```
> restart:
```

*We are trying to minimize least square deviation of data y from model a*x+b:*

```
> chi^2 = Sigma(a*x+b - y)^2;
```

$$\chi^2 = \Sigma(a\,x + b - y)^2 \tag{1}$$

This leads to to two equations: dchi^2/da = 0, which is a sum of the terms like:

```
> (a*x+b - y)^2: diff(%/2, a); collect(%, a): collect(%,b);
```

$$(a\,x + b - y)\,x$$

$$x^2\,a + x\,b - y\,x \tag{2}$$

And the second one dchi^2/db = 0, which is a sum of the terms like:

```
> (a*x+b - y)^2: diff(%/2, b); #collect(%, a): collect(%,b);
```

$$a\,x + b - y \tag{3}$$

*With notation Sigma[xx] = Sum(x*x) and so on, the linear equations that define best fit are:*

```
> Sigma[xx]*a + Sigma[x]*b = Sigma[xy]; Sigma[x]*a + n*b = Sigma[y];
```

$$\Sigma_{xx}\,a + \Sigma_x\,b = \Sigma_{xy}$$

$$\Sigma_x\,a + n\,b = \Sigma_y \tag{4}$$

and the solution is...

```
> solve([%,%%], [a,b]);
```

$$\left[\left[a = \frac{n\,\Sigma_{xy} - \Sigma_x\,\Sigma_y}{n\,\Sigma_{xx} - \Sigma_x^2},\ b = -\frac{\Sigma_x\,\Sigma_{xy} - \Sigma_{xx}\,\Sigma_y}{n\,\Sigma_{xx} - \Sigma_x^2}\right]\right] \tag{5}$$