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/*
A program to find out the linear interpolation at a point.
This program is created by Mohammad Sazzad Hossain.
*/

#include <iostream.h>
#include <math.h>

int main ()

{
    float xi, xf, x, fi, ff, f;
    float xii, xff, xx;
    float fr, dfr;
    float pi, df;

    pi = 4 * atan (1);

    cout << " initial point: " ;
    cin >> xii;
    cout << " final point: " ;
    cin >> xff;
    cout << " measure point: " ;
    cin >> xx;

    xi = pi * xii / 180;
    xf = pi * xff / 180;
    x = pi * xx / 180;

    fi = cos (xi);
    ff = cos (xf);

    f = fi + (x - xi) * (ff - fi) / (xf - xi);
    df = (xf - xi) * (xf - xi) / 8;

    fr = cos (x);
    dfr = fr - f;

    cout << "Linear Ip \t Deviation \t Real mag \t A Difference" << endl;
    cout << f << "\t" << df << "\t" << fr << "\t" << dfr << endl;

return (0);
}

```