```
?? Fit
```

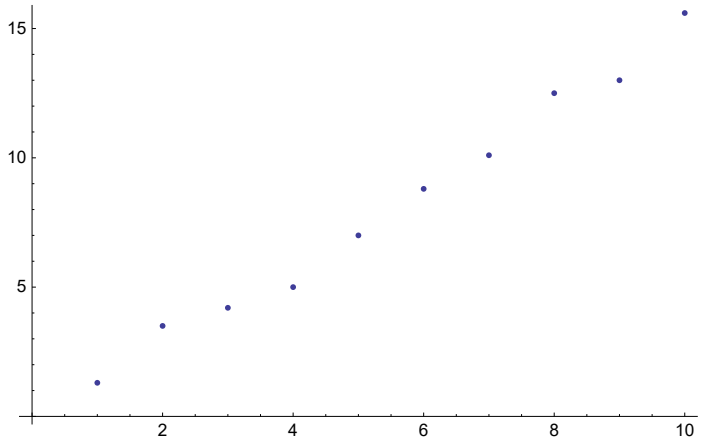
Fit[*data*, *funs*, *vars*] finds a least-squares fit to a list of data as a linear combination of the functions *funs* of variables *vars*. >>

```
Attributes[Fit] = {Protected}
```

Table 8.1

x_i	y_i	x_i	y_i
1	1.3	6	8.8
2	3.5	7	10.1
3	4.2	8	12.5
4	5.0	9	13.0
5	7.0	10	15.6

```
data = {{1, 1.3}, {2, 3.5}, {3, 4.2}, {4, 5},
   {5, 7}, {6, 8.8}, {7, 10.1}, {8, 12.5}, {9, 13}, {10, 15.6}};
f2 = ListPlot[data]
```



Find the line that best fits the data:

```
y = Fit[data, {1, x}, x]
```

$-0.36 + 1.53818\,x$

Find the quadratic that best fits the data:

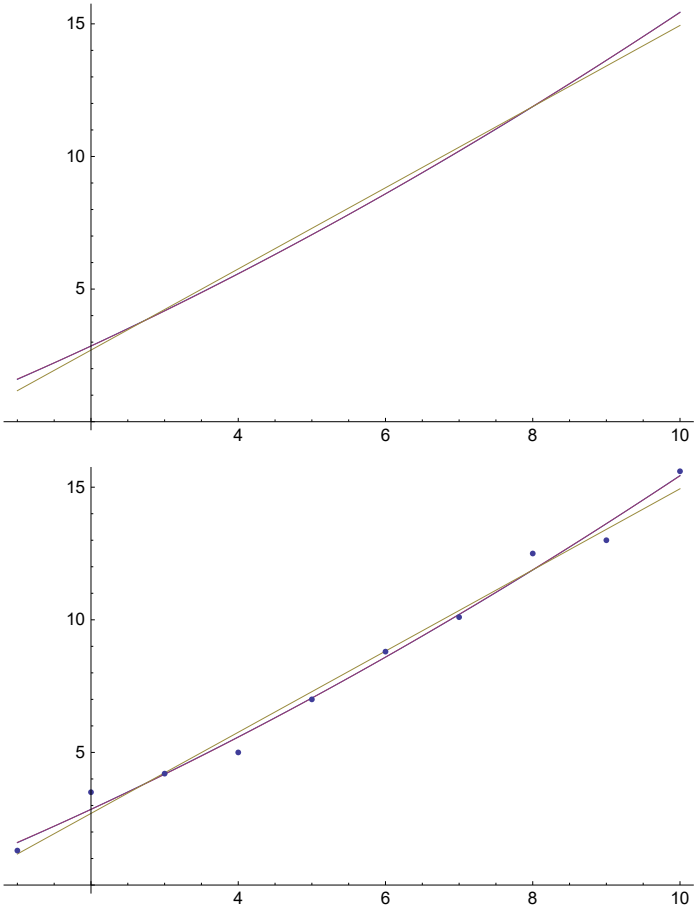
```
parabola = Fit[data, {1, x, x^2}, x]
y2 = Fit[data, {1, x, x^2, x^3}, x]
```

$0.406667 + 1.15485\,x + 0.0348485\,x^2$

$0.45 + 1.11641\,x + 0.0431818\,x^2 - 0.000505051\,x^3$

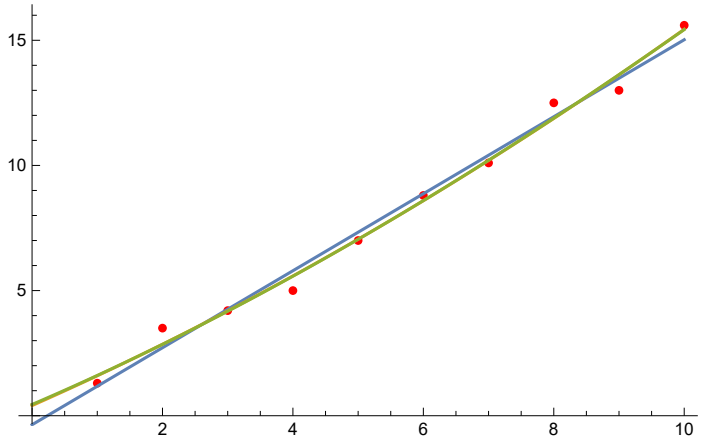
```
y1 = 0.4066666666666671` + 1.1548484848484837` x + 0.034848484848484886` x^2;
y0 = 1.53 x - 0.36
y2 = 0.44999999999999835` + 1.116414141414142` x +
  0.043181818181817884` x^2 - 0.0005050505050504863` x^3

f1 = Plot[{y1, y2, y0}, {x, 1, 10}]
Show[f1, f2]
```



Show the data with the two curves:

```
Show[ListPlot[data, PlotStyle → Red], Plot[{y, parabola, y2}, {x, 0, 10}]]
```

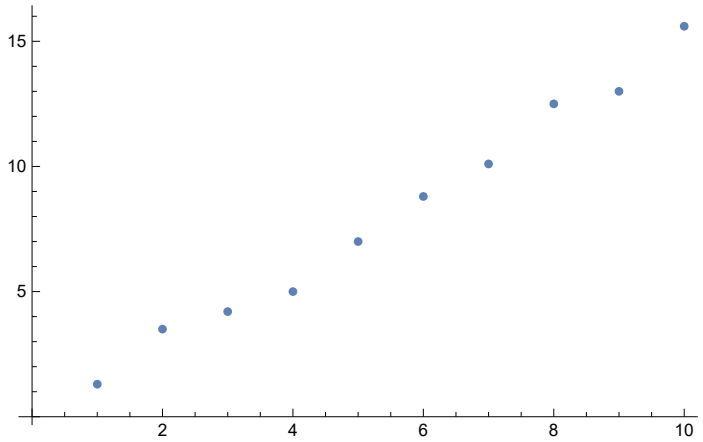


Homwork Example 8 – 2 + steps of examples

Table 8.3

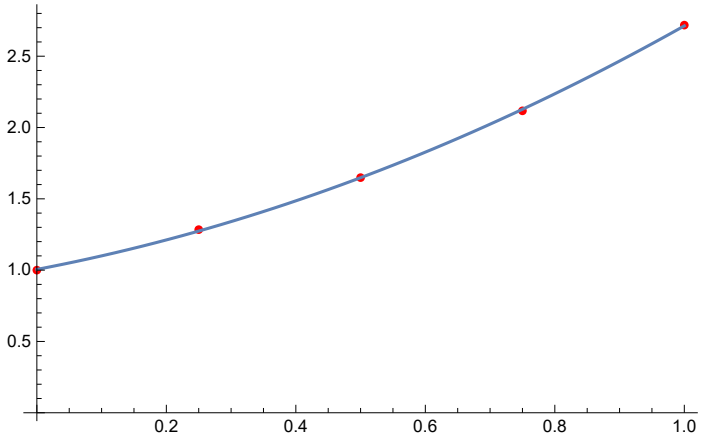
i	x_i	y_i
1	0	1.0000
2	0.25	1.2840
3	0.50	1.6487
4	0.75	2.1170
5	1.00	2.7183

```
data1 = {{0, 1.}, {0.25, 1.284}, {0.5, 1.6487}, {0.75, 2.117}, {1, 2.718}};
ListPlot[data]
a1 = Fit[data1, {1, x, x^2}, x]
```



$1.00511 + 0.864629\,x + 0.842971\,x^2$

```
Show[ListPlot[data1, PlotStyle → Red], Plot[{a1}, {x, 0, 1}]]
```




```
?? Solve
```

Solve[*expr*, *vars*] attempts to solve the system *expr* of equations or inequalities for the variables *vars*.

Solve[*expr*, *vars*, *dom*] solves over the domain *dom*. Common choices of *dom* are Reals, Integers, and Complexes. ≫

```
Attributes[Solve] = {Protected}
```

```
Options[Solve] =
  {Cubics → True, GeneratedParameters → C, InverseFunctions → Automatic, MaxExtraConditions → 0,
   Method → Automatic, Modulus → 0, Quartics → True, VerifySolutions → Automatic, WorkingPrecision → ∞}
```

```
N[Solve[{x + 2 y + z == 7, 3 x - 5 y - 4 z == 4, 5 x + 3 y + 2 z == 5}, {x, y, z}]]
```

```
{{x → 0.3125, y → 9.9375, z → -13.1875}}
```

```
Solve[{a x + y == 7, b x - y == 1}, {x, y}]
```