```
/*******************************************************************************
*       Author:  Jessica Schuler
*       Date Created: 10-18-13
*     Date Modified:  10-21-13
*       Filename: A3.cpp
*
*       Overview:
*              Produces the area under a curve on an x y axis.
*       Input:
*              User inputs a numbers of start, stop, number of slices
*              and what kind of formula they would like.
*       Output:
*              The output is the area under the curve.
*
*******************************************************************************/

#include <iostream>
#include <cmath>

using namespace std;

//This declares my function to calculate the area
float calc_rect_area(float start, float stop, float slices);

int main()
{
   //variables declared
   float start=0;
   float stop=0;
   float slices=0;
   float area = 0;
   char run_again ='1';

   while('1'==run_again)//loop to run again if user wants to
   {
      cout<<"We will now calculate the area under a curve!"<<endl;
      cout<<"Where would you like to start calculating on the x-axis?";
      cin>>start;//gets the start value
      cout<<"Where on the x-axis should we stop calculating? ";
      cin>>stop;//gests the stop value
      cout<<"How many slices would you like to make in the curve? ";
      cin>>slices; //gets the number of rectangles

      calc_rect_area(start, stop, slices);//calls my function to calculate
                                    //the area

      cout<<"Would you like to run this again? "<<endl;//asks to run again
      cout<<"Enter 1 for Yes or 0 for No: ";
      cin>>run_again;//gets the user input if they want to run again

      while (run_again!='1'&&run_again!='0') //checks for valid input
      {
            cout<<"That value is invalid, please enter 1 for Yes or o for No: "<<endl;
                  cin>>run_again;
      }
    }

   return 0;//ends program
}
//this is my function to calculate area
```

```
float calc_rect_area(float start,float stop,float slices)
{
      int i;//counter variable
      float area=0;//declaring area
       float width=(stop-start/slices);//calculation of width)
      float x=width;//variable for width
      int type;//variable to pick which function

            cout<<"Choose which function from the below list to use: "<<endl;
        cout<<"1: 2x^5+x^3-10x+2"<<endl;
        cout<<"2: 6x^2-x+10"<<endl;
        cout<<"3: 5x+3"<<endl;
        cout<<"4: 2x^3+120"<<endl;
        cout<<"5: 2x^2"<<endl;
        cin>>type;//gets user input for what function they want

      if (type<0||type>5)//checks for valid input
      {
         cout<<"You entered an invalid seclection!"<<endl;
         cout<<"Enter a number 1 through 5: ";
         cin>>type;//asks user again for proper input
      }

      for(int i=1; i<=slices; i++)//counts number of times
      {
         if(type==1)//will use this for function 1
         {
            area= (((2*pow(x,5))+(pow(x,3))-(10*x)+(2)));
            i++;
           }
         if(type==2)//will use this for function 2
         {
            area= (((6*pow(x,2))-(x)+(10)));
            i++;
           }
         if(type==3)//will use this for function 3
         {
            area= (((5*x)+(3)));
            i++;
           }
         if(type==4)//will use this for function 4
         {
            area= (((2*pow(x,3))+(120)));
            i++;
           }
         if(type==5)//will use this for function 5
         {
            area= ((2*pow(x,2)));
            i++;
           }
        }
        cout<<"Total Area is: "<<area<<endl;//tells the area
}
```