Intro

This report is going to look in to

1

a

Poisson's equation:

$$\nabla^2\Phi = -4\pi\rho(r) \tag{1}$$

Which becomes in one dimension with symmetric Φ

$$\frac{1}{r^2}\frac{d}{dr}(r^2\frac{d\Phi}{dr}) = -4\pi\rho(r) \tag{2}$$

Starting by looking at the relation $\mathbf{Av} = \tilde{\mathbf{b}}$

Where $\mathbf{A} =$

$$\begin{bmatrix} 2 & -1 & 0 & \dots & \dots & 0 \\ -1 & 2 & -1 & 0 & \dots & \vdots \\ 0 & -1 & 2 & -1 & 0 & \vdots \\ \vdots & \vdots & \ddots & \ddots & \ddots & \vdots \\ \vdots & \dots & \dots & -1 & 2 & -1 \\ 0 & \dots & \dots & 0 & -1 & 2 \end{bmatrix}$$

and $\mathbf{v} =$

$$\begin{bmatrix} v_1 \\ v_2 \\ v_3 \\ \dots \\ v_{n-1} \\ v_n \end{bmatrix}$$

Discussion