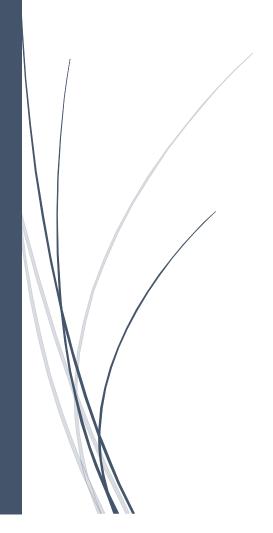
## 12/8/2022

## Polynomial Derivative & Integral Calculator

Bonus Weight-Age Code Hafiz M Abdullah 22K-4489



## Code:

```
#include<stdio.h>
#include<stdlib.h>
int main()
    //All the Inputs are Here.
    int i,j=0,k,num,option;
    printf("What do you Want to perform:\n1.Differentiation\n2.Integeration\n");
    scanf("%d",&option);
    printf("Enter Terms:");
    scanf("%d",&num);
    float ans[num];
    float cof[num];
    float power[num];
    char sign[num];
    //All the Calculation is being done here.
    switch(option)
         case 1:
             for (i=0;i<num;i++)</pre>
                 printf("Sign:");
                 scanf("\n%c",&sign[i]);
                 printf("Co-officient:");
                 scanf("%f",&cof[i]);
//printf("\n%.1fx^",cof[i]));
                 printf("Power:");
                 scanf("%f",&power[i]);
//printf("%.1f",power[i]);
                 ans[i]=cof[i]*power[i];
             //All the printing processes are being done here.
             printf("\setminus nf(x) = ");
             for (i=0;i<num;i++)//this loop is working for printing only f(x).
                 printf(" %c%.1fx^%.1f d(x)",sign[i],cof[i],power[i]);
             printf("\nf'(x)=");
             for (i=0;i<num;i++)//this\ loop\ is\ working\ fot\ printing\ f'(x).
                 if (power[i]<0)</pre>
                      if(sign[i]=='+')// for -ve power and +ve co-officient
                          printf(" %.1fx^%.1f",ans[i],power[i]-1);
                      else if (sign[i]=='-')// for -ve power and -ve co-officient
                          printf(" +%.1fx^%.1f",-1*ans[i],power[i]-1);
                 else if (power[i]==0)
                      printf(" %c0", sign[i]);// if power=0 the term will become 0.
                 else if(power[i]<=1)</pre>
                      printf(" %c%.1f",sign[i],ans[i]);//if power=1 then there will be no subtraction in power.
                 else if(power[i]>1)
                      printf(" %c%.1fx^%.1f", sign[i], ans[i], power[i]-1);
                 printf(" +C");
             break:
```

```
case 2:
             for (i=0;i<num;i++)</pre>
                 printf("Sign:");
                 scanf("\n%c",&sign[i]);
                 printf("Co-officient:");
                 scanf("%f",&cof[i]);
                 //printf("\n%.1fx^",cof[i]));
                 printf("Power:");
                 scanf("%f",&power[i]);
//printf("%.1f",power[i]);
                 ans[i]=cof[i]/(power[i]+1);
             //All the printing processes are being done here.
             printf("\nf(x) = ");
             for (i=0;i<num;i++)//this loop is working for printing only f(x).
                 printf(" %c%.1fx^%.1f",sign[i],cof[i],power[i]);
             printf("\nf'(x)=");
             for (i=0;i<num;i++)//this loop is working fot printing f'(x).
                 if (power[i]<0)</pre>
                     if(sign[i]=='+')// for -ve power and +ve co-officient
                         printf(" %.1fx^%.1f",ans[i],power[i]+1);
                     else if (sign[i]=='-')// for -ve power and -ve co-officient
                         printf(" +%.1fx^%.1f",-1*ans[i],power[i]+1);
                 else if(power[i]>=0)
                     printf(" %c%.1fx^%.1f", sign[i], ans[i], power[i]+1);
}
```

## **Outputs:**

```
What do you Want to perform:

1.Differentiation

2.Integeration

1

Enter Terms:3

Sign:-

Co-officient:3

Power:4

Sign:+

Co-officient:6

Power:4.5

Sign:-

Co-officient:6

Power:-8

f(x) = -3.0x^4.0 +6.0x^4.5 -6.0x^-8.0 d(x)

f'(x)= -12.0x^3.0 +27.0x^3.5 +48.0x^-9.0 +C
```

```
What do you Want to perform:

1.Differentiation

2.Integeration

2
Enter Terms:3
Sign:-
Co-officient:3
Power:6
Sign:+
Co-officient:5
Power:9.4
Sign:-
Co-officient:7
Power:0

f(x) = -3.0x^6.0 +5.0x^9.4 -7.0x^0.0d(x)
f'(x)= -0.4x^7.0 +0.5x^10.4 -7.0x^1.0 +C
```