

# Lösungen

1

```
Remove["Global`*"]
```

```
Integrate[x y Sin[z]+y^2-x,{x,-1,0}]
```

$$\frac{1}{2} + y^2 - \frac{1}{2} y \sin[z]$$

```
Integrate[Integrate[x y Sin[z]+y^2-x,{x,-1,0]},{y,1,2}]
```

$$\frac{17}{6} - \frac{3 \sin[z]}{4}$$

```
Integrate[Integrate[Integrate[x y Sin[z]+y^2-x,{x,-1,0]},{y,1,2]},{z,0,1}]
```

$$\frac{1}{12} (25 + 9 \cos[1])$$

```
N[%]
```

```
2.48856
```

2

```
Remove["Global`*"]
```

```
f[x_,y_]:=-x+x(y+1)^2;
```

```
f[x,y]
```

$$-x + x (1 + y)^2$$

```
Integrate[f[x,y],x]+c1
```

$$c1 + x^2 y + \frac{x^2 y^2}{2}$$

```
Integrate[Integrate[f[x,y],x]+c1,y]+c2
```

$$c2 + c1 y + \frac{x^2 y^2}{2} + \frac{x^2 y^3}{6}$$

```
Integrate[f[x,y],{x,0,Sqrt[1-y^2]}]
```

$$y + \frac{y^2}{2} - y^3 - \frac{y^4}{2}$$

```
Integrate[Integrate[f[x,y],{x,0,Sqrt[1-y^2]}],{y,0,1}]
```

$$\frac{19}{60}$$

```
N[%]
```

```
0.316667
```

---

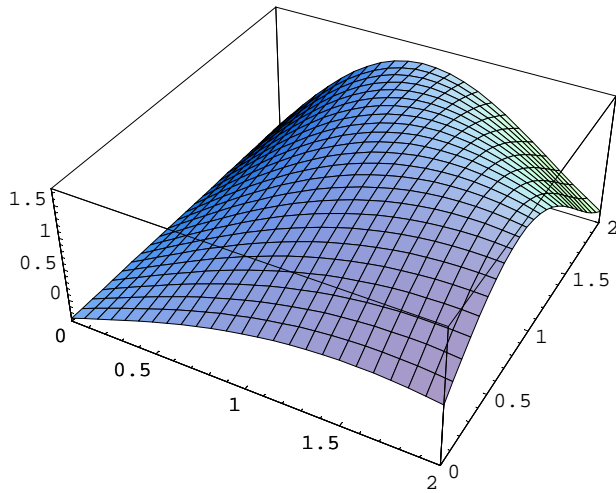
### 3

```
Remove["Global`*"]
```

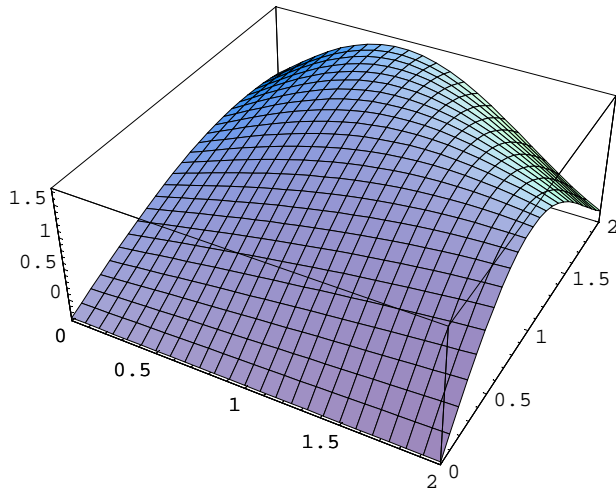
```
g1[x_,y_]:=Sin[x y]+Sin[x]-0.3;
```

```
g2[x_,y_]:=Sin[x y]+Sin[y]-0.3;
```

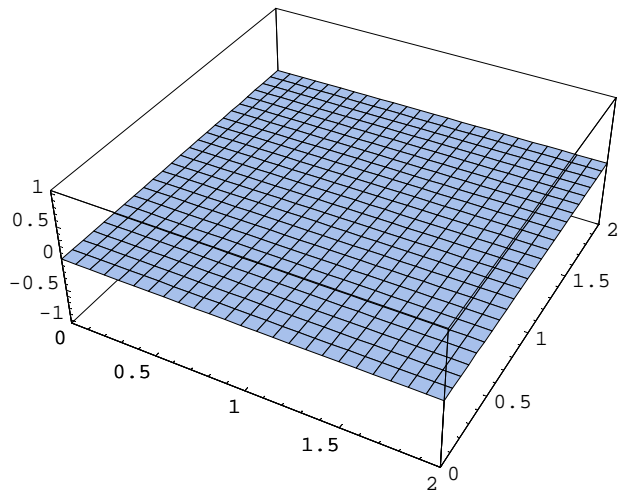
```
p11=Plot3D[g1[x,y],{x,0,2},{y,0,2}];
```



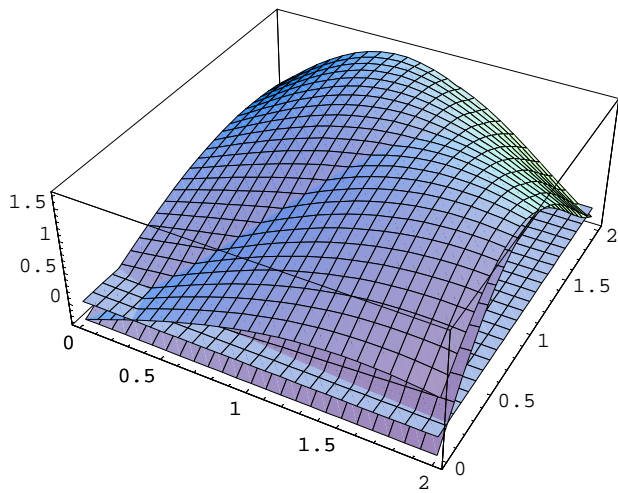
```
p12=Plot3D[g2[x,y],{x,0,2},{y,0,2}];
```



```
p13=Plot3D[0,{x,0,2},{y,0,2}];
```



```
Show[p11,p12,p13]
```



- Graphics3D -

```
FindRoot[{g1[x,y]==0,g2[x,y]==0},{x,0},{y,0}]
```

```
{x -> 0.243254, y -> 0.243254}
```

```
FindRoot[{g1[x,y]==0,g2[x,y]==0},{x,1},{y,1}]
```

```
{x -> 0.243254, y -> 0.243254}
```

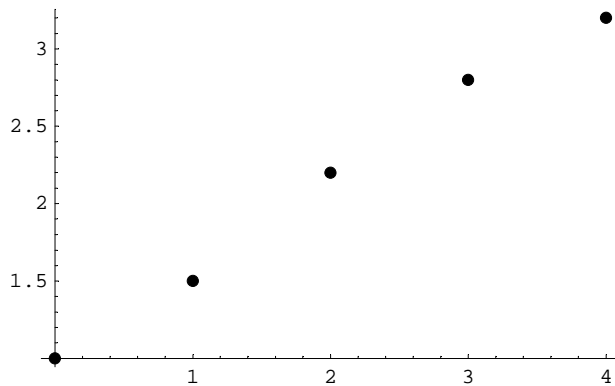
---

## 4

```
Remove["Global`*"]
```

```
p1={0,1.0};  
p2={1,1.5};  
p3={2,2.2};  
p4={3,2.8};  
p5={4,3.2};  
points={p1,p2,p3,p4,p5}  
  
{ {0, 1.}, {1, 1.5}, {2, 2.2}, {3, 2.8}, {4, 3.2} }
```

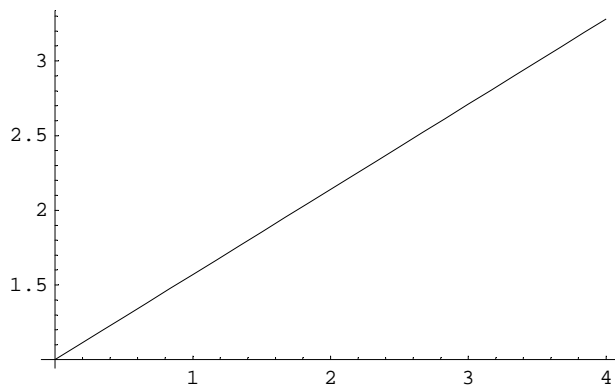
```
plotpoints=ListPlot[points,PlotStyle->PointSize[0.02]];
```



```
linearfit=Fit[points,{1,x},x]
```

1. + 0.57 x

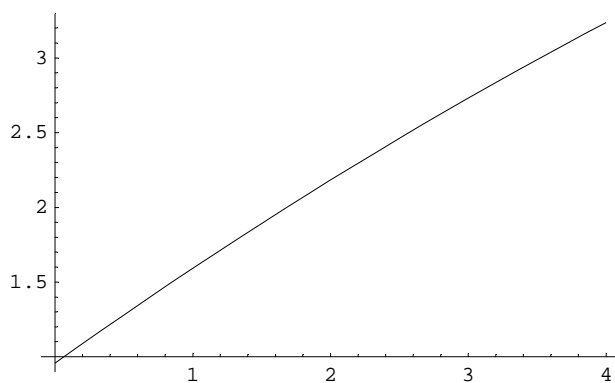
```
lplotline=Plot[%,{x,0,4}];
```



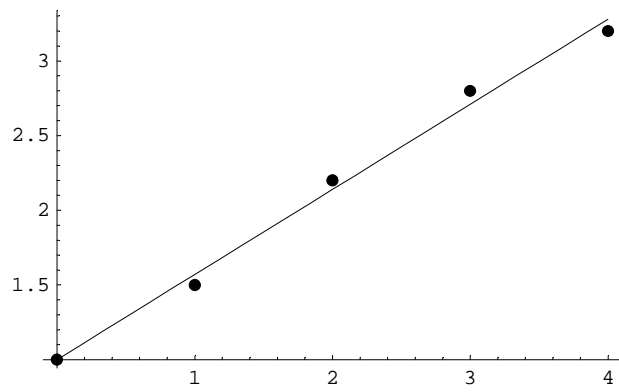
```
squarefit=Fit[points,{1,x,x^2},x]
```

0.957143 + 0.655714 x - 0.0214286 x<sup>2</sup>

```
splotline=Plot[%,{x,0,4}];
```



```
Show[plotpoints,lplotline];
```



```
Show[plotpoints,lplotline,splotline];
```

