POTENCJAŁ ELEKTRYCZNY

$$\frac{d^2\varphi}{dx^2} = -\frac{\rho}{\varepsilon_r}$$

Warunki brzegowe: $\varphi'(0) + \varphi(0) = 5$

$\varphi(3) = 2$

$\rho = 1$

$$\varepsilon_r = \begin{cases} 10 & \text{dla } x \in [0,1] \\ 5 & \text{dla } x \in (1,2] \\ 1 & \text{dla } x \in (2,3] \end{cases}$$

Wyprowadzenie sformułowania wariacyjnego:

$$\int_0^3 \varphi''(x) v(x)\,dx = -\int_0^3 \frac{\rho}{\varepsilon_r} v(x)\,dx$$

$$v(3)\varphi'(3) - v(0)\varphi'(0) - \int_0^3 \varphi'(x)v(x)\,dx = -\int_0^3 \frac{\rho}{\varepsilon_r} v(x)\,dx$$

$v(3) = 0 \qquad \varphi'(0) = 5 - \varphi(0)$

$$-v(0)(5-\varphi(0)) - \int_0^3 \varphi'(x)v(x)\,dx = -\int_0^3 \frac{\rho}{\varepsilon_r} v(x)\,dx$$

$$v(0)\varphi(0) - \int_0^3 \varphi'(x)v(x)\,dx = 5v(0) - \int_0^3 \frac{\rho}{\varepsilon_r} v(x)\,dx$$

$$B(\varphi, v) = L(v)$$

$\varphi = w + \tilde{\varphi}$

$\tilde{\varphi} = \varphi - w$

$\tilde{\varphi}(3) = 2$

$\tilde{\varphi} = 2e_n$

$$B(\tilde{\varphi} + w, v) = L(v)$$

$$B(w, v) = L(v) - B(\tilde{\varphi}, v)$$

$$B(w, v) = L(v) - 2B(e_n, v)$$

$$B(w, v) = \tilde{L}(v)$$