2411 Project 5

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1 Analytical Solution and Numerical Method

The solution to the Poisson equation for the gravitational potential with boundary conditions of a uniform charge density sphere of radius R is

$$V(r) = \begin{cases} \frac{1}{6}(r^2 - 3R^2), & r \leq R \\ -\frac{1}{3}\frac{R^3}{r}, & r > R \end{cases}$$

2 Library Description

The inputs to the `rmatrixlu` function are: the matrix to be decomposed, its number of rows, and its number of columns. The dimension of the input matrix is $m \times n$ for arbitrary $m, n \in \mathbf{R}$. The `rmatrixlusolve`