

DIFERENCNI POSTUPAK

-pravougaone ploce-

$$DJ: \frac{d^4 w}{dx^4} + 2 \frac{d^4 w}{dx^2 dy^2} + \frac{d^4 w}{dy^4} = \frac{z(x, y)}{K}$$

$$\left(\frac{dw}{dx} \right)_k \approx \frac{w_{k+1} - w_{k-1}}{2Sx}$$

$$\left(\frac{d^2 w}{dx^2} \right)_k \approx \frac{w_{k+1} - 2w_k + w_{k-1}}{Sx^2}$$

$$\left(\frac{d^3 w}{dx^3} \right)_k \approx \frac{w_{k+2} - 2w_{k+1} + 2w_{k-1} - w_{k-2}}{2Sx^3}$$

$$\left(\frac{d^4 w}{dx^4} \right)_k \approx \frac{w_{k+2} - 4w_{k+1} + 6w_k - 4w_{k-1} + w_{k-2}}{Sx^4}$$

$$\left(\frac{dw}{dy} \right)_k \approx \frac{w_l - w_i}{2Sy}$$

$$\left(\frac{d^2 w}{dy^2} \right)_k \approx \frac{w_l - 2w_k + w_i}{Sy^2}$$

$$\left(\frac{d^3 w}{dy^3} \right)_k \approx \frac{w_m - 2w_l + 2w_i - w_h}{2Sy^3}$$

$$\left(\frac{d^4 w}{dy^4} \right)_k \approx \frac{w_m - 4w_l + 6w_k - 4w_i + w_h}{Sy^4}$$

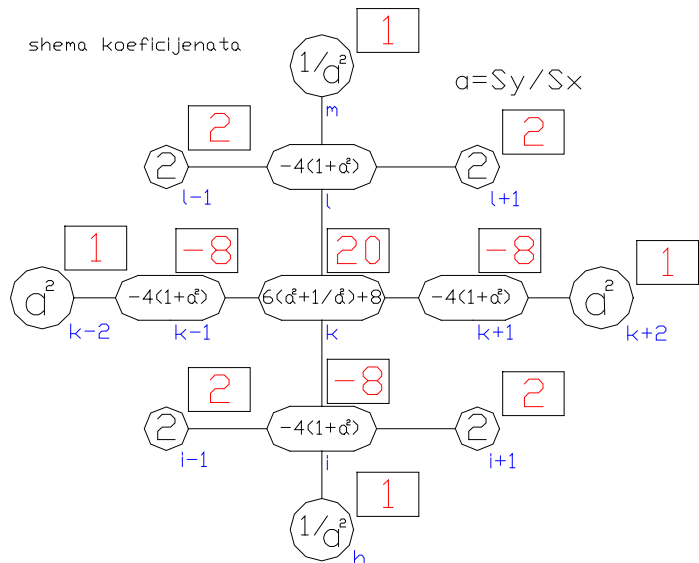
$$\left(\frac{d^2 w}{dx dy} \right)_k \approx \frac{w_{l+1} - w_{l-1} - w_{i+1} + w_{i-1}}{4SxSy}$$

$$\left(\frac{d^3 w}{dx^2 dy} \right)_k \approx \frac{w_{l+1} - 2w_l + w_{l-1} - w_{i+1} + 2w_i + w_{i-1}}{2Sx^2 Sy}$$

$$\left(\frac{d^3 w}{dx dy^2} \right)_k \approx \frac{w_{l+1} - 2w_{k+1} + w_{i+1} - w_{l-1} + 2w_{k-1} - w_{i-1}}{2Sy^2 Sx}$$

$$\left(\frac{d^4 w}{dx^2 dy^2} \right)_k \approx \frac{4w_k - 2(w_l + w_i + w_{k+1} + w_{k-1}) + w_{l+1} + w_{l-1} + w_{i+1} + w_{i-1}}{Sx^2 Sy^2}$$

shema koeficijenata



granicni uslovi

-slobodno oslonjena ivica

$$w_{k+2} = -w_k$$

-ukljestenje

$$w_{k+2} = w_k$$

-slobodna ivica

$$M_y, k = 0 \dots (1)$$

$$\overline{T}_y, k = 0 \dots (2)$$

$$(1) \Rightarrow W_l = 2W_k - W_i - ua^2(W_{k+1} + 2W_k + W_{k-1})$$

$$(2) \Rightarrow W_m = W_h + [2 + 2a^2(2-u)](W_l - W_i) + a^2(2-u)(W_{i+1} + W_{i-1} + W_{l+1} + W_{l-1})$$

-kružna ploča-

$$I_m = \frac{s}{r_m}$$

-u svakoj tacki ploce u kojoj nam je nepoznat ugib pisemo

DJ:

$$(1 + I_m)W_{m+2} - \left[2(2 + I_m) + \frac{I_m^2}{2}(2 - I_m) \right] \cdot w_{m+1} + \left(6 + 2I_m^2 + \frac{c}{K} s^4 \right) w_m - \\ - \left[2(2 - I_m) + \frac{I_m^2}{2}(2 + I_m) \right] w_{m-1} + (1 - I_m) \cdot w_{m-2} = \frac{Zms^4}{K}$$

Zm-vrednost povrinskog opterecenja u tacki m.

- za r=0:

$$\frac{16}{3}w_2 - \frac{64}{3}w_1 + \left(16 + \frac{c}{K} \cdot s^4 \right) \cdot w_0 = \frac{Z_0 s^4}{K}$$

PRESECNE SILE

$$Mr, m = -\frac{K}{S^2} \left[w_{m+1} \left(1 + \frac{ul_m}{2} \right) - 2w_m + w_{m-1} \left(1 - \frac{ul_m}{2} \right) \right]$$

$$Mj, m = -\frac{K}{S^2} \left[w_{m+1} \left(u + \frac{I_m}{2} \right) - 2uw_m + w_{m-1} \left(1 - \frac{I_m}{2} \right) \right]$$

$$Tr, m = -\frac{K}{2S^3} \left[w_{m+2} - w_{m+1} (2 - 2I_m + I_m^2) - 4I_m w_m + w_{m-1} (2 - 2I_m + I_m^2) - w_{m-2} \right]$$

slobodna ivica

