

$$-k(x) \frac{d^2 u(x)}{dx^2} = 0$$

$$u(2) = 0$$

$$\frac{du(0)}{dx} + u(0) = 20$$

$$k(x) = \begin{cases} 1 & \text{dla } x \in [0, 1] \\ 2 & \text{dla } x \in (1, 2] \end{cases}$$

$$[0, 2] \ni x \rightarrow u(x) \in \mathbb{R}$$

$$k(x) \frac{d^2 u(x)}{dx^2} = 0 \quad / : -k(x)$$

$$u'' = 0 \quad / \int_0^2 v$$

$$\int_0^2 u'' v = 0$$

$$\int_0^2 u'' v = \left| \begin{matrix} v & v' \\ u'' & u' \end{matrix} \right| = v u' \Big|_0^2 - \int_0^2 v' u' dx$$

$$v(2)u'(2) - v(0)u'(0) - \int_0^2 v' u' dx = 0$$

$$u(2) = 0 \Rightarrow u'(2) = 0$$

$$u'(0) + u(0) = 20 \Rightarrow u'(0) = 20 - u(0)$$

$$-v(0)(20 - u(0)) - \int_0^2 v' u' dx = 0$$

$$u(0)v(0) - \int_0^2 v' u' dx = 20v(0)$$

$$u(0)v(0) - \int_0^2 v' u' dx = 20v(0)$$

$$B(u, v)$$

$$L(v)$$