

10 Questions

for *Numerical Programming 1 (CSE)*

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1. The relative rounding error is smaller or equal to half the machine epsilon ε_M – does this mean $|x - \text{fl}(x)| \leq \frac{1}{2}\varepsilon_M|x|$ for $x \in \mathbb{R}$?
2. Condition numbers tell how much algorithms amplify rounding errors – is this correct?
3. The condition of a matrix A measures how perturbations of the right hand side b affect the solution x of the linear system $Ax = b$ in the best – is this correct?
4. Backward stable algorithms provide the exact solution for nearly the right problem – is this correct?
5. Newton's method may be used for solving a fixed point problem $f(x) = x$ – is this correct?
6. Aitken's method requires the first derivative for solving a fixed point problem $\phi(x) = x$ – is this correct?
7. Given x_0, \dots, x_n equally spaced points and y_0, \dots, y_n with n rather large – is polynomial interpolation the method of choice?
8. The FFT computes the coefficients for trigonometric interpolation on n data points – does this requires $O(n^2)$ arithmetic operations?
9. An interpolating cubic spline is three times continuously differentiable – is this correct?
10. Quadrature rules with negative weights may be better conditioned than the corresponding integral – is this correct?