Lösungen für das 5. Praktikum

Funktionen

```
1.
#include <iostream>
#include <math.h>
using namespace std;

double oberflaeche(double r)
{double s;
 s=4*M_PI*r*r;
 return s;
}

double volumen(double r)
{double v;
 v=4.0/3.0*M_PI*r*r*r;
 return v;
}

int main() {
      double r,s,v;
      cout<<"\nRadius: ";
      cin>>r;
      s=oberflaeche(r);
      cout<<"\nKugeloberflaeche:"<<s;
      v=volumen(r);
      cout<<"\nKugelvolumen:"<<v<<endl;
      return 0;
}

2.
#include <iostream>
#include <math.h>
using namespace std;

void funktion(double x, double y, double &wink, int &quad)
{
      wink= atan(y/x);
      if (x>0)
      {     if (y>0) quad=1;
            else quad=4;
      }
      else
      {     if (y>0) quad=2;
            else quad=3;
  }
}

int main(void)
{
      double x, y, wink;
      int quad;

      do
  {   cout<<"\nEingabe x und y:";
            cin>>x>>y;
        if (x!=0 &&y!=0)
```

```
        {
              funktion(x,y,wink,quad);
              cout<<"\nWinkel "<<wink<<" Quadrant "<<quad<<"\n";
        }
  }while (x!=0 &&y!=0);
      return 0;
}
```

3.

```
#include <iostream>
using namespace std;

int eingabe(double x[])
{
 int i,n;
 cout<<"Anzahl= "; cin>>n;
 for (i=0;i<n;i++)
 {cout<<i+1<<". Wert = ";
  cin>>x[i];
 }
return n;
}

void ausgabe(double x[],int n)
{
 int i;
 for (i=0;i<n;i=i+1) cout<<i+1<<". Wert = "<<x[i]<<"\n";
}

double maximum(double x[],int n)
{
 int i;
 double max;
 max=x[0];
 for (i=1;i<n;i=i+1) if (x[i]>max) max=x[i];
 return max;
}

double minimum(double x[],int n)
{
 int i;
 double min;
 min=x[0];
 for (i=1;i<n;i=i+1) if (x[i]<min) min=x[i];
 return min;
}

double mittel(double x[],int n)
{
 int i;
 double s;
 s=0;
 for (i=0;i<n;i=i+1) s=s+x[i];
 return s/n;
}

double streuung(double x[],int n, double mw)
{
 int i;
 double s;
 s=0;
```

```
 for (i=0;i<n;i++) s=s+(x[i]-mw)*(x[i]-mw);
 return s/(n-1);
}
int main(void)
{
 double x[100],
        max,min,mw,st;
 int n;

 n=eingabe(x);
 ausgabe(x,n);
 max=maximum(x,n);
 min=minimum(x,n);
 mw=mittel(x,n);
 st=streuung(x,n,mw);
 cout<<"\nMaximum="<<max<<" Minimum=<<min<<"\n";
 cout<<"Mittelwert="<<mw<<" Streuung="<<st<<"\n";
 return 0;
}
```