Summary of Numerical Methods

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Roots and Optimization	Roots: Solve for x so that $f(x) = 0$ Optimization: Solve for x so that $f(x) = 0$
Linear Algebraic Equations	Given values of a and b, solve for x. $a_{11}x_1 + a_{12}x_1 = b_1$ $a_{21}x_1 + a_{22}x_2 = b_2$
Curve Fitting	Regression is used where these is a significant degree of error Interpolation is used where there are relatively error-free data points.
Integration and Differentiation	Integration: Find the area under the curve Differentiation: Find the slope of the curve
Differential Equations	Given $\frac{dy}{dt} \approx \frac{\Delta y}{\Delta t} = f(t, y)$ Solve for y as a function of t $y_{i+1} = y_i + f(t_i, y_i)\Delta t$