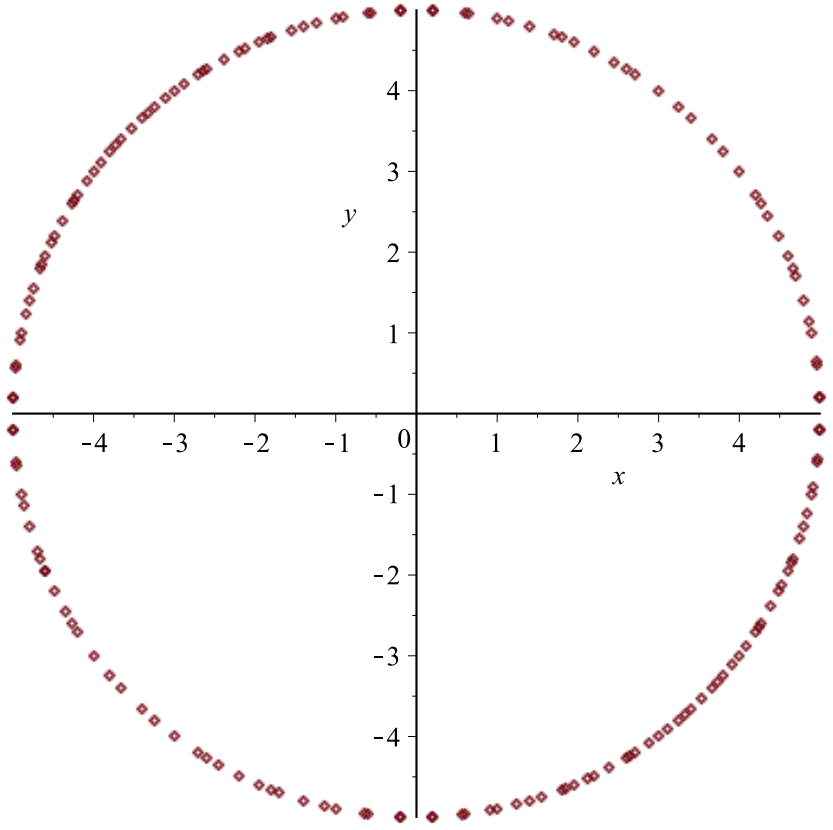
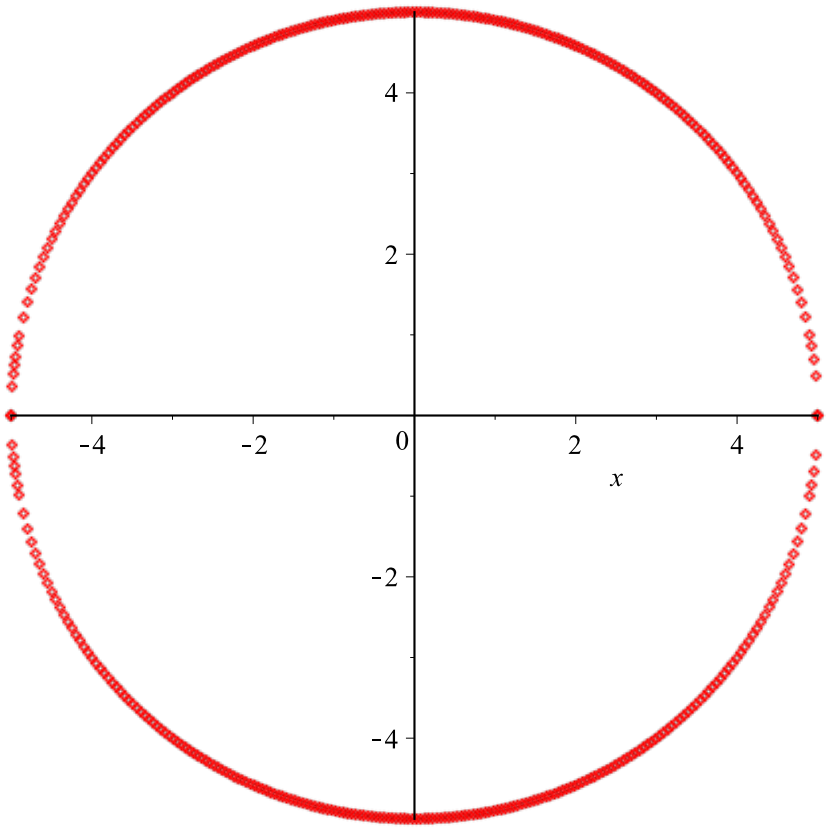
```
> plot(x^2+y^2=25, x=-5..5, y=-5..5);
```

Error, invalid input: plot expects its 1st argument, p, to be of type {array, list, rtable, set, algebraic, procedure, And (`module`, appliable)}, but received x^2+y^2 = 25

```
> with(plots):
> implicitplot(x^2+y^2=25, x=-5..5, y=-5..5);
```

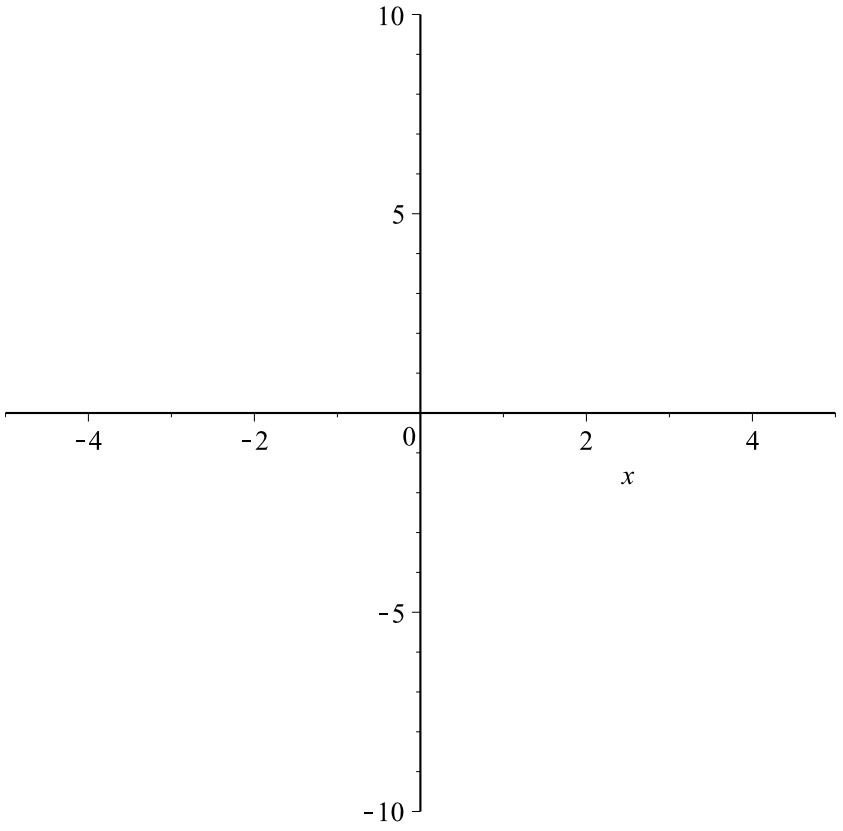



```
> plot([sqrt(25-x^2), -sqrt(25-x^2)], x=-5..5, color=red);
```

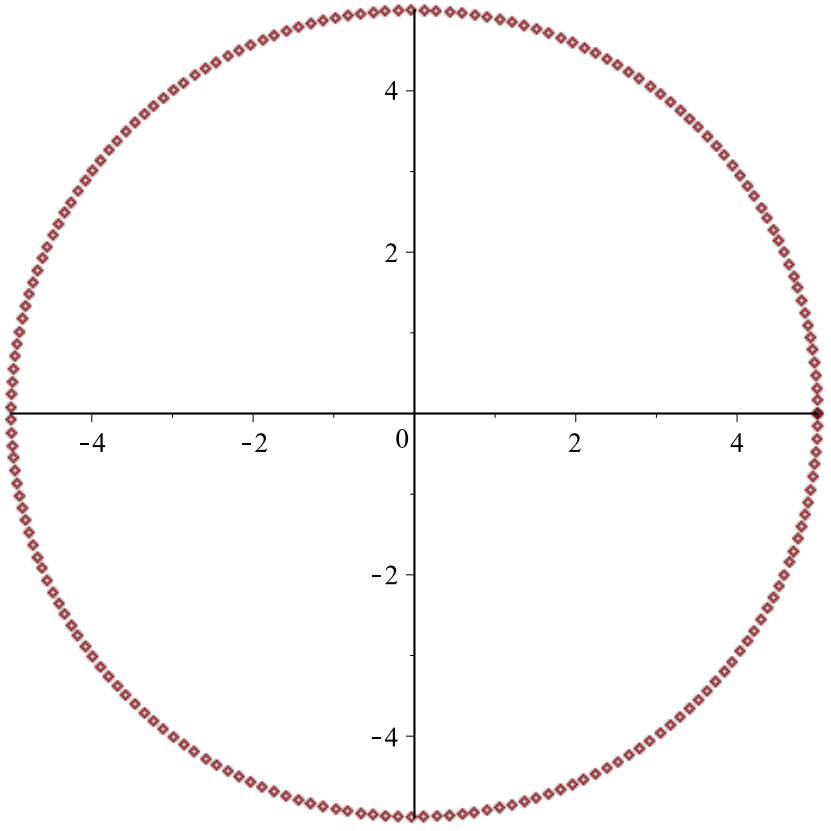


> $plot([\pm \mathrm{sqrt}(25 - x^2)], x = -5..5);$

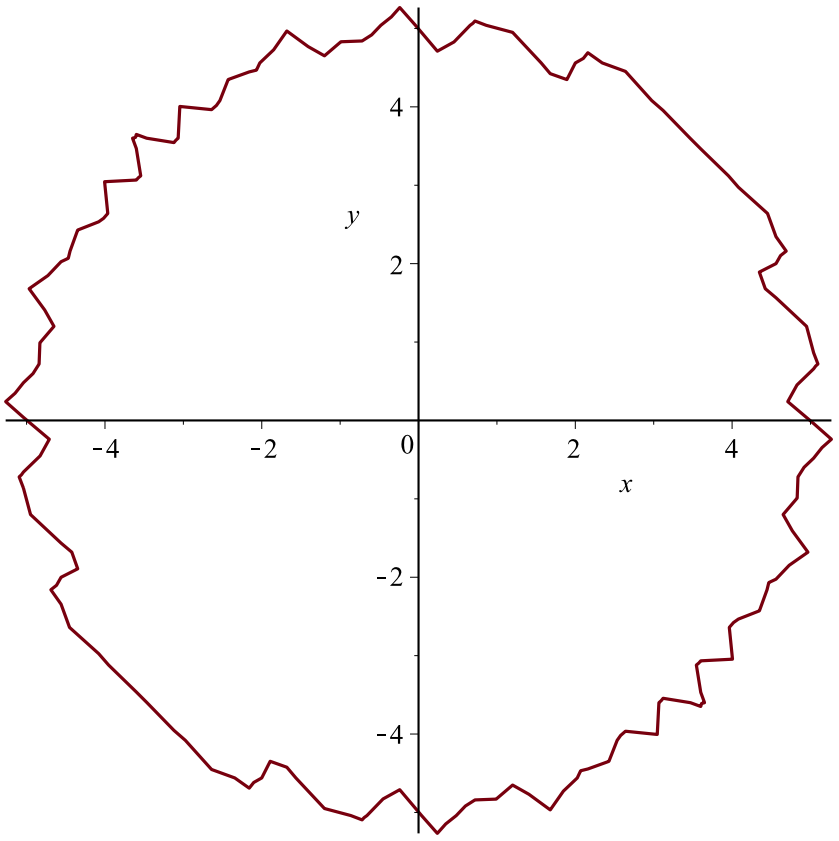
Warning, expecting only range variable x in expression `&+-`((-x^2+25)^(1/2)) to be plotted but found name `&+-`



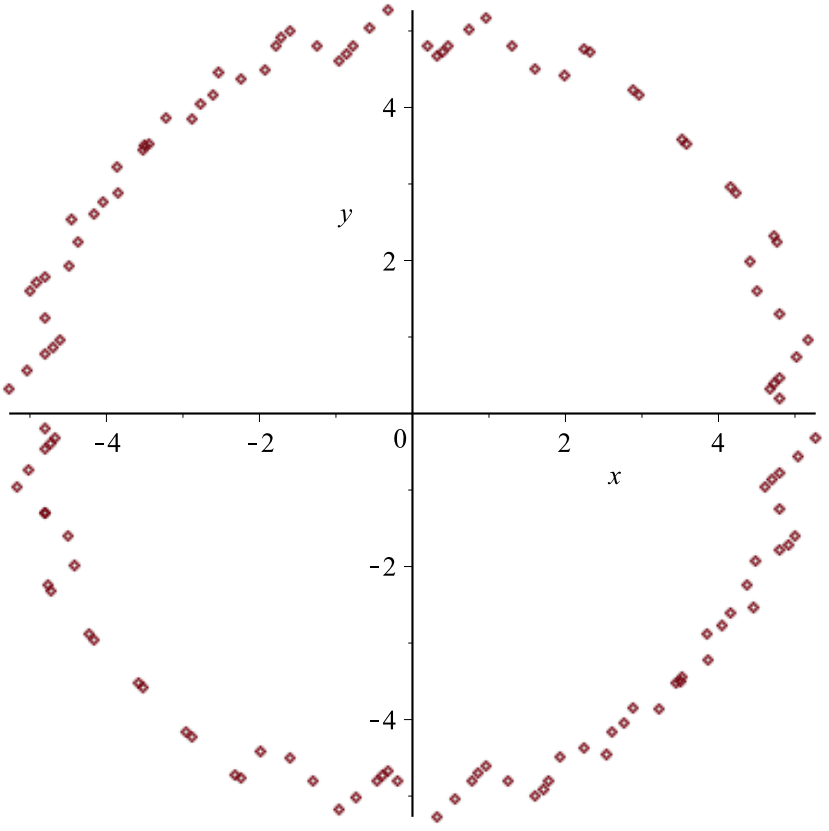

```
> plot([5 cos(t), 5 sin(t), t = 0 ..2 Pi]);
```



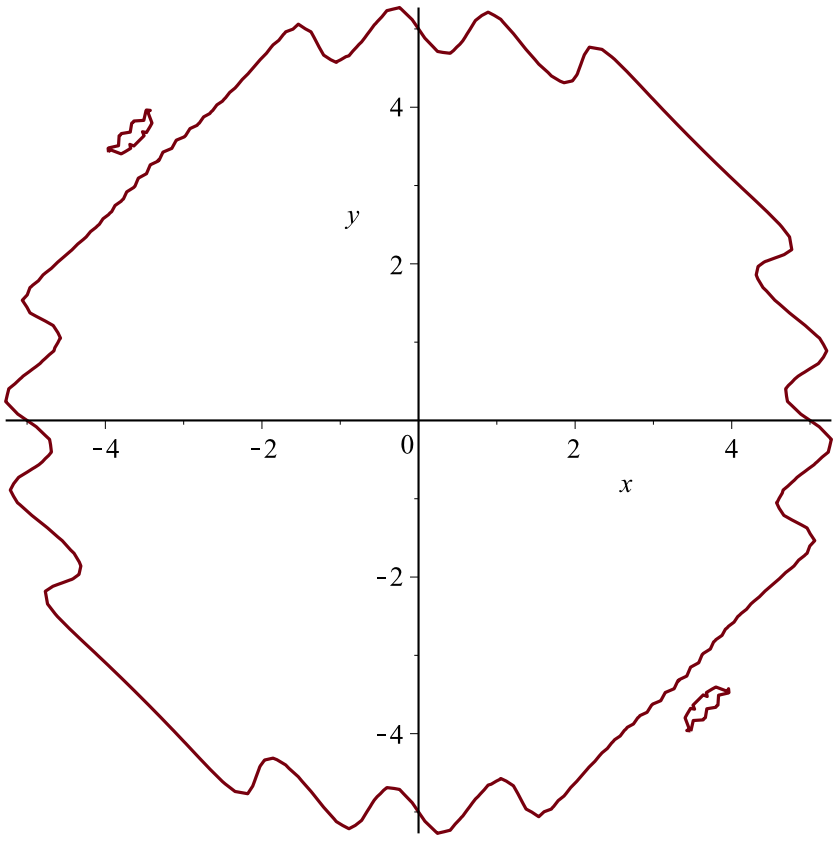
> $implicitplot\left(x^2+y^2+3\sin(x\cdot y)=25, x=-6..6, y=-6..6\right);$



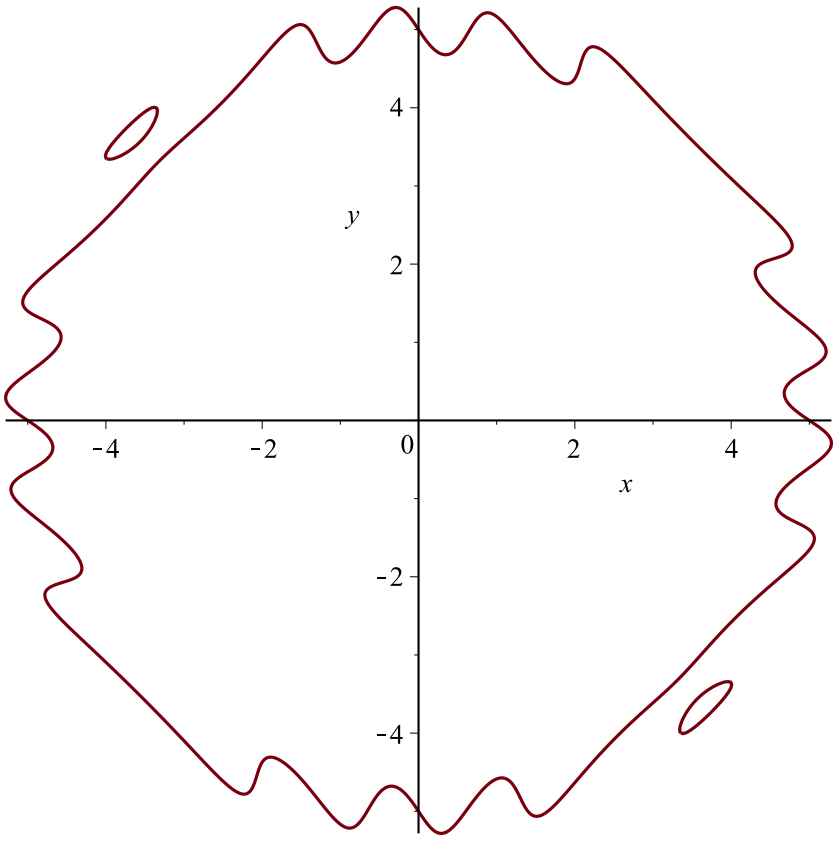
> $implicitplot\left(x^2+y^2+3\sin(x\cdot y)=25, x=-8..8, y=-8..8, style=point\right);$



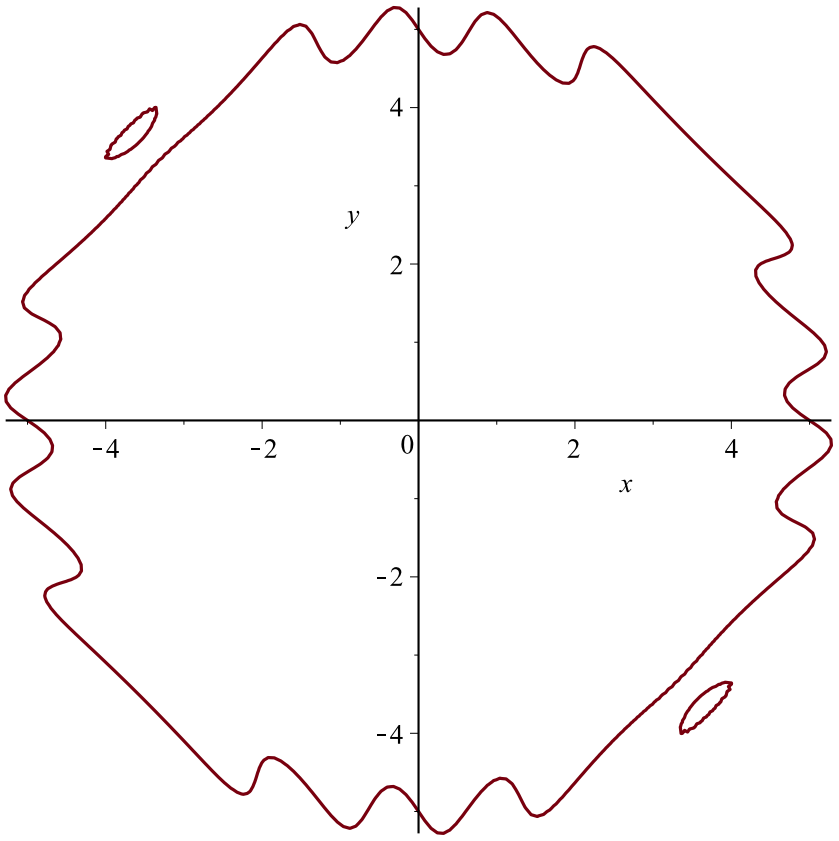
> $implicitplot\left(x^2+y^2+3\sin(x\cdot y)=25, x=-8..8, y=-8..8, \text{grid}=[100, 100]\right);$



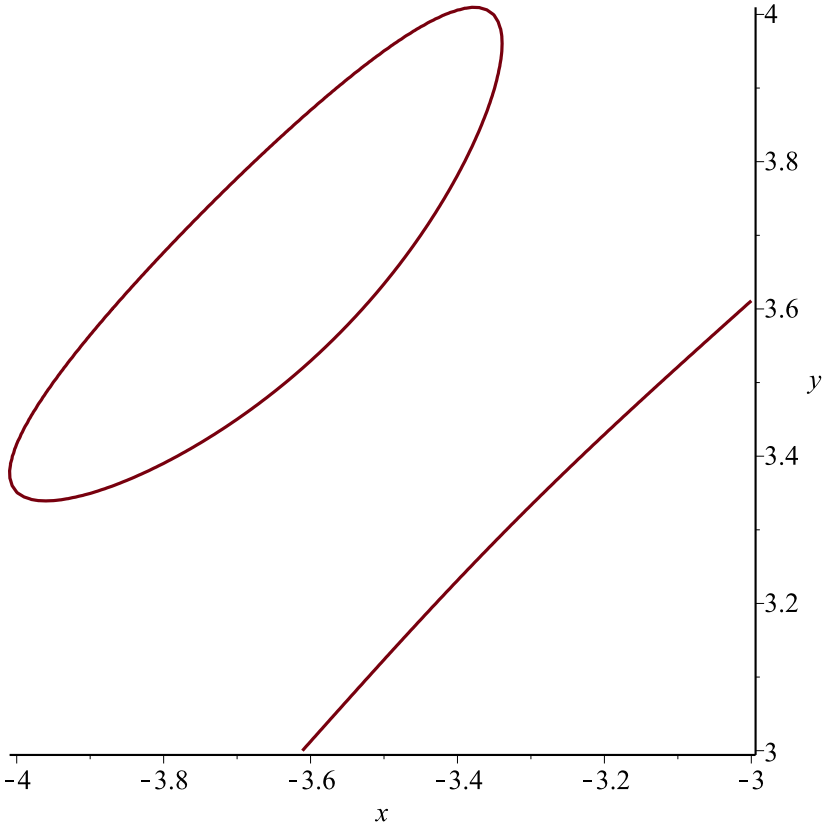
> $implicitplot\left(x^2+y^2+3\sin(x\cdot y)=25, x=-8..8, y=-8..8, \text{grid}=[500, 500]\right);$



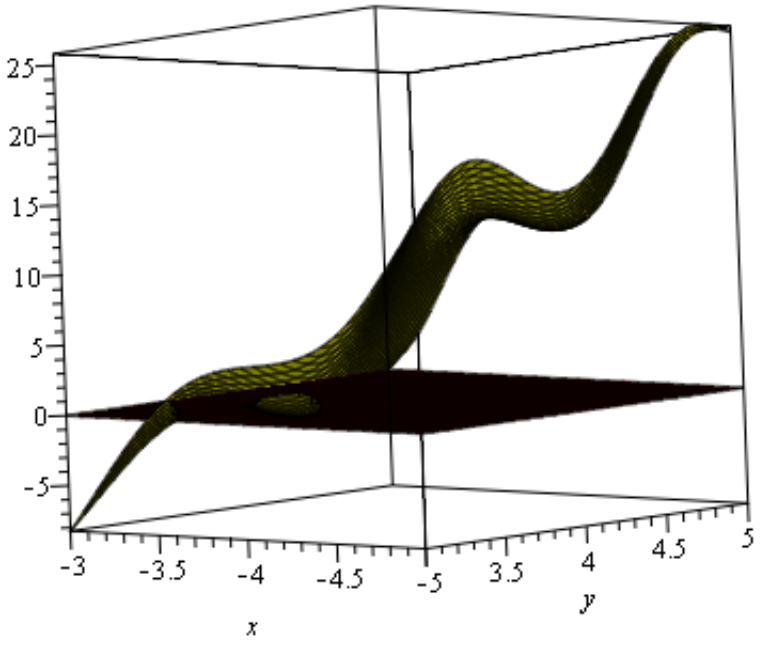
> $implicitplot\left(x^2+y^2+3\sin(x\cdot y)=25, x=-8..8, y=-8..8, \text{gridrefine}=3\right)$



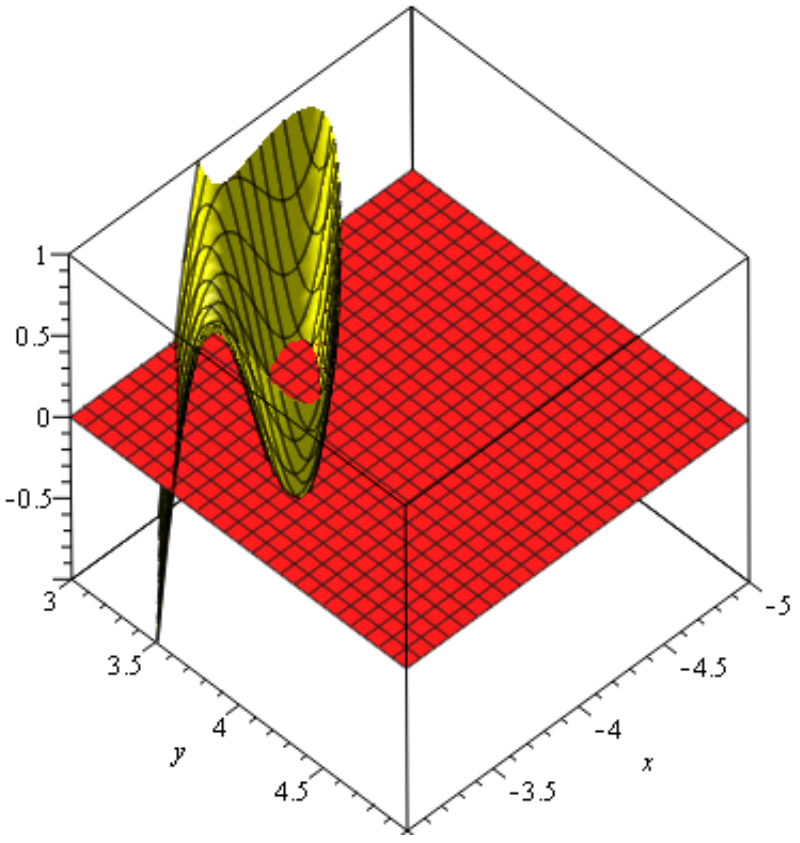
> $implicitplot\left(x^2+y^2+3\sin(x\cdot y)=25,\ x=-5..-3,\ y=3..5,\ gridrefine=3\right)$



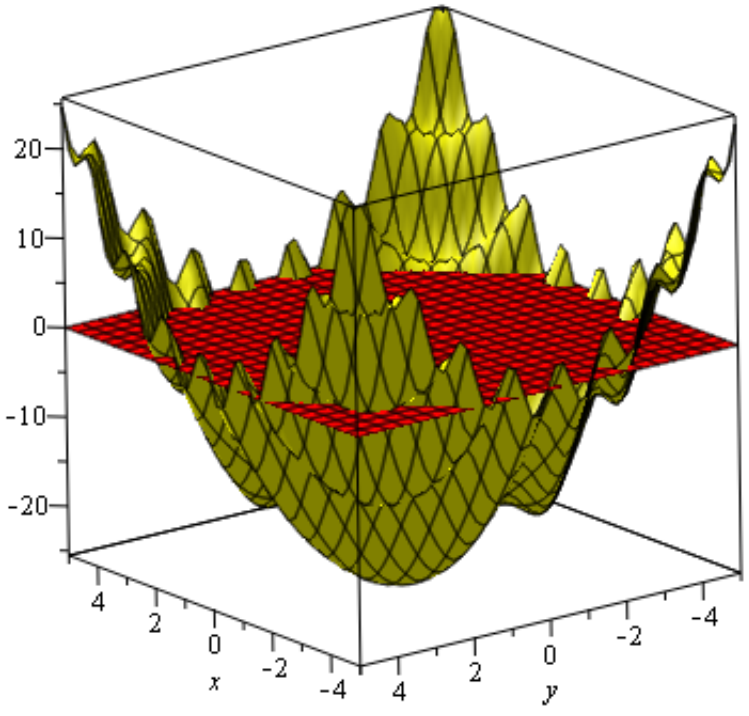
> $plot3d([0, x^2+y^2+3\sin(x\cdot y)-25], x=-5..-3, y=3..5, color=[red, yellow]);$




```
> plot3d( [0, x^2 + y^2 + 3 sin(x·y) - 25], x = -5 .. -3, y = 3 ..5, color = [red, yellow], view = -1 ..1 );
```



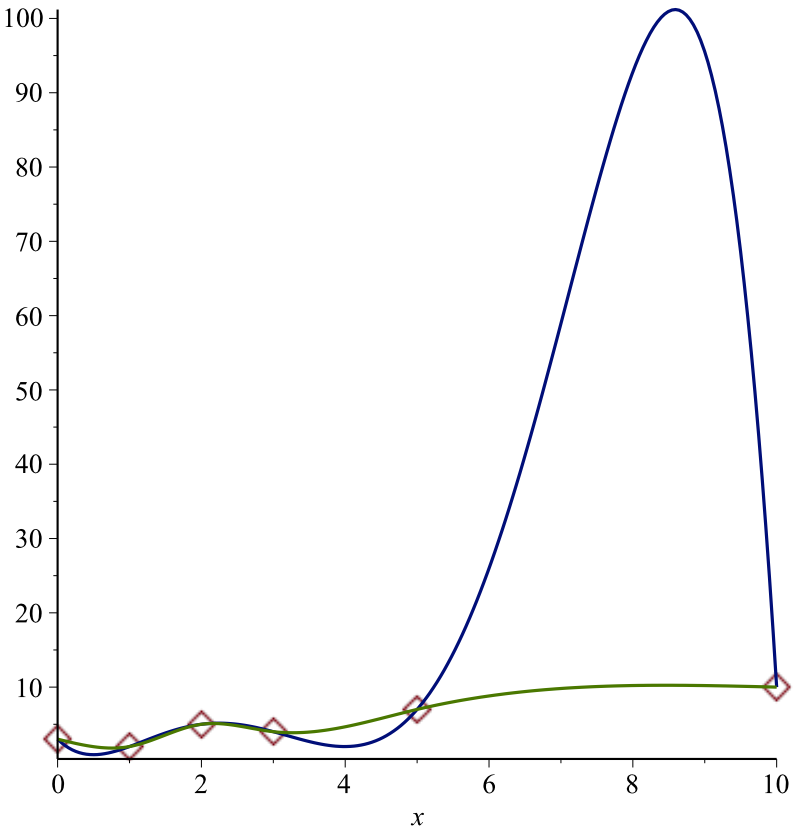

```
> plot3d( [0, x^2 + y^2 + 3 sin(x·y) - 25], x =-5 ..5, y =-5 ..5, color = [red, yellow]);
```




```
> data := [[0, 3], [1, 2], [2, 5], [3, 4], [5, 7], [10, 10]];
```

$$data := [[0, 3], [1, 2], [2, 5], [3, 4], [5, 7], [10, 10]] \quad (1)$$

```
> with(CurveFitting) :
> polly := PolynomialInterpolation(data, x) :
  cracker := Spline(data, x) :
> plot([data, polly, cracker], x = 0 ..10, style = [point, line, line], symbolsize = 25);
```



> *polly*, *cracker*;

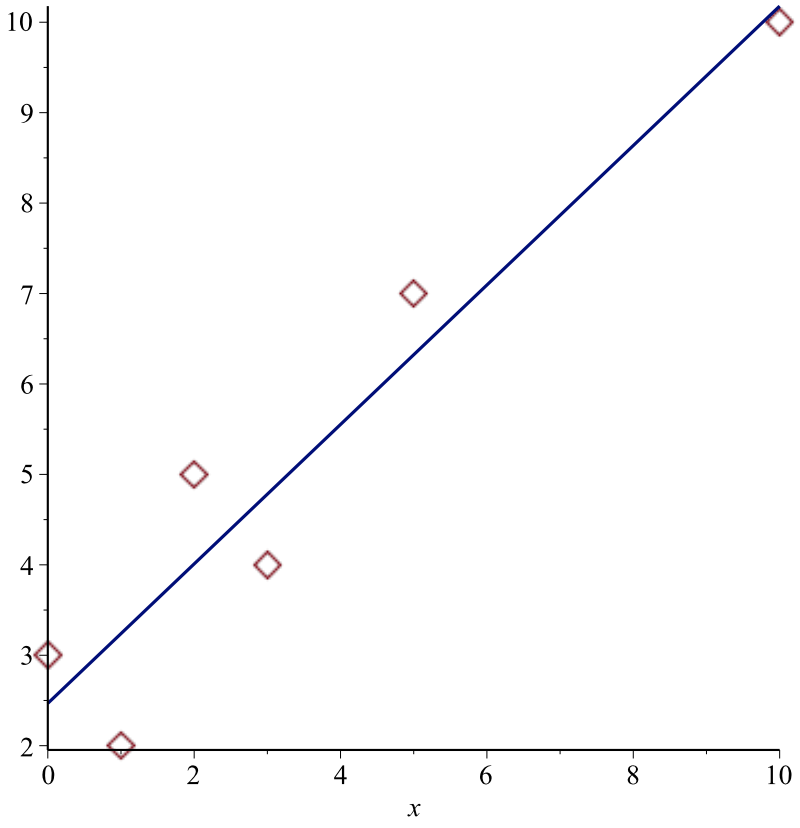
$$-\frac{1261}{25200}x^5+\frac{24161}{25200}x^4-\frac{147041}{25200}x^3+\frac{341311}{25200}x^2-\frac{2693}{280}x+3$$

$$\begin{cases} \frac{76}{55}x^3-\frac{131}{55}x+3 & x<1 \\ -\frac{32}{11}x^3+\frac{708}{55}x^2-\frac{839}{55}x+\frac{401}{55} & x<2 \\ \frac{124}{55}x^3-\frac{996}{55}x^2+\frac{2569}{55}x-\frac{1871}{55} & x<3 \\ -\frac{197}{440}x^3+\frac{2733}{440}x^2-\frac{11551}{440}x+\frac{3427}{88} & x<5 \\ \frac{37}{1100}x^3-\frac{111}{110}x^2+\frac{197}{20}x-\frac{467}{22} & otherwise \end{cases} \quad \textbf{(2)}$$

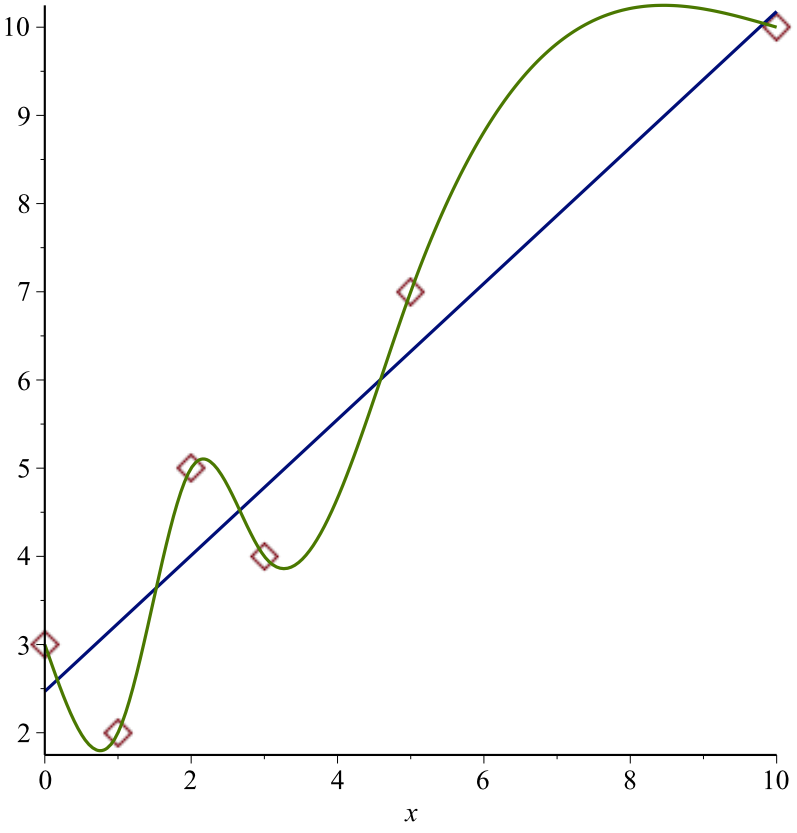
Change the question: data points are APPROXIMATE.

> *lynne* := *LeastSquares*(*data*, *x*) :

> *plot*([*data*, *lynne*], *x* = 0..10, *style* = [*point*, *line*, *line*], *symbolsize* = 25);




```
> plot([data, lynne, cracker], x = 0..10, style = [point, line, line], symbolsize = 25);
```




```
> D := (x, y) → x^2 + y^2;
```

Error, attempting to assign to `D` which is protected. Try declaring `local D`; see ?protect for details.

```
> D(sin);
```

$$\cos \tag{3}$$

```
> line := (x, m, b) → m·x + b;
```

$$line := (x, m, b) \rightarrow m\,x + b \tag{4}$$

```
> line(2, a, b);
```

$$2\,a + b \tag{5}$$

```
> pt := data[3];
```

$$pt := [2, 5] \tag{6}$$

```
> pt[2];
```

$$5 \tag{7}$$

```
> dp := (p, line) → p[2] − line(p[1], m, b);
```

$$dp := (p, line) \rightarrow p_2 - line(p_1, m, b) \tag{8}$$

```
> dp([2, 5], line);
```

$$5 - 2\,m - b \tag{9}$$

```
> dp([2, 5], x→3·x + 2);
```

$$-3 \tag{10}$$

dist from data to line is ∑ dp(data[i],line)^2

```
> d := (data, line) → sum( (dp(data[i], line))^2, i = 1 ..6 );
```

$$d := (data, line) \rightarrow \sum_{i=1}^{6} dp\left(data_i, line\right)^2 \tag{11}$$

```
> d(data, x→3·x + 2);
```

$$652 \tag{12}$$

```
> d([[1, 2], [3, 4]], x→3·x + 2);
```

Error, (in tools/add) invalid subscript selector

```
> d := (data, line) → sum( (dp(data[i], line))^2, i = 1 ..2);
```

$$d := (data, line) \rightarrow \sum_{i=1}^{2} dp\left(data_i, line\right)^2 \tag{13}$$

```
> d([[1, 2], [3, 4]], x→3·x + 2);
```

$$58 \tag{14}$$

```
> d(data, x→3·x + 2);
```

$$10 \tag{15}$$

```
> nops(data);
```

$$6 \tag{16}$$

```
> nops([[1, 2], [3, 4]]);
```

$$2 \tag{17}$$

```
> d := (data, line) → sum( (dp(data[i], line))^2, i = 1 ..nops(data) );
```

$$d := (data, line) \rightarrow \sum_{i=1}^{nops(data)} dp\left(data_i, line\right)^2 \tag{18}$$

```
> d(data, x→3·x + 2);
```

$$652 \tag{19}$$

```
> d([[1, 2], [3, 4]], x→3·x + 2);
```

$$58 \tag{20}$$

```
> d := (data, line) → sum( 1/nops(data) (dp(data[i], line))^2, i = 1 ..nops(data) );
```

$$d := (data, line) \rightarrow \sum_{i=1}^{nops(data)} \frac{dp\left(data_i, line\right)^2}{nops(data)} \tag{21}$$

```
> d([[1, 2], [3, 4]], x→3·x + 2);
```

$$29 \tag{22}$$

```
> d(data, x→3·x + 2);
```

$$\frac{326}{3} \tag{23}$$

```
> d(data, x→3·x + 2 + x^3);
```

$$\frac{1064003}{6} \tag{24}$$

```
> ldist := (m, b) →d(data, x→m·x + b)
```

$$ldist := (m, b) \rightarrow d(data, x \rightarrow m * x + b) \quad (25)$$

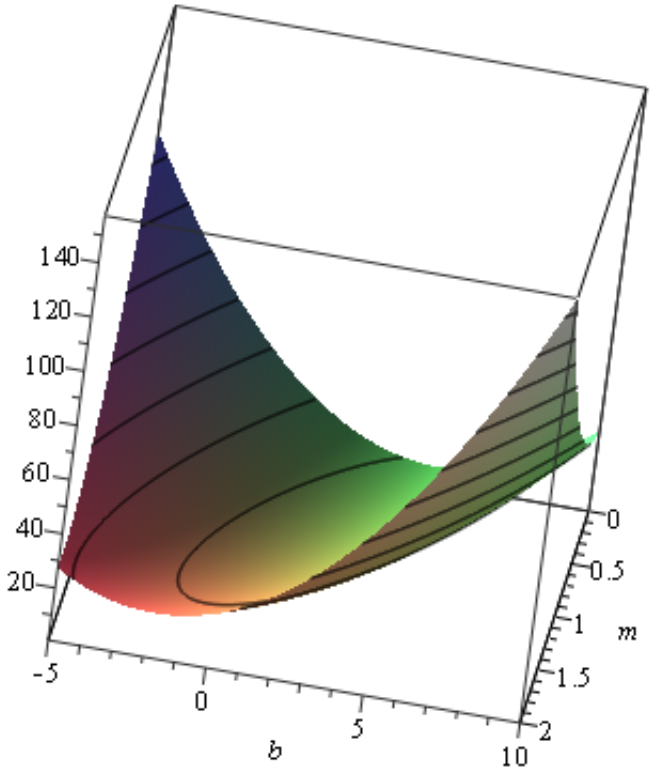
```
> ldist(2, 3);
```

$$\frac{81}{2} \quad (26)$$

```
> ldist(1, 7);
```

$$\frac{89}{3} \quad (27)$$

```
> plot3d(ldist(m, b), m = 0 ..2, b = -5 ..10, style = patchcontour);
```




```
>
```