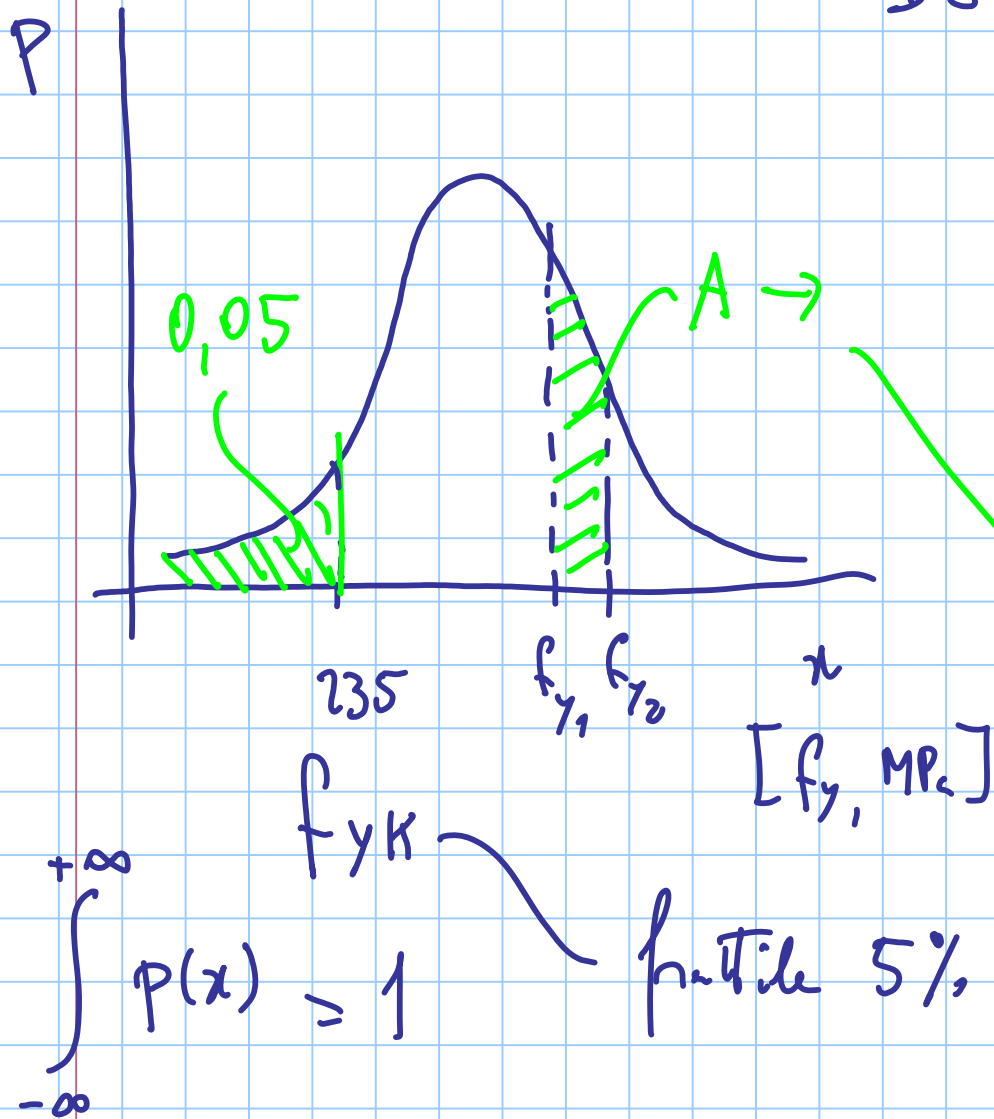


jpg

300 x 300



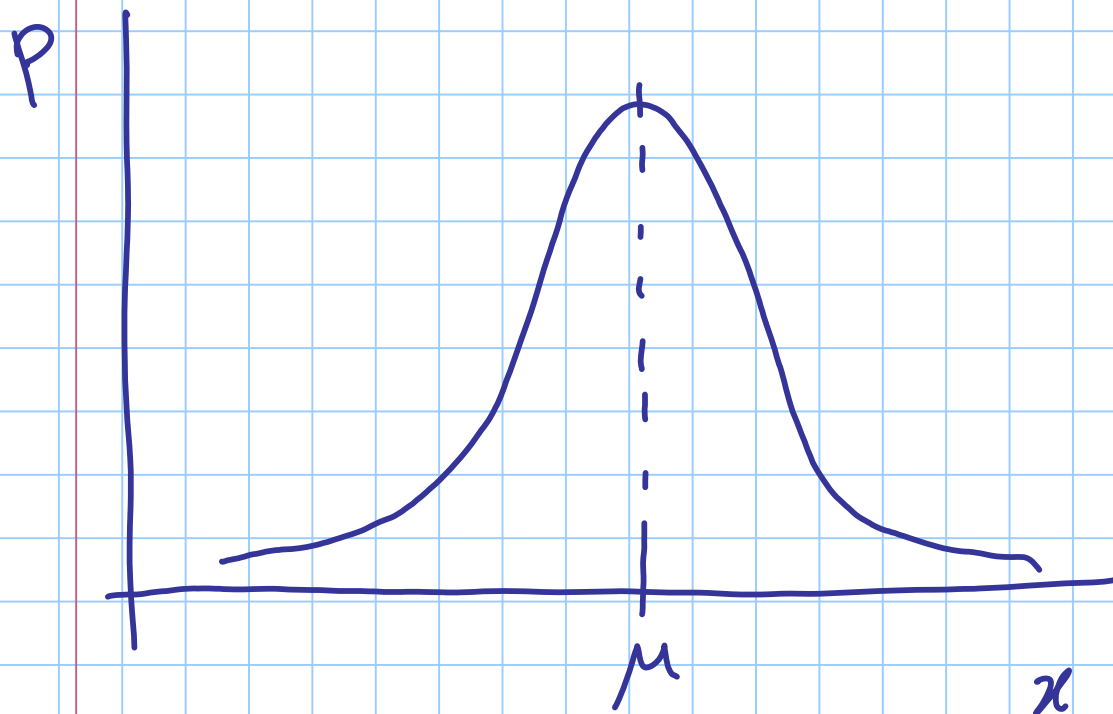
DENSITA' DI PROBABILITA'

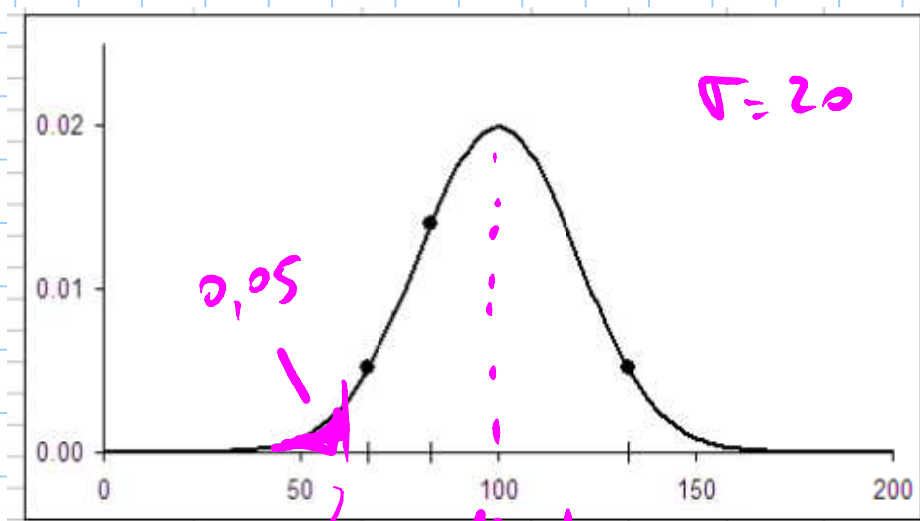


$$p(x) = \frac{e^{-\frac{1}{2} \left(\frac{x - \mu}{\sigma} \right)^2}}{\sqrt{2\pi} \sigma}$$

$A \rightarrow$ probability h

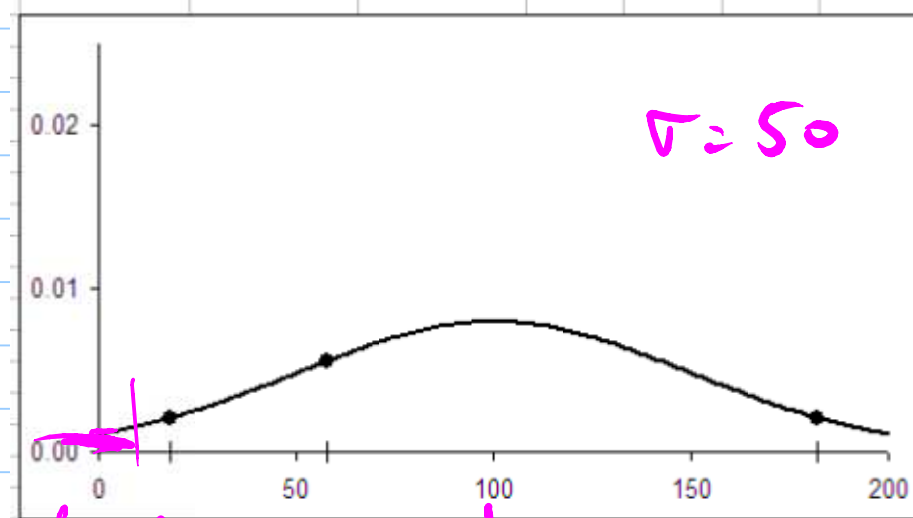
where $f_{y_1} \leq f_y \leq f_{y_2}$





h.t. 5%

1.65 σ



h.t. 5%

$\mu = 100$

resistente f_y

f_{yk}

valore caratteristico
fettile 5%

carichi
permanenti g

g_k

valore caratteristico
fettile 95%

carichi
variabili q

q_k

valore caratteristico
fettile 95%.

dei massimi in n anni
($n = 50$)

abitazioni

$$q_k = 2.0 \text{ KN/m}^2$$

scale

$$q_k = 4.0 \text{ KN/m}^2$$

coperture
non praticabili

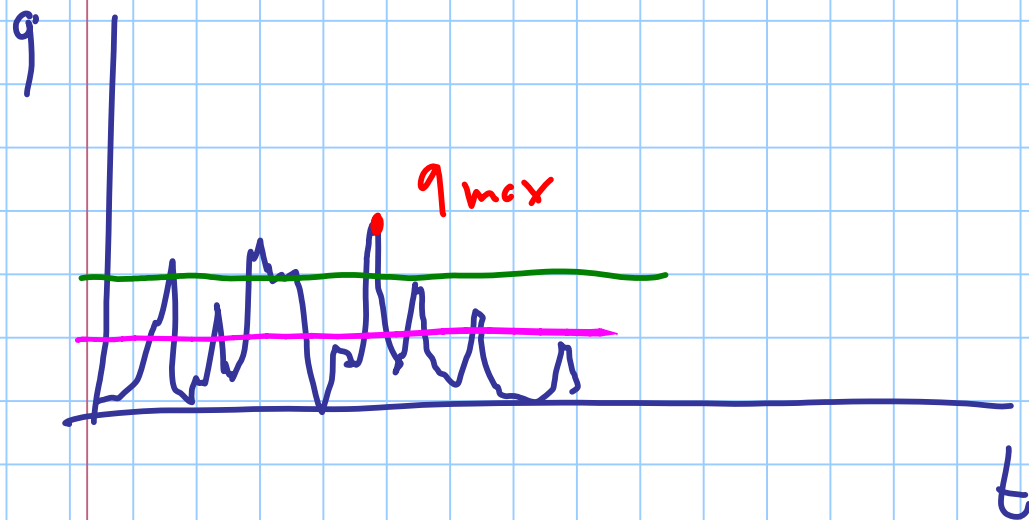
$$q_k = 0.5 \text{ KN/m}^2$$

folla compatte
(ponti)

$$q_k = 5.0 \text{ KN/m}^2$$

neve

dipende dalla zona



$q_k = \text{frattile } 95\%$
di q_{max}

valore RARO

valore FREQUENTE

frattile 95% durante
la vita

valore QUASI PERMANENTE

valore medio durante
la vita

valore frequente $\Psi_1 q_k$

valore quasi permanente $\Psi_2 q_k$

$$q_k > \psi_1 q_k > \psi_2 q_k$$

caratteristico
(raro) frequente quasi permanente

VALORE DI COMBINAZIONE

quando ci sono due carichi variabili distinti
(indipendenti)

$$\psi_0 q_k$$

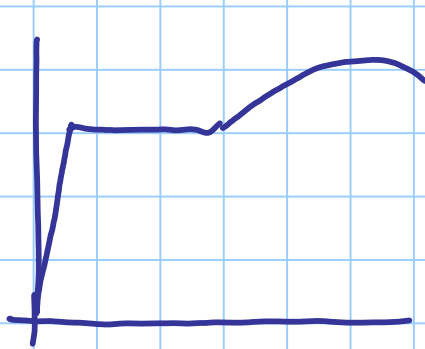
NORMATIVA

del 1905

basata su elasticità lineare

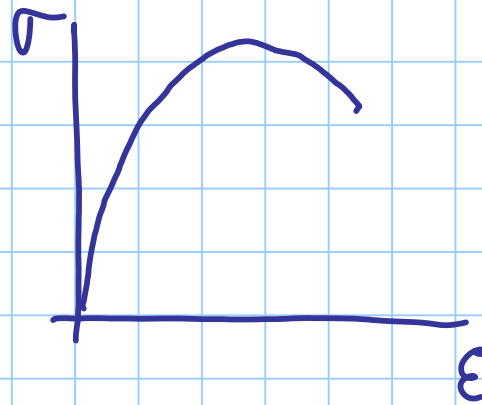
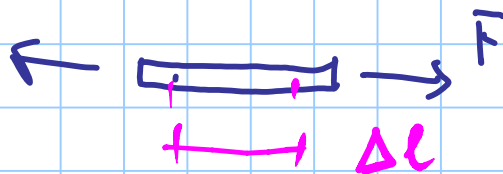
con coefficienti di sicurezza

$\frac{F}{A} = \sigma$



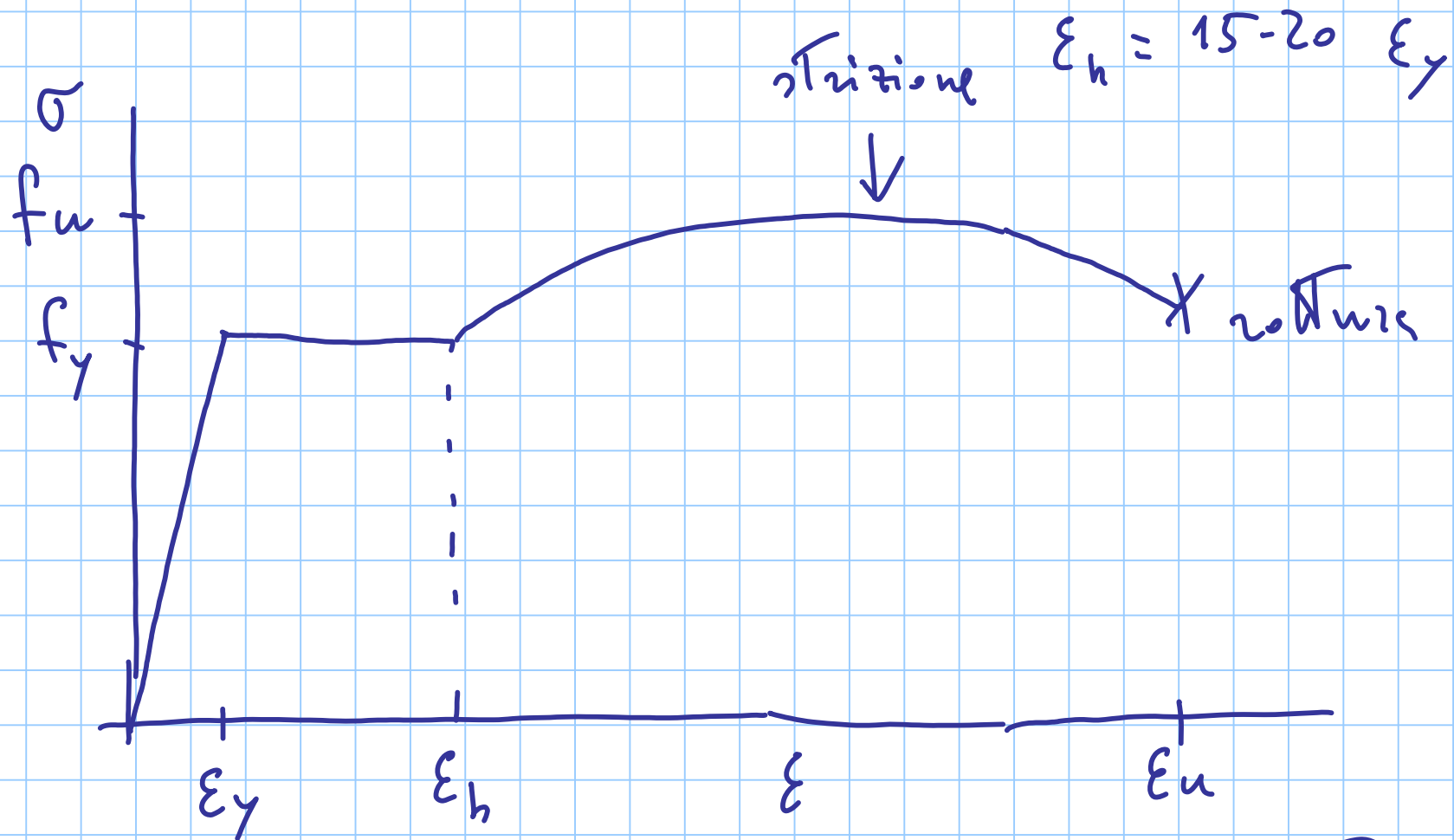
$$\epsilon = \frac{\Delta l}{l}$$

acciaio



calcestruzzo



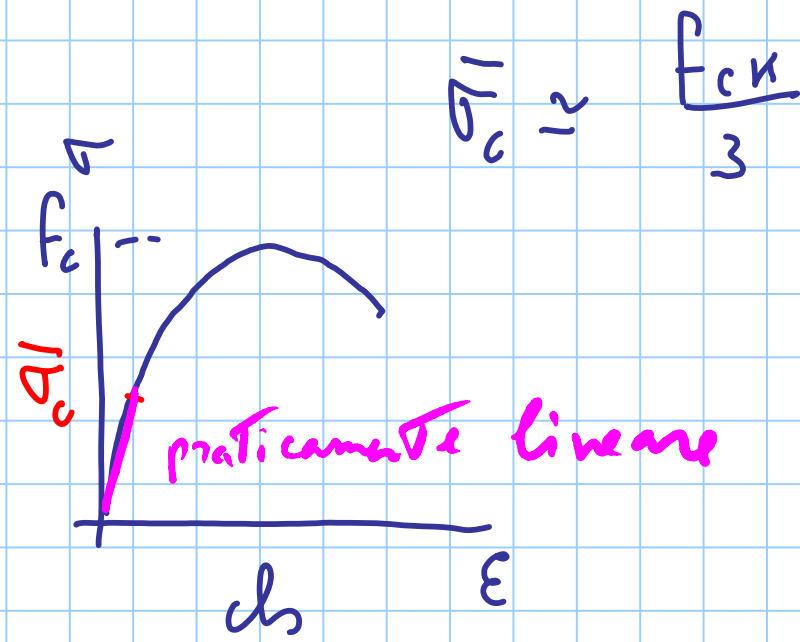
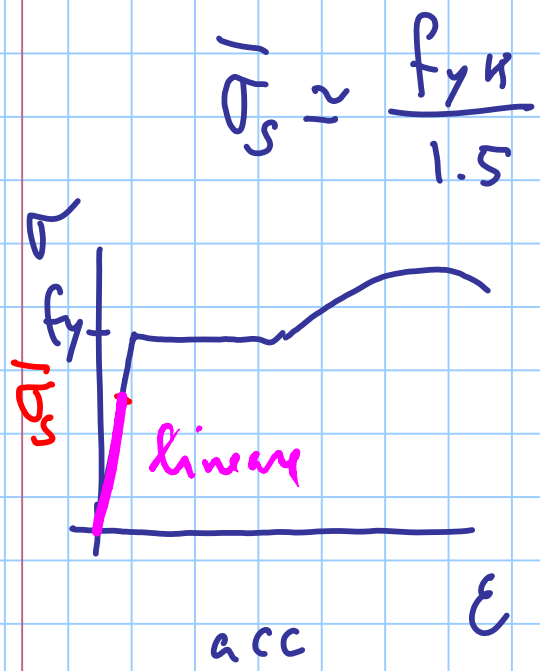


y → yielding (snervamento)

h → hardening (incrudimento)

$$\sigma_s = E_s \epsilon$$

$$E = 206000 \text{ MPa}$$



usare

carichi

g_k q_k

resistente

più piccolo

σ_s

σ_c

tensioni
ammmissibili

metodo delle Tensioni Ammissibili

carichi

$$g_k \quad q_k$$

resistenze

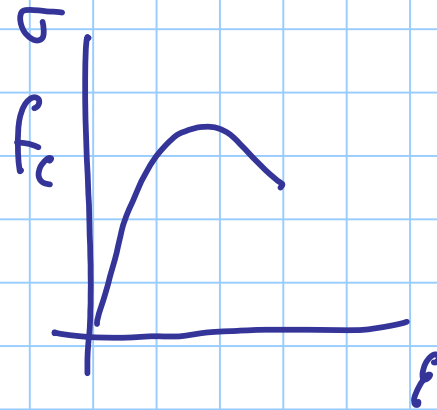
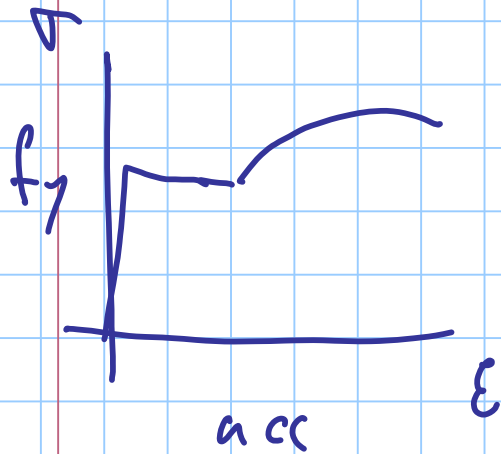
$$f_{yk} = \frac{f_{yk}}{\gamma}$$

$$f_{cd} = \frac{f_{cd}}{\gamma}$$

γ i
coeff.
di sicurezza

comportamento lineare

Calcolo a ROTTURA



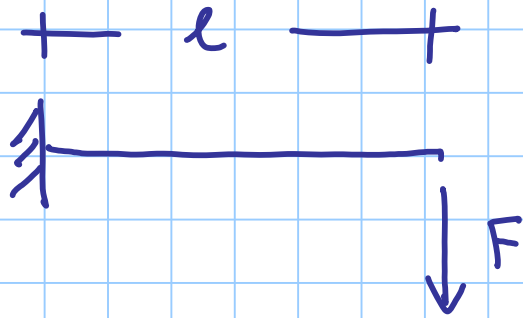
resistenza ultima della sezione

tenendo conto
della non linearità

coefficiente di sicurezza
applicato ai carichi

$$F_k \rightarrow \downarrow F_k / \gamma$$

$$M = F l \leq M_u$$



I W modulo di resistenza
max

$$M_E = F l$$

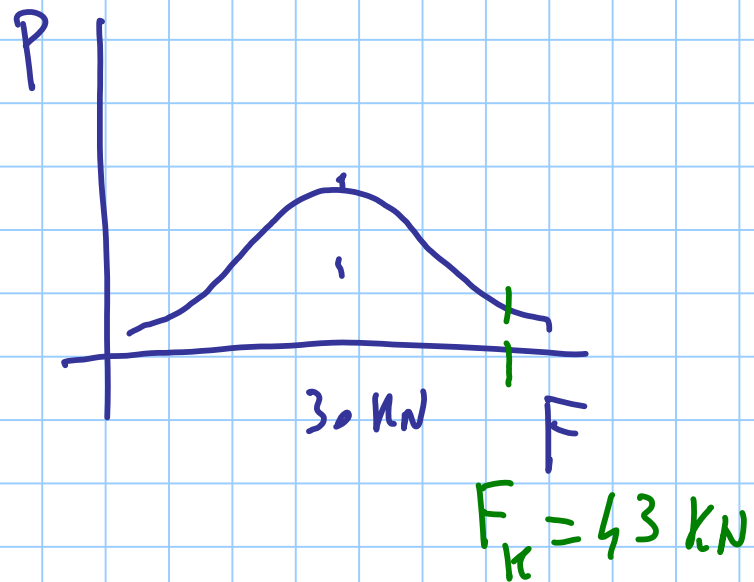


effetto dei carichi, valore sollecitante

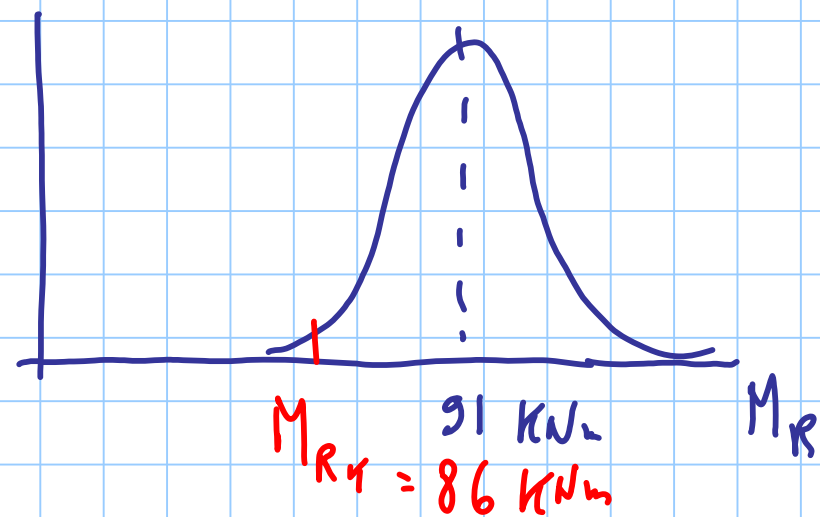
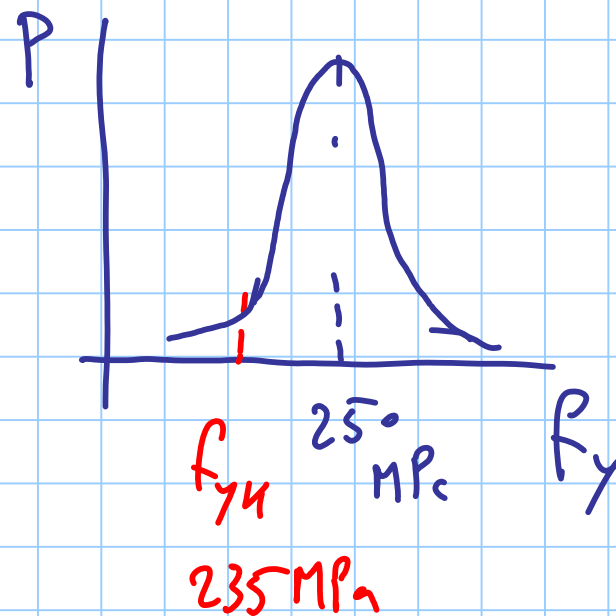
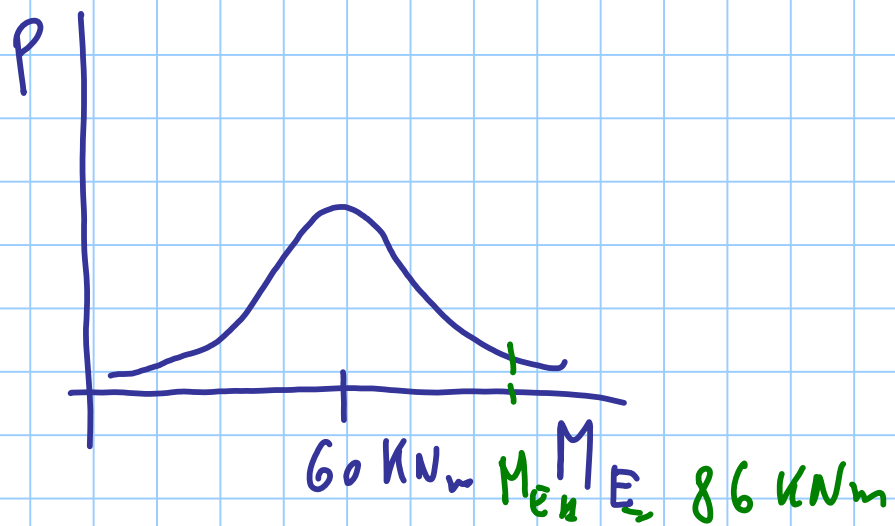
$$M_R = W f_y$$



resistente



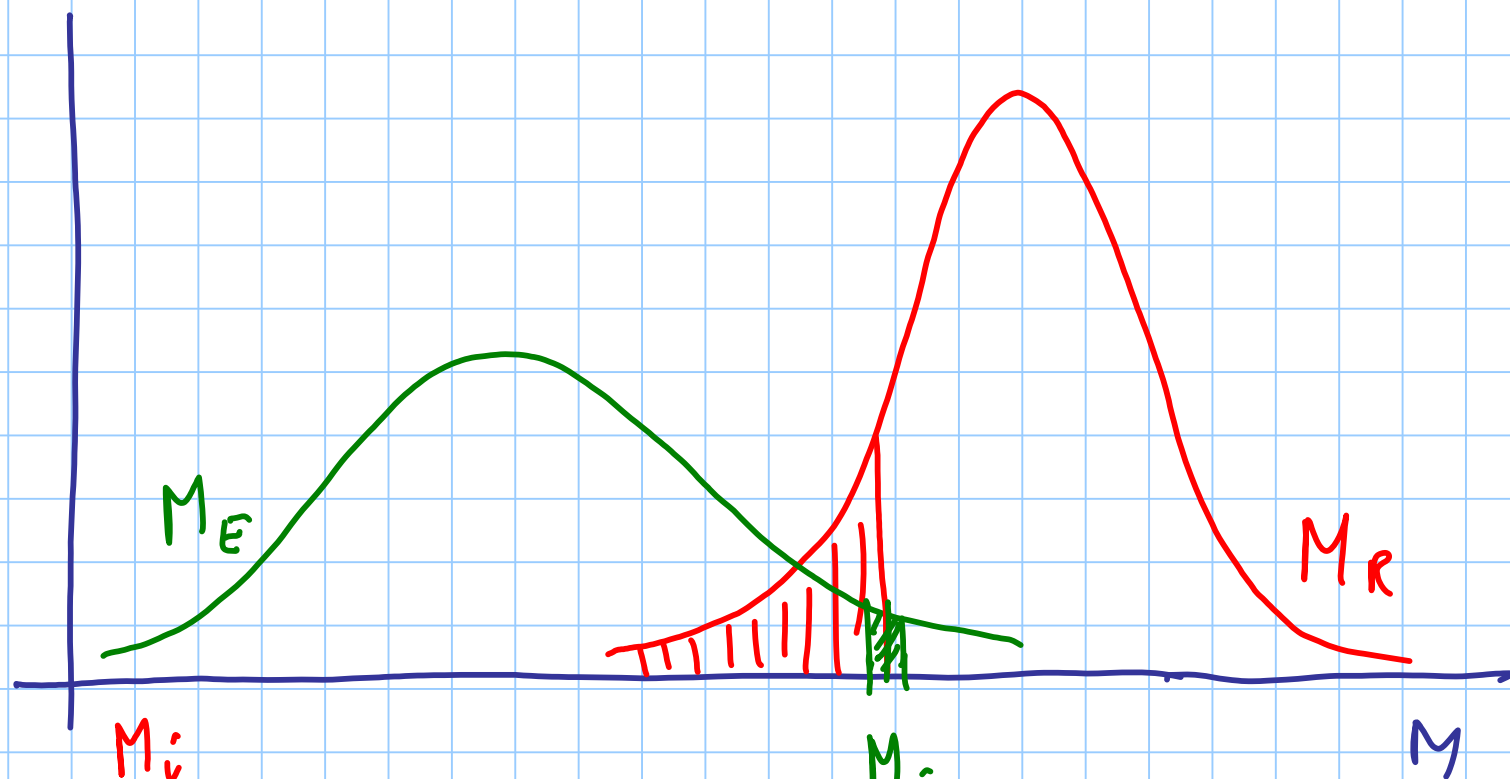
$$l = 2.00$$



valutare la probabilità di collasso

- metodo di Montecarlo

- approccio teorico (integrali...)



$$\int_0^{M_i} M_R dM$$

$$H dM$$

$$M_i \cdot dM$$

probabilità di collisione $\propto M_e \simeq M_i$

$$\left[\int_0^{M_i} M_R dM \right] \cdot M_i dM$$

probabilità di collisione in tutti gli M_e

$$\int_0^{\infty} \left[\int_0^{M_i} M_R dM \right] \cdot M_{ei} dM$$