# CJ - Numerical methods

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| *All of this is in the formula book.* | |
| **What is an ordinate? (with example)** | * A y-value. * The following has 4 ordinates (y-values) starting from y0 to y3. |
| **How does the mid-ordinate rule work?** | This comes from the formula: |
| **How is Simpson’s Rule better than the Midordatine rule?** | By minimising the differences at the top and bottom of each rectangle by replacing the mid ordinates with a quadratic curve. |
| **How does Simpson’s rule work?** | *This means you require 5 ordinates.* |
| **When is Euler’s Method usually used? How does it work geometrically? What should you note?** | * To solve nonlinear differential equations (eg, dy/dx = x2 + y2).      * As shown, reducing step size increases accuracy. |
| **When will Euler’s Method be an underestimate or an overestimate?** | Underestimate when convex:    Underestimate when concave: |