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Lagrangian polynomial:-

Array a[8] contains all the values of x that are initially given to plot the curve.
And y[8] consists of all the values of y = sin^2(x).
Then by applying the Lagrange formula:-

$$P_i(x) = \prod_{\substack{j=1 \\ i \neq j}}^{n} \frac{(x - x_j)}{(x_i - x_j)}$$

And putting the values of pi(x) into the below equation we get the polynomial function,

$$f_{n-1}(x) = y_1 P_1(x) + y_2 P_2(x) \ldots\ldots + y_n P_n(x)$$

The Lagrange code is :-

```
#include<iostream>
#include<string>
#include<math.h>
using namespace std;

int main(){

    float a[8];
        for(int i=0;i<9;i++){
            a[i] = 2*M_PI*i/8 ;
        }
    float y[8];
    for(int i=0;i<8;i++){
        y[i] = pow(sin(a[i]),2);
    }
    float yp =0;
    float s;
    float x;
    cout<<"Enter x : ";
    cin>>x;
    for(int i=0;i<8;i++){
        s=1;
        for(int j=0;j<8;j++){
            if(i!=j){
                s = s*((x-a[j])/(a[i]-a[j]));
            }
        }
        yp= yp+s*y[i];
    }
    cout<<"The value of f(x) at x = "<<x<<" is :  "<<yp;
}
```

The value of f(x) at x = ∏/3 is :-

```
Enter x : 1.047
The value of f(x) at x = 1.047 is :  0.761092
```