ÜBUNG 3

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Ü3 A1

#include <stdio.h>

#pragma warning(disable:4996)

double f1(double x) { if (x < -2.0) return -2.0;

if (x < -1.0) return 2.0\*x + 2.0;

if (x < 1.0) return -x\*x + 1;

if (x < 3) return-2.0\*x + 2.0;

else return -4;

}

int main()

{

double x = 0.0; int i = 0;

do{

printf("\n Eingabe x= \n");

i = scanf("%lf", &x); while (getchar() != '\n');

}

while (i == 0);

printf("f1(%lf)=%lf\n", x, f1(x));

getchar();

return 0;

}

Ü3 A2

#include<stdio.h>

#include<math.h>

int main()

{

double pi = 4.0\*atan(1.0), phi = 0.0, r = 0.0;

int i = 0;

do

{

phi = 0.0;

printf("phi[bodenmass]= ");

scanf\_s("%lf", &phi);

while (getchar() != '\n');

} while ((i = 0) || (phi <= -pi) || (pi < phi));

do { r = 0.0; printf("r(r>0)= ");

i = scanf\_s("%lf", &r);

while (getchar() != '\n');

} while ((i == 0) || (r < 0.0));

printf("\n x=%lf y=%lf\n", r\*cos(phi), r\*sin(phi));

getchar();

return 0;

}

Ü3 A3

#include <stdio.h>

#include <math.h>

int main()

{

double x = 0.0, y = 0.0, r = 0.0, phi = 0.0;

double pi = 4.0\*atan(1.0);

int i=0;

printf("Geben Sie kartesische Koordinaten x und y ein!\n");

i = scanf\_s("%lf %lf", &x, &y);

while (getchar() != '\n');

r = sqrt(x\*x / y\*y);

if (x > 0) {

phi = atan(x / y);

}

else if (x < 0) {

if (y > 0) phi = atan(x / y) + phi;

else if (y < 0) phi = atan(x / y) - pi;

else phi = pi;

}

else {

if (y > 0) phi = pi / 2;

else if (y < 0) phi = pi\*-1 / 2;

else phi = 0;

}

printf("Polarkoordinaten: ( %lf ; %lf )", r, phi);

getchar();

return 1;

}

Ü3 A4

#include <stdio.h>

int main()

{

double a, b, c;

int k = 0, i=0;

printf("Geben Sie drei Parameter ein: ");

i = scanf\_s("%lf %lf %lf", &a, &b, &c);

while (getchar() != '\n');

if (a < b + c && b < a + c && c < a + b)

{

if (a != b && b != c && a != c)

k = 1;

else if (a == b&&b == c&&a == c)

k = 3;

else k = 2;

}

else k = 0;

printf("%d", k);

getchar();

}

Ü3A5

3.5.a

#include<stdio.h>

#include<math.h>

int main(intargc, char\* argv[])

{

int k = 0, i = 0;

double g = 1.0, t = 0.0;

do {

do {

printf("\nEingabe x[%d]= ", k);

i = scanf\_s("%lf", &t);

while (getchar() != '\n');

if (t < 0.0) break;

} while (i <= 0);

k++;

if (t < 0.0) break;

g \*= t;

} while (1);

if (k <= 1) g = 0.0;

else g = pow(g, 1.0 / (k-1));

printf("\nGeometrisches Mittel g=%lf, Anzahl=%d\n", g, k - 1);

while (getchar() != EOF);

return 0;

}

3.5.b

#include<stdio.h>

#include<math.h>

int main(intargc, char\* argv[])

{

int k = 0, i = 0;

double g = 0.0, t = 0.0, H = 0.0;

//

do {

do {

printf("\nEingabe x[%d]= ", k);

i = scanf("%lf", &t);

while (getchar() != '\n');

if (t < 0.0) break;

} while (i <= 0 || !t ); // !t ist gleich t==0

k++;

if (t < 0.0) break;

g += 1/t;

} while (1);

//

if (k <= 1)

H = 0.0;

else

H = (k-1)/g;

//

printf("\nHarmonisches Mittel = %.2lf, Anzahl = %2d\n", H, k - 1);

//

while(getchar()!= EOF ) ;

//

return 0;

}

//---------------------------------------------------------------------------

3.5.c

#include<stdio.h>

#include<math.h>

int main(intargc, char\* argv[])

{

int n = 0, i = 0, j = 0;

double g = 0.0, t = 0.0, M = 0.0, x[50];

//

do {

do {

printf("\nEingabe x[%d]= ", n);

i = scanf\_s("%lf", &t);

while (getchar() != '\n');

if (t < 0.0) break;

} while (i <= 0 || !t ); // !t ist gleich t==0

if (t < 0.0) break;

x[n++] = t;

} while(n<50);

//

for(j=0;j<n;j++) g += x[j];

//

if( n>=1 )

g = g/n;

else

g = 0;

//

if (n > 1) {

for(j=0;j<n;j++){

M += pow((x[j]-g),2);

M = sqrt(M/(n-1));

}

}

else

M = 0.0;

//

printf("\nWert des mittleres Fehlers= %2.2lf, X= %2.2lf, Anzahl= %2d\n", M, g, n);

//

while(getchar()!= EOF ) ;

//

return 0;

}

//---------------------------------------------------------------------------