



## Coeficientes para el método de Adams-Bashforth-Moulton

### Fórmula predictora

$$(y_{i+1})^p = y_i + \frac{h}{den_n} \sum_{j=0}^n b_{-j,n} f(t_{i-j}, y_{i-j})$$

Con los siguientes coeficientes

| $n$ | $b_{0,n}$ | $b_{-1,n}$ | $b_{-2,n}$ | $b_{-3,n}$ | $b_{-4,n}$ | $b_{-5,n}$ | $b_{-6,n}$ | $den_n$ |
|-----|-----------|------------|------------|------------|------------|------------|------------|---------|
| 1   | 3         | -1         |            |            |            |            |            | 2       |
| 2   | 23        | -16        | 5          |            |            |            |            | 15      |
| 3   | 55        | -59        | 37         | -9         |            |            |            | 24      |
| 4   | 1901      | -2774      | 2616       | -1274      | 251        |            |            | 720     |
| 5   | 4277      | -7923      | 9982       | -7298      | 2877       | -475       |            | 1440    |
| 6   | 198721    | -447288    | 705549     | -688256    | 407139     | -134472    | 19087      | 60480   |

Donde  $n$  es el orden del polinomio de interpolación utilizado para desarrollar la fórmula. Por ejemplo, la fórmula de AB4 se obtiene a partir de un polinomio cúbico,  $n=3$ :

$$(y_{i+1})^p = y_i + \frac{h}{24} [55f(t_i, y_i) - 59f(t_{i-1}, y_{i-1}) + 37f(t_{i-2}, y_{i-2}) - 9f(t_{i-3}, y_{i-3})]$$

### Fórmula correctora

$$(y_{i+1})^c = y_i + \frac{h}{den_n} \sum_{j=1}^{n-1} b_{-j,n} f(t_{i-j}, y_{i-j})$$

Con los siguientes coeficientes

| $n$ | $B_{1,n}$ | $B_{0,n}$ | $b_{-1,n}$ | $b_{-2,n}$ | $b_{-3,n}$ | $b_{-4,n}$ | $b_{-5,n}$ | $den_n$ |
|-----|-----------|-----------|------------|------------|------------|------------|------------|---------|
| 1   | 1         | 1         |            |            |            |            |            | 2       |
| 2   | 5         | 8         | -1         |            |            |            |            | 15      |
| 3   | 9         | 19        | -5         | 1          |            |            |            | 24      |
| 4   | 251       | 646       | -264       | 106        | -19        |            |            | 720     |
| 5   | 475       | 1427      | -798       | 482        | -173       | 27         |            | 1440    |
| 6   | 19087     | 65112     | -46461     | 37504      | -20211     | 6312       | -863       | 60480   |

Para  $n=3$  obtenemos la fórmula correctora de Adams-Moulton de 4to orden:

$$(y_{i+1})^c = y_i + \frac{h}{24} [9f(t_{i+1}, y_{i+1}) + 19f(t_i, y_i) - 5f(t_{i-1}, y_{i-1}) + f(t_{i-2}, y_{i-2})]$$