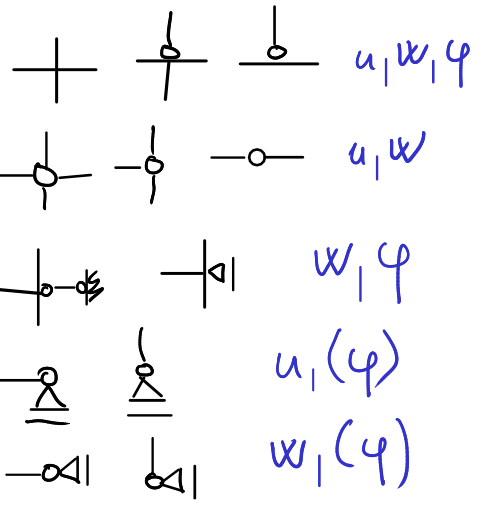
OBECNÁ DEFORMAČNÍ METODA (ODM)

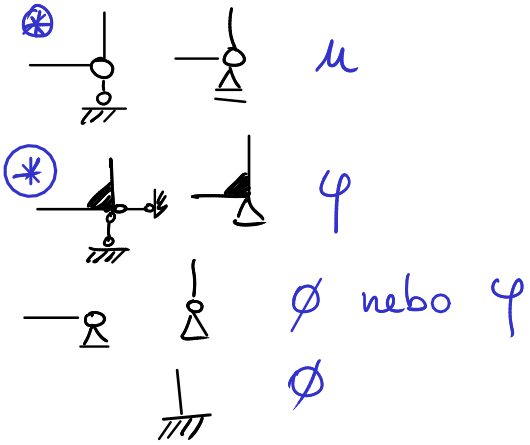
Stupeň přetvárné neurčitosti

- počet neznámých deformací



ZKRÁCENÁ VARIANTA

(tab. 10.1, str. 232)



$$n_p = 3t + 2k + p - p_w$$

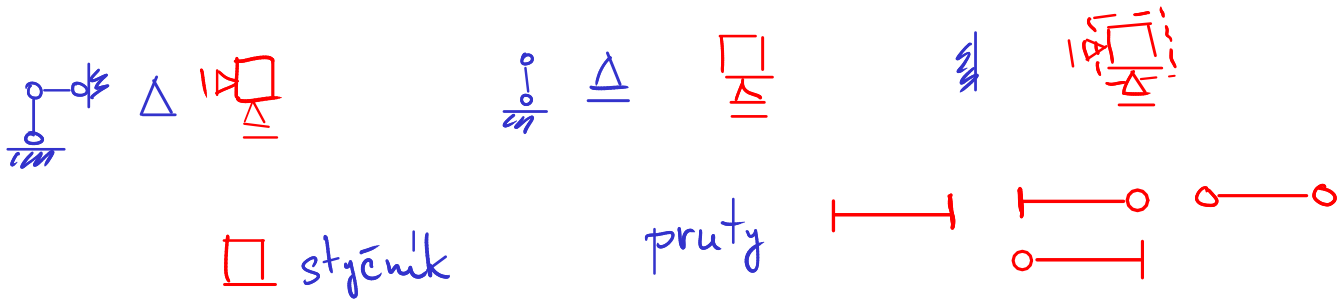
t ... počet monolických (tuhých) styčníků

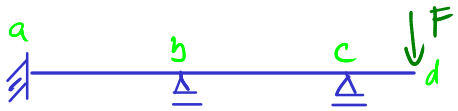
k ... počet kloubových styčníků

p ... počet jednoduchých posuvných podepření

p_w ... počet vnějších vazeb umístěných u styčníků a přepočtených na jednonásobné vazby

- pro zjednodušení ručních výpočtů budeme určovat **minimální stupeň přetvárné neurčitosti**
- místo vzorečku je lepší určit $n_{p,min}$ na základě výpočtového modelu



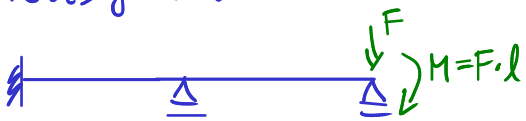


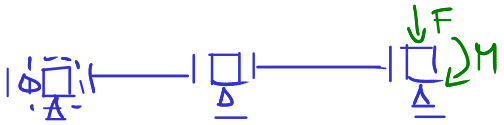
1) 

$n_p = 4$

$u_a = 0$	$u_b = ?$	$u_c = ?$	$u_d = ?$
$w_a = 0$	$w_b = 0$	$w_c = 0$	$w_d = ?$
$\varphi_a = 0$	$\varphi_b = ?$	$\varphi_c = ?$	$\varphi_d = ?$

2) převislý konec – můžeme odstranit a nahradit interakcemi

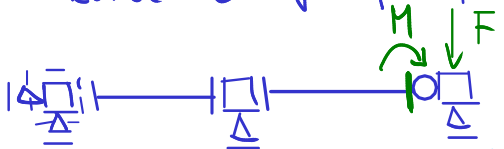




$n_p = 4$

$u = 0$	$u = ?$	$u = ?$
$w = 0$	$w = 0$	$w = 0$
$\varphi = 0$	$\varphi = ?$	$\varphi = ?$

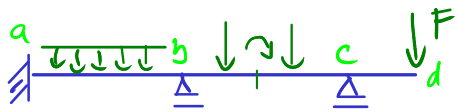
– konec "c" je podepřem Δ



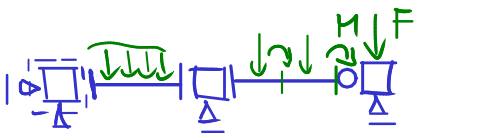
$n_p = 3$

$u = 0$	$u = ?$	$u = ?$
$w = 0$	$w = 0$	$w = 0$
$\varphi = 0$	$\varphi = ?$	$\varphi = 0$

3) s ohledem na zatížení

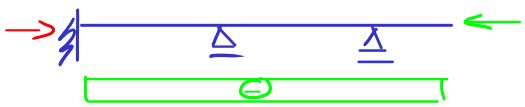


pouze příčné zatížení => nedochází k vodorovnému posunu u_c | u_b

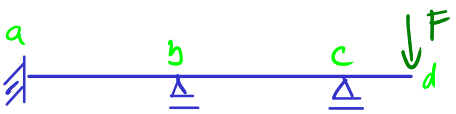


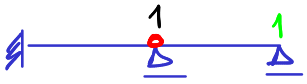
$n_p = 1$

$u = 0$	$u = 0$	$u = 0$
$w = 0$	$w = 0$	$w = 0$
$\varphi = 0$	$\varphi = ?$	$\varphi = 0$



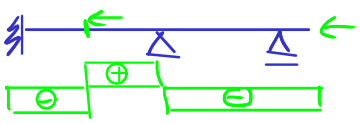
4) vzoreček

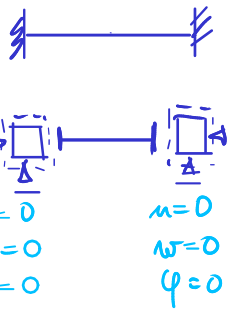




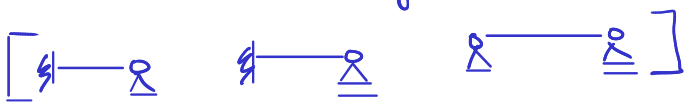
$n_p = 3 \cdot 1 + 2 \cdot 0 + 1 - 1 = 3$

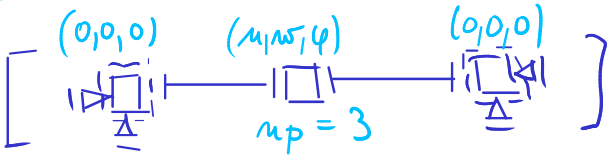
pozn. $n_s = 2x$

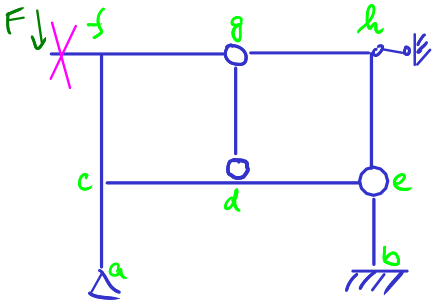




- jedná se přímo o základní typ prutu ⟼
⇒ stačí použít vektory pro daný typ (tabulky)

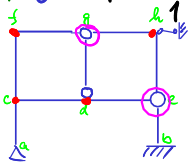


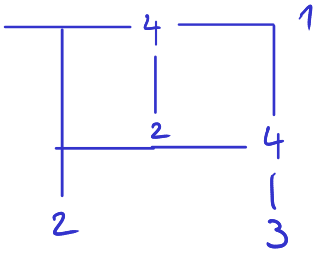




(*) převislý konec odstraníme a účinky přesuneme do (f)

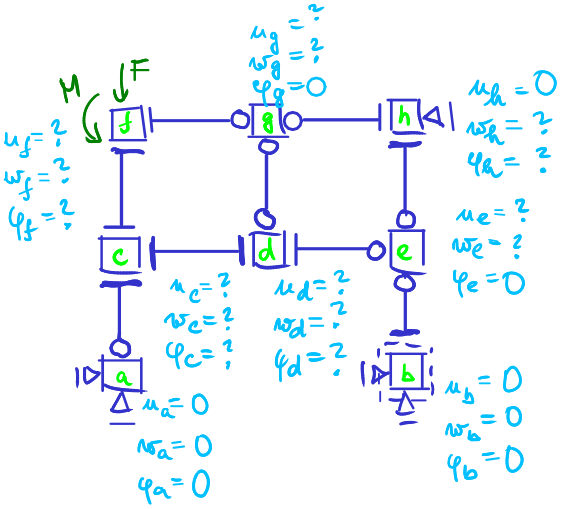
$(n_p = 3 \cdot 4 + 2 \cdot 2 + 0 - 1 = 15)$

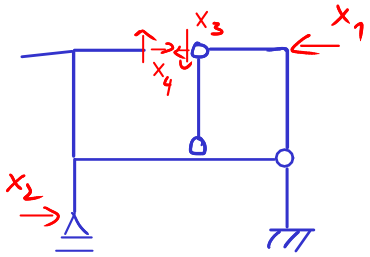


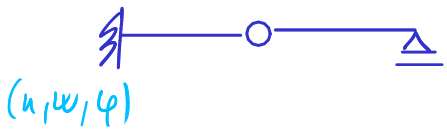


$n_p = 15$

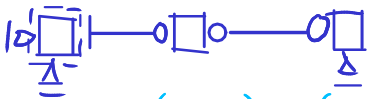
$n_s = 16 - 3 \cdot 4 = 4$





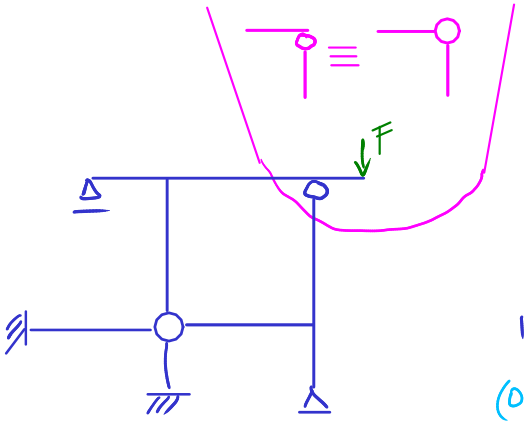


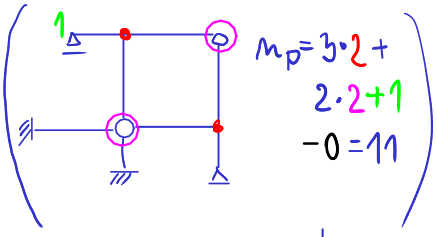
(u, w, φ)

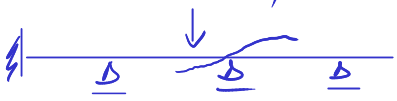


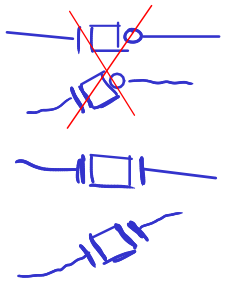
$(0,0,0)$ $(?,?,0)$ $(?,0,0)$ $n_p = 3$

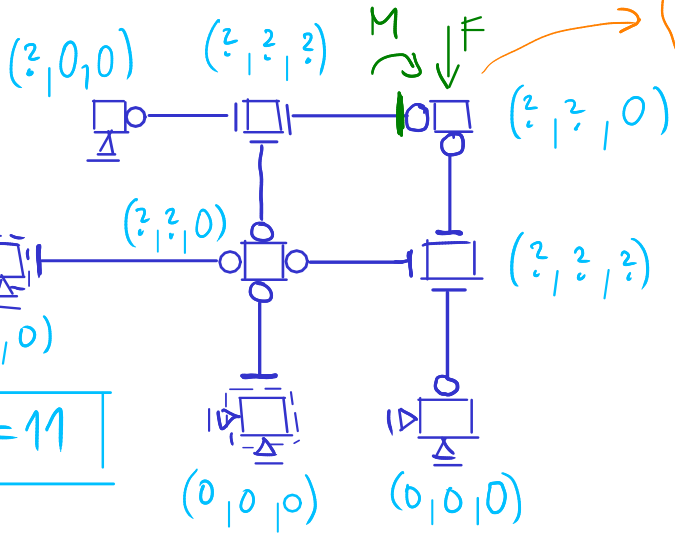
$0,?,0$ $0,0,0$ $n_p = 1$



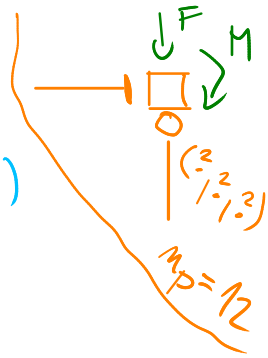


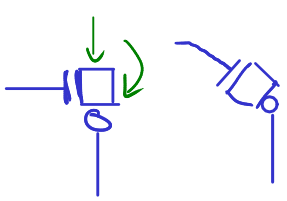


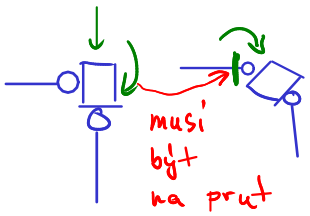


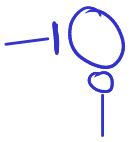


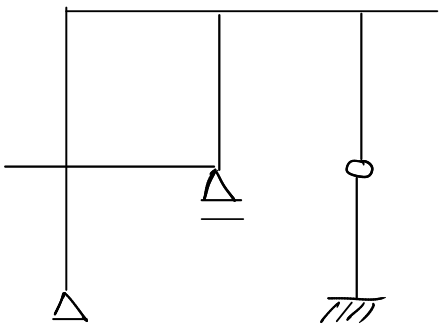
$n_p = 11$

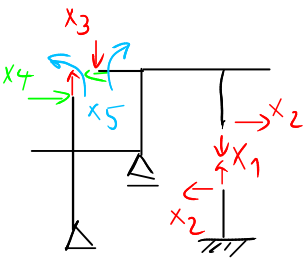






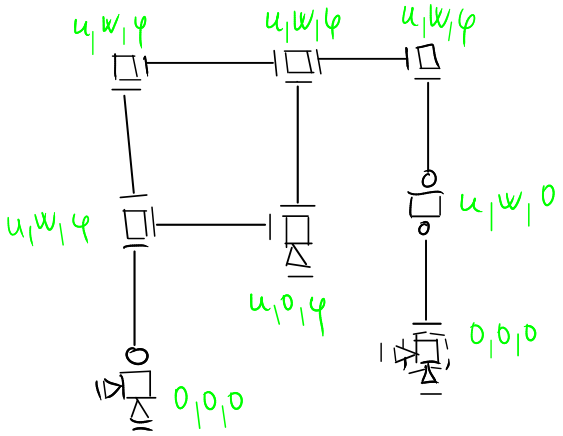






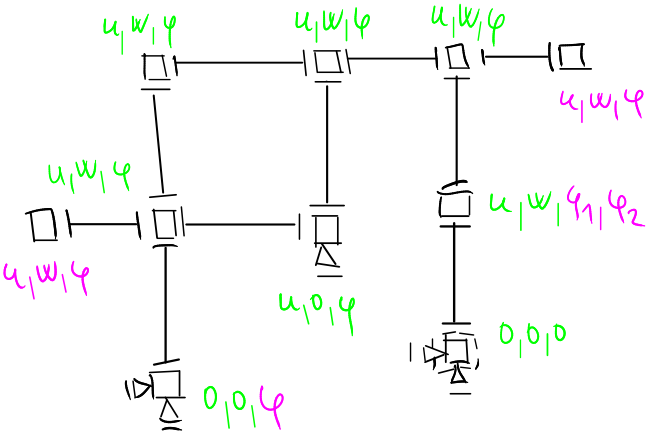
$n_s = 5$

ZKRÁCENÁ



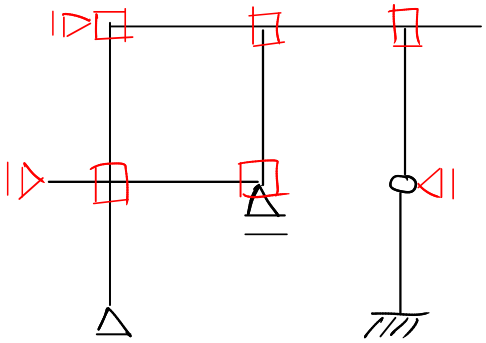
$n_p = 16$

NEZKRÁCENÁ



$n_n = 25$

ZJEDNODUŠENÁ



$n_{p,z} = 5+3 = 8$

model, který bude mít $n_p = 20$