		"COST"	CONVERGENCE $\lim_{k\to 0} \frac{\|e_{k+1}\|}{\|e_k\|^r} = C$
Bisection 1D	check signs $f(a), f(b)$ $\Delta t_{k+1} = \frac{\Delta t_k}{2}$ $\Delta t_k = \frac{\Delta t_0}{2^k}$	1 function eval per iteration (no need for derivatives)	$r = 1$, $C = 0.5$ linear
Newton 1D	$x_{k+1} = x_k + h$ $h = -f(x_k)/f'(x_k)$	2 fc eval per iteration need $f(x)$ and $f'(x)$	• quadratic (close to root) • depends on initial guess (not guaranteed to converge)
Newton 2D	$\underset{\sim}{x}_k = \underset{\sim}{x}_k + \underset{\sim}{s}$ $\underset{\approx}{J}(x_k)\,\underset{\sim}{s} = -\underset{\sim}{f}(\underset{\sim}{x}_k)$	One solve $(O(n^3))$ per iteration! To obtain $J(x)$ for dense matrix $\Rightarrow n^2$ evaluations	$r = 2$, $c < 1$ (close to root!)
Secant 1D	$x_{k+1} = x_k + h$ $h = -f(x_k)/\tilde{df}(x_k)$ $\tilde{df} = \frac{f(x_k) - f(x_{k-1})}{x_k - x_{k-1}}$	1 fc eval per iteration needs two initial guesses no need to know $f'(x)$	• superlinear $1 < r < 2$ • local convergence (depends on initial guess) $r = 1.618$