

Functions and More Functions

80 Points Total

Part 1a

10 Points

Although C++ doesn't have a "secant" function, you should write one. Thus, write a "sec" function and test it with at least 3 angles using this prototype: `double sec(double radian);`

Part 1b

10 Points

Now overload the "secant" function using this prototype: `double sec(int degree);` You will need to change degrees into radians inside the function.

Part 1c

10 Points

Now add a default parameter to your "secant" function using this prototype:

`double sec(double angle, int degrees, bool flag_radian=true);`

where the default angle measurement is radians, degrees is whatever, and the flag_radian parameter is missing or true. If you want the angle in degrees, then it has a valid value, angle is whatever, and flag_radian is false and degrees will need to be converted into radians inside the function.

Part 2

10 Points

Write a function to calculate and return the inverse hyperbolic cosecant given the value of x as an input parameter and this formula:

$$\operatorname{arccsch}(x) = \log_e \left(\frac{1 \pm \sqrt{1+x^2}}{x} \right)$$

where the plus sign is used if $x > 0$, the minus sign if $x < 0$.

Part 3

40 Points

Write a long function with one argument, long input, to return the largest factor less than the square root of the input parameter. Using cin or cout in this function will cost you all credit for this part. Write a main program to test your function. This function uses a loop starting at 2 and ends at the square root of your inputted number, testing each number until it finds a factor and then keeps track of the current largest one and returns the largest one only. If your inputted number is prime, return the initial number.