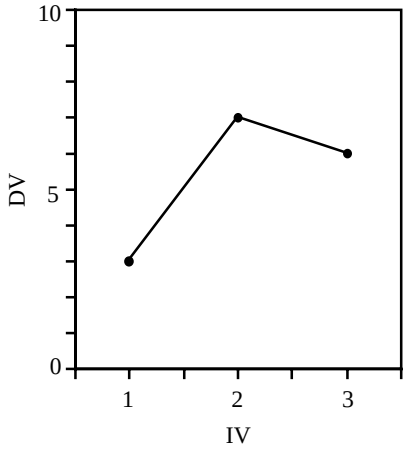
Example of fitting 3 points with polynomial of 2nd degree

| | 1 | 2 | 3 |
|---|---|---|---|
| $\bar{Y}_{Aj}$ DV | 3 | 7 | 6 |




$DV = a + bx + cx^2$

We have 3 eq. in 3 unknowns

$3 = a + b(1) + c(1)$ Eq 1

$7 = a + b(2) + c(4)$ Eq. 2

$6 = a + b(3) + c(9)$ Eq. 3

Subtract Eq. 1 from Eq. 3

$6 = a + 3b + 9c$

$3 = 1 + b + c$

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$3 = 2b + 8c$

$2b = 3 - 8c$

$b = 3/2 - 4c$

Subtract 2 x Eq. 1 from Eq. 2

$7 = a + 2b + 4c$

$6 = 2a + 2b + 2c$

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$1 = -a + 0 + 2c$

$a = 2c - 1$

Subst. into Eq. 1: solve for c

$3 = (2c - 1) + (3/2 - 4c) + c$

$3 = 2c - 1 + 1.5 - 4c + c = 1/2 - c$

$3 = 1/2 - c$ $c = 1/2 - 3$ $c = -2.5$

Solve for b:

$b = 3/2 - 4(-5/2) = 3/2 + 10 = 11.5$

Solve for a:

$a = 2(-5/2) - 1$

$a = -6$

So: $DV = -6 + 11.5X + (-2.5)X^2$

Then check calculations:

Let X = 1

DV = -6 + 11.5 - 2.5 = 3

Let X = 2

DV = -6 + 11.5(2) - (2.5)(4)

= -6 + 23 - 10 = 7

Let X = 3

DV = -6 + 11.5(3) - (2.5)(9)

= -6 + 34.5 - 22.5 = 6