

Kapitel 3 / Seite 78*Codeliste 3.1 Prozeduren in Tabelle tblMassenTM*

```
Option Explicit

'Prozedur zur Erstellung eines Formblatts
Sub Formblatt()
'
'Tabelle löschen
  Worksheets("Massenträgheitsmomente").Activate
  Worksheets("Massenträgheitsmomente").Cells.Clear
'
'Formblatt
  Range("A1") = "Form"
  Range("B1:D1").MergeCells = True
  Range("B1") = "Maße"
  Range("C1") = "Maße"
  Range("D1") = "Maße"
  Range("B2") = "a/R [mm]"
  Range("C2") = "b/r [mm]"
  Range("D2") = "h [mm]"
  Range("E1") = "Dichte"
  Range("E2") = "[kg/dm" + Chr(179) + "]"
  Range("F1") = "Masse m"
  Range("F2") = "[kg]"
  Range("G1") = "Moment Id"
  Range("G2") = "[kgm" + Chr(178) + "]"
  Range("H1") = "Abstand x"
  Range("H2") = "[mm]"
  Range("I1") = "Moment Ix"
  Range("I2") = "[kgm" + Chr(178) + "]"
  Range("J1") = "Gesamt Ix"
  Range("J2") = "[kgm" + Chr(178) + "]"
  Range("A:F").ColumnWidth = 10
  Range("G:G").ColumnWidth = 20
  Range("H:H").ColumnWidth = 10
  Range("I:J").ColumnWidth = 20
  Columns("A:J").Select
  Selection.NumberFormat = "0.00"
  Zeile = 3
  Gesamt = 0
  Zelle
End Sub

Sub Quader()
  Load frmQuader
  frmQuader.Show
End Sub
```

```

Sub Zylinder()
    Load frmZylinder
    frmZylinder.Show
End Sub

Sub Kugel()
    Load frmKugel
    frmKugel.Show
End Sub

Sub Kegel()
    Load frmKegel
    frmKegel.Show
End Sub

Sub Ring()
    Load frmRing
    frmRing.Show
End Sub

```

Codeliste 3.2 Prozeduren im Formblatt frmKegel

```

Option Explicit

Private Sub cmdKegel_Click()
    Kegel
End Sub

Private Sub UserForm_Activate()
    TextBox1.SetFocus
End Sub

Sub Kegel()
    Dim r1, r2, h, d, x As Double
    Dim m, Id, Ix As Double
    r1 = Val(TextBox1)
    r2 = Val(TextBox2)
    h = Val(TextBox3)
    d = Val(TextBox4)
    x = Val(TextBox5)
    m = 3.1415926 / 3 * h * (r1 * r1 + r1 * r2 + r2 * r2) / 1000000 * d
    Id = 0.3 * m * (r1 ^ 5 - r2 ^ 5) / (r1 ^ 3 - r2 ^ 3) / 1000000
    Ix = Id + m * x * x / 1000000
    Gesamt = Gesamt + Ix
    If Zeile = 0 Then Zeile = 3
    Cells(Zeile, 1) = "Kegel"
    Cells(Zeile, 2) = r1
    Cells(Zeile, 3) = r2
    Cells(Zeile, 4) = h
    Cells(Zeile, 5) = d
    Cells(Zeile, 6) = m
    Cells(Zeile, 7) = Id
    Cells(Zeile, 8) = x
    Cells(Zeile, 9) = Ix
    Cells(Zeile, 10) = Gesamt
    Zeile = Zeile + 1
    Zelle
    Unload Me
End Sub

```

Codeliste 3.3 Prozeduren im Formblatt frmKugel

```
Option Explicit

Private Sub cmdKugel_Click()
    Kugel
End Sub

Private Sub UserForm_Activate()
    TextBox1.SetFocus
End Sub

Sub Kugel()
    Dim r1, r2, d, x As Double
    Dim m, Id, Ix As Double
    r1 = Val(TextBox1)
    r2 = Val(TextBox2)
    d = Val(TextBox4)
    x = Val(TextBox5)
    m = (r1 ^ 3 - r2 ^ 3) * 4 / 3 * 3.1415926 / 1000000 * d
    Id = 0.4 * m * (r1 ^ 5 - r2 ^ 5) / (r1 ^ 3 - r2 ^ 3) / 1000000
    Ix = Id + m * x * x / 1000000
    Gesamt = Gesamt + Ix
    If Zeile = 0 Then Zeile = 3
    Cells(Zeile, 1) = "Kugel"
    Cells(Zeile, 2) = r1
    Cells(Zeile, 3) = r2
    Cells(Zeile, 4) = ""
    Cells(Zeile, 5) = d
    Cells(Zeile, 6) = m
    Cells(Zeile, 7) = Id
    Cells(Zeile, 8) = x
    Cells(Zeile, 9) = Ix
    Cells(Zeile, 10) = Gesamt
    Zeile = Zeile + 1
    Zelle
    Unload Me
End Sub
```

Codeliste 3.4 Prozeduren im Formblatt frmQuader

```
Option Explicit

Private Sub cmdQuader_Click()
    Quader
End Sub

Private Sub UserForm_Activate()
    TextBox1.SetFocus
End Sub

Sub Quader()
    Dim a, b, h, d, x As Double
    Dim m, Id, Ix As Double
    a = Val(TextBox1)
    b = Val(TextBox2)
    h = Val(TextBox3)
    d = Val(TextBox4)
    x = Val(TextBox5)
    m = a * b * h / 1000000 * d
    Id = m / 12 * (a * a + b * b) / 1000000
    Ix = Id + m * x * x / 1000000
    Gesamt = Gesamt + Ix
    If Zeile = 0 Then Zeile = 3
    Cells(Zeile, 1) = "Quader"
    Cells(Zeile, 2) = a
    Cells(Zeile, 3) = b
    Cells(Zeile, 4) = h
End Sub
```

```

Cells(Zeile, 5) = d
Cells(Zeile, 6) = m
Cells(Zeile, 7) = Id
Cells(Zeile, 8) = x
Cells(Zeile, 9) = Ix
Cells(Zeile, 10) = Gesamt
Zeile = Zeile + 1
Zelle
Unload Me
End Sub

```

Codeliste 3.5 Prozeduren im Formblatt frmRing

```

Option Explicit

Private Sub cmdRing_Click()
    Ring
End Sub

Private Sub UserForm_Activate()
    TextBox1.SetFocus
End Sub

Sub Ring()
    Dim r1, r2, d, x As Double
    Dim m, Id, Ix As Double
    r1 = Val(TextBox1)
    r2 = Val(TextBox2)
    d = Val(TextBox4)
    x = Val(TextBox5)
    m = 2 * 3.1415926 ^ 2 * r2 * r2 * r1 / 1000000 * d
    Id = m * (r1 * r1 + 3 / 4 * r2 * r2) / 1000000
    Ix = Id + m * x * x / 1000000
    Gesamt = Gesamt + Ix
    If Zeile = 0 Then Zeile = 3
    Cells(Zeile, 1) = "Ring"
    Cells(Zeile, 2) = r1
    Cells(Zeile, 3) = r2
    Cells(Zeile, 4) = ""
    Cells(Zeile, 5) = d
    Cells(Zeile, 6) = m
    Cells(Zeile, 7) = Id
    Cells(Zeile, 8) = x
    Cells(Zeile, 9) = Ix
    Cells(Zeile, 10) = Gesamt
    Zeile = Zeile + 1
    Zelle
    Unload Me
End Sub

```

Codeliste 3.6 Prozeduren im Formblatt frmZylinder

```

Option Explicit

Private Sub cmdRing_Click()
    Ring
End Sub

Private Sub UserForm_Activate()
    TextBox1.SetFocus
End Sub

Sub Ring()
    Dim r1, r2, d, x As Double
    Dim m, Id, Ix As Double
    r1 = Val(TextBox1)
    r2 = Val(TextBox2)

```

```
d = Val(TextBox4)
x = Val(TextBox5)
m = 2 * 3.1415926 ^ 2 * r2 * r2 * r1 / 1000000 * d
Id = m * (r1 * r1 + 3 / 4 * r2 * r2) / 1000000
Ix = Id + m * x * x / 1000000
Gesamt = Gesamt + Ix
If Zeile = 0 Then Zeile = 3
Cells(Zeile, 1) = "Ring"
Cells(Zeile, 2) = r1
Cells(Zeile, 3) = r2
Cells(Zeile, 4) = ""
Cells(Zeile, 5) = d
Cells(Zeile, 6) = m
Cells(Zeile, 7) = Id
Cells(Zeile, 8) = x
Cells(Zeile, 9) = Ix
Cells(Zeile, 10) = Gesamt
Zeile = Zeile + 1
Calle Zelle
Unload Me
End Sub
```

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Codeliste 7.5 Prozeduren im Modul modLosgröße

```

Option Explicit

Public MyDoc As Object 'As Worksheet
Public DTitel, xTitel, yTitel As String

Sub Losgroesse_Datengrafik()
    Dim lngNumRows, lngNumCols As Long
    'Verweis auf Worksheet mit Daten
    Set MyDoc = ThisWorkbook.Worksheets("Losgroesse")
    'Übergabe der Anzahl der Spalten/Zeilen:
    lngNumRows = MyDoc.UsedRange.Rows.Count
    lngNumCols = MyDoc.UsedRange.Columns.Count
    'Neues Diagramm
    Charts.Add
    ActiveChart.ChartType = xlLineStacked100
    ActiveChart.SetSourceData Source:=Worksheets("Losgroesse"). _
    Range("A1:E" + LTrim(Str(lngNumRows))), PlotBy:=xlColumns
    ActiveChart.Location Where:=xlLocationAsObject, Name:="Losgroesse"
    With ActiveChart
        .HasTitle = True
        .ChartTitle.Characters.Text = "KOSTENVERLAUF"
        .Axes(xlCategory, xlPrimary).HasTitle = True
        .Axes(xlCategory, xlPrimary).AxisTitle.Characters.Text = "Losgröße"
        .Axes(xlValue, xlPrimary).HasTitle = True
        .Axes(xlValue, xlPrimary).AxisTitle.Characters.Text = "Kosten"
    End With
End Sub

```

Die entsprechende Auswertung liefert:

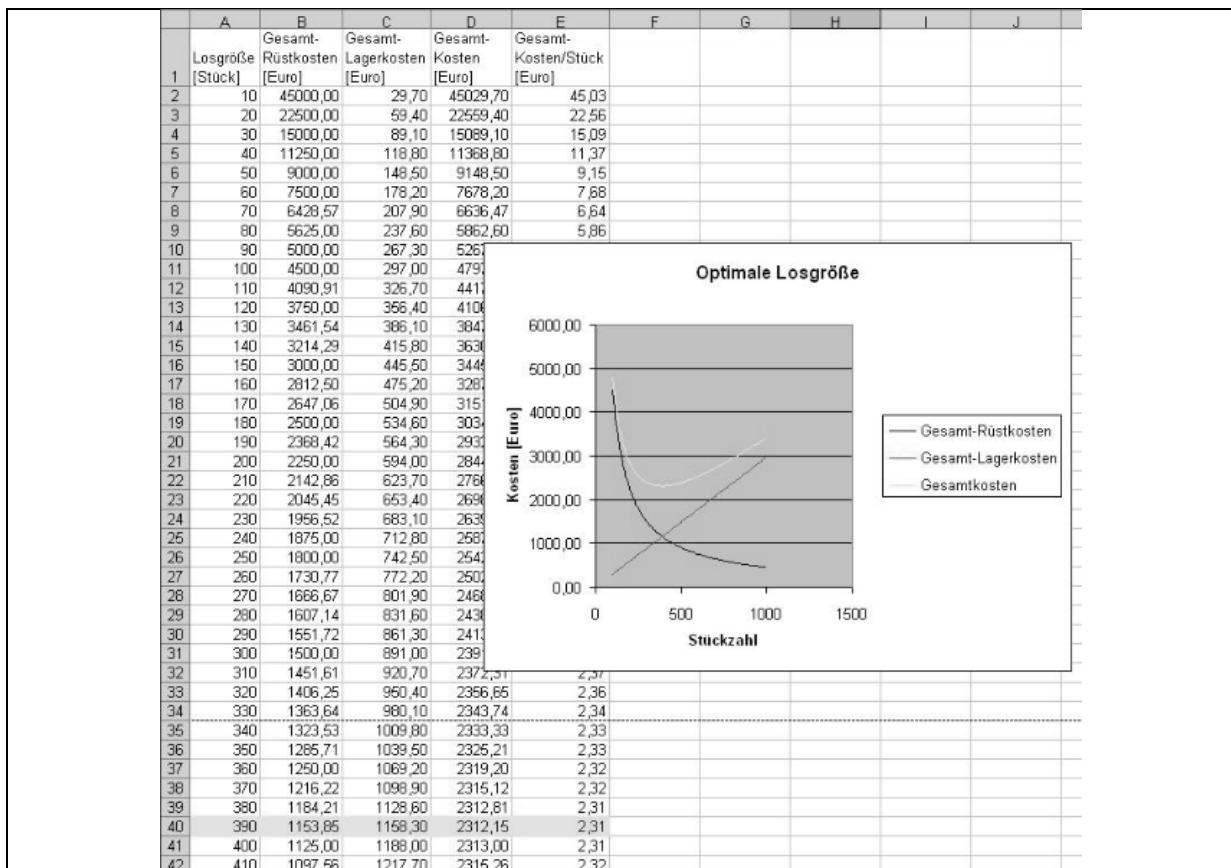


Bild 7-1. Testdatenauswertung

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Die Gaskonstante für Luft beträgt 287,05 J / (kg K). Entsprechend liefert das Beispiel andere Werte. Entsprechend ist der Wert in der Codeliste 9.2 in der Prozedur Kreisprozesse_Testdaten abzuändern.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Masse m [kg]	1					->	v [m³/kg]	p [Pa]	W [J]	Wt [J]	Q [J]
2	Gaskonstante R [J/kg K]	287,05					1	1,511	19.000	1,473	-1,473	1,473
3	Adiabatenexponent x	1,4					1	1,595	18.000	1,553	-1,553	1,553
4	Schrittzahl	10					1	1,689	17.000	1,642	-1,642	1,642
5							1	1,794	16.000	1,741	-1,741	1,741
6							1	1,914	15.000	1,854	-1,854	1,854
7	Zustand Nr.	1	2	3	4		1	2,050	14.000	1,982	-1,982	1,982
8	Zustandsänderung	Is	Ad	Is	Ad		1	2,208	13.000	2,129	-2,129	2,129
9	p [Pa]	20	10	2	4		1	2,392	12.000	2,300	-2,300	2,300
10	v [m³/kg]	1,43525	2,8705	9,06195372	4,53097686		1	2,610	11.000	2,501	-2,501	2,501
11	T [grd K]	1000	1000	-125625,353	631,385036		1	2,871	10.000	2,740	-2,740	2,740
12							2	3,047	9.200	1,691	-2,367	
13							2	3,251	8.400	1,800	-2,519	
14							2	3,492	7.600	1,927	-2,697	
15							2	3,781	6.800	2,079	-2,909	
16							2	4,134	6.000	2,263	-3,166	
17							2	4,579	5.200	2,492	-3,486	
18							2	5,160	4.400	2,786	-3,896	
19							2	5,955	3.600	3,181	-4,446	
20							2	7,126	2.800	3,747	-5,232	
21							3	8,238	2.200	-1,730	1,730	-1,730
22							3	7,552	2.400	-1,579	1,579	-1,579
23							3	6,971	2.600	-1,452	1,452	-1,452
24							3	6,473	2.800	-1,344	1,344	-1,344
25							3	6,041	3.000	-1,251	1,251	-1,251
26							3	5,664	3.200	-1,171	1,171	-1,171
27							3	5,331	3.400	-1,099	1,099	-1,099
28							3	5,034	3.600	-1,036	1,036	-1,036
29							3	4,769	3.800	-0,980	0,980	-0,980
30							4	3,563	5.600	-4,646	6,475	
31							4	2,978	7.200	-3,747	5,232	
32							4	2,580	8.800	-3,181	4,446	
33							4	2,290	10.400	-2,786	3,896	
34							4	2,067	12.000	-2,492	3,486	
35							4	1,890	13.600	-2,263	3,166	
36							4	1,746	15.200	-2,079	2,909	
37							4	1,626	16.800	-1,927	2,697	
38							4	1,523	18.400	-1,800	2,519	
39							4	1,435	20.000	-1,691	2,367	
40												
41										3,625	-1,796	8,271

