Question 3

Write a class ***Vector*** using templates. The template class shall allow provide following functionality. For detailed documentation of vector, please refer yourself to cppreference.com or cplusplus.com

Member function	
constructors	Construct Vector
Vector ();	
Vector (int size);	
Vector (int size, const T& iv);	
Vector (const Vector <T> &);	
destructor	Vector destructor
~ Vector ();	
operator=	Assign content
Iterators:	
begin	Return pointer to beginning of data
end	Return pointer to one element beyond the end of data
Capacity:	
size	Return size

resize(int)	Change size
empty	Test whether Vector is empty, returns true or false
shrink_to_fit(int newsize)	Shrink to fit, drops element from the array to fit the given size
Element access:	
operator[]	Access element
front	Access frst element
back	Access last element
Modifiers:	
push_back	Add element at the end
pop_back	Delete last element
swap	Swap content
clear	Clear content