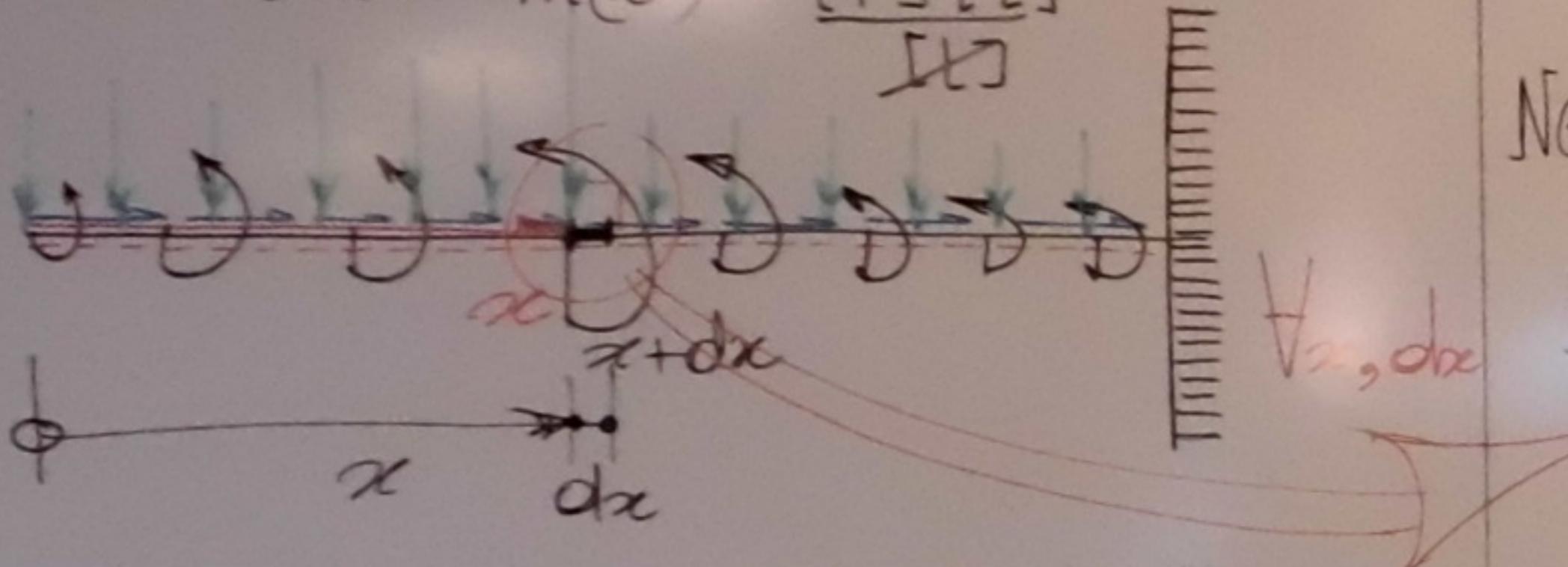


Equazioni indefinite del concio di trave (rettilinee)

Random distribution $p(x)$

coffee distribute m(x) [F] EI



(In realtà processo al limite, con Δx finito)

el lim $\left(\frac{f(x+\Delta x) - f(x)}{\Delta x} \right)^1$ - Al 1^o ord., $df = f'(x) dx = \frac{df(x)}{dx} dx$
 differenzierbar $f(x)$

equilibrio del conciò in
sede molecolare

Eg di equilibrium

$$\bullet \sum F_{x_i} = 0 \Rightarrow \cancel{F(x)} + \frac{dN(x)dx}{dx} - \cancel{F(x)} + p(x)dx = 0 \Rightarrow \cancel{F(x)} = \frac{dp(x)}{dx} = -p(x)$$

$$\bullet \sum_{p_i} M_i^{\frac{dx}{dx}} = 0 \Rightarrow M(x) + \overbrace{\frac{d(Mx)}{dx}}^{\text{term}} - M(x) + m(x)dx - T(x)dx + \alpha x dx = 0$$

N.B. Tramite passaggio al limite ($\lim_{\Delta x \rightarrow 0}$)

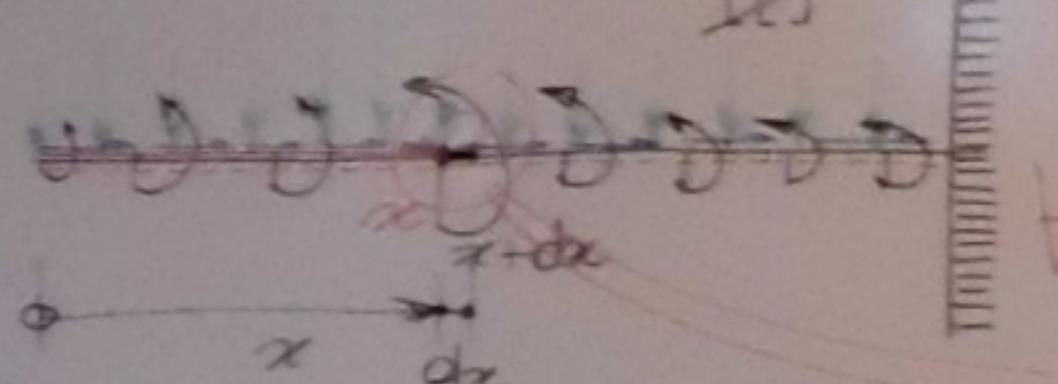
cioè conduce al concetto e definizione di
derivate prime, come limite di rapporto
incrementale

Equazioni indefinite del concio di trave (rettilinea)

carichi distribuiti:

($\int q(x)dx = 0$, $m=0$)

carri distribuiti $m(x)$



In realtà faccio all'infinito, con Δx finito

e $\lim_{\Delta x \rightarrow 0}$ al 1° ord., $df = f'(x)dx = \frac{df(x)}{dx}dx$
differenziale 1° di $f(x)$

al 1° ordine
 $\frac{dT(x)}{dx}dx$
equilibrio del concio in
solo indefinita

$$\frac{dN(x)}{dx}dx$$

$$N(x) + dM$$

$$T(x)$$

$$M(x)$$

$$P(x+dx)$$

$$N(x) + dN$$

$$\frac{dN(x)}{dx}dx$$

$$T(x) + dT$$

$$\frac{dT(x)}{dx}dx$$

$$M(x) + dM$$

$$P(x+dx)$$

$$N(x) + dN$$

$$\frac{dN(x)}{dx}dx$$

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$$\frac{dT(x)}{dx}dx$$

$$M(x) + dM$$

$$P(x+dx)$$

$$N(x) + dN$$

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$$\frac{dT(x)}{dx}dx$$

$$M(x) + dM$$

$$P(x+dx)$$

$$N(x) + dN$$

$$\frac{dN(x)}{dx}dx$$

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$$M(x) + dM$$

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$$M(x) + dM$$

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$$M(x) + dM$$

$$P(x+dx)$$

$$N(x) + dN$$

$$\frac{dN(x)}{dx}dx$$

$$T(x) + dT$$

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$$M(x) + dM$$

$$P(x+dx)$$

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$$M(x) + dM$$

$$P(x+dx)$$

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$$\frac{dT(x)}{dx}dx$$

$$M(x) + dM$$

$$P(x+dx)$$

$$N(x) + dN$$

$$\frac{dN(x)}{dx}dx$$

$$T(x) + dT$$

$$\frac{dT(x)}{dx}dx$$

$$M(x) + dM$$

$$P(x+dx)$$

$$N(x) + dN$$

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$$M(x) + dM$$

$$P(x+dx)$$

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$$\frac{dN(x)}{dx}dx$$

$$T(x) + dT$$

$$\frac{dT(x)}{dx}dx$$

$$M(x) + dM$$

$$P(x+dx)$$

$$N(x) + dN$$

$$\frac{dN(x)}{dx}dx$$

$$T(x) + dT$$

$$\frac{dT(x)}{dx}dx$$

$$M(x) + dM$$

$$P(x+dx)$$

$$N(x) + dN$$

$$\frac{dN(x)}{dx}dx$$

$$T(x) + dT$$

$$\frac{dT(x)}{dx}dx$$

$$M(x) + dM$$

$$P(x+dx)$$

$$N(x) + dN$$

$$\frac{dN(x)}{dx}dx$$

$$T(x) + dT$$

$$\frac{dT(x)}{dx}dx$$

$$M(x) + dM$$

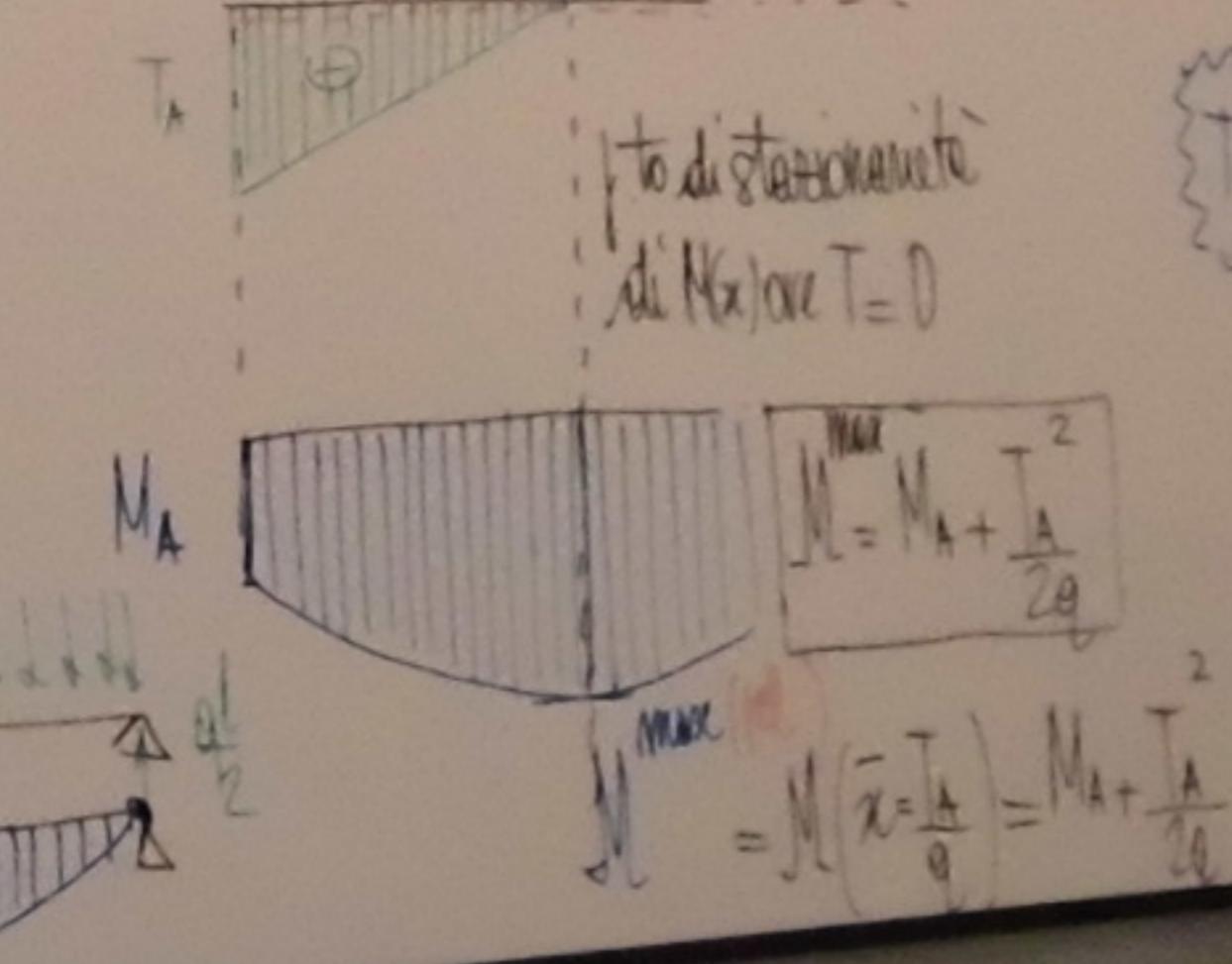
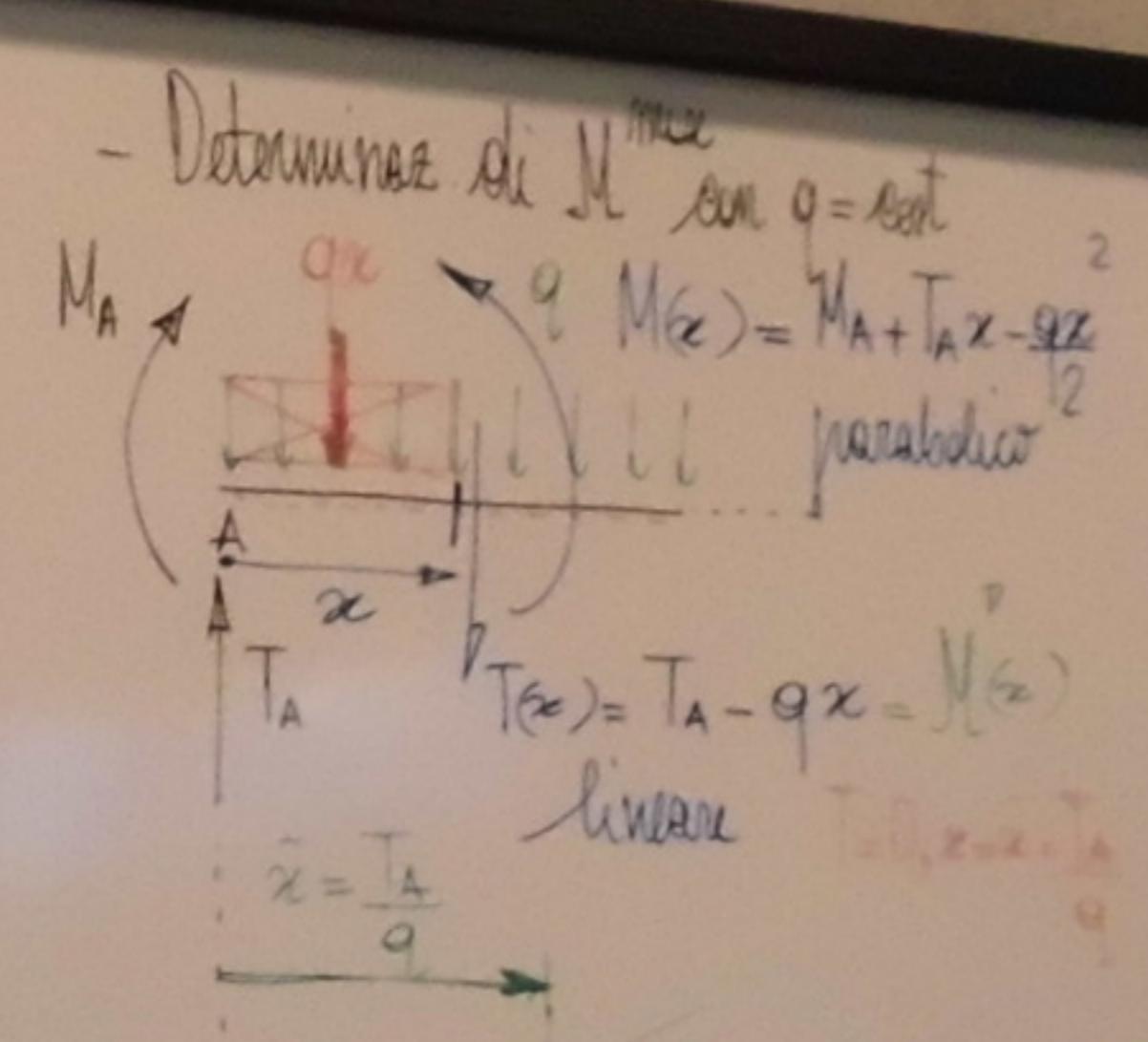
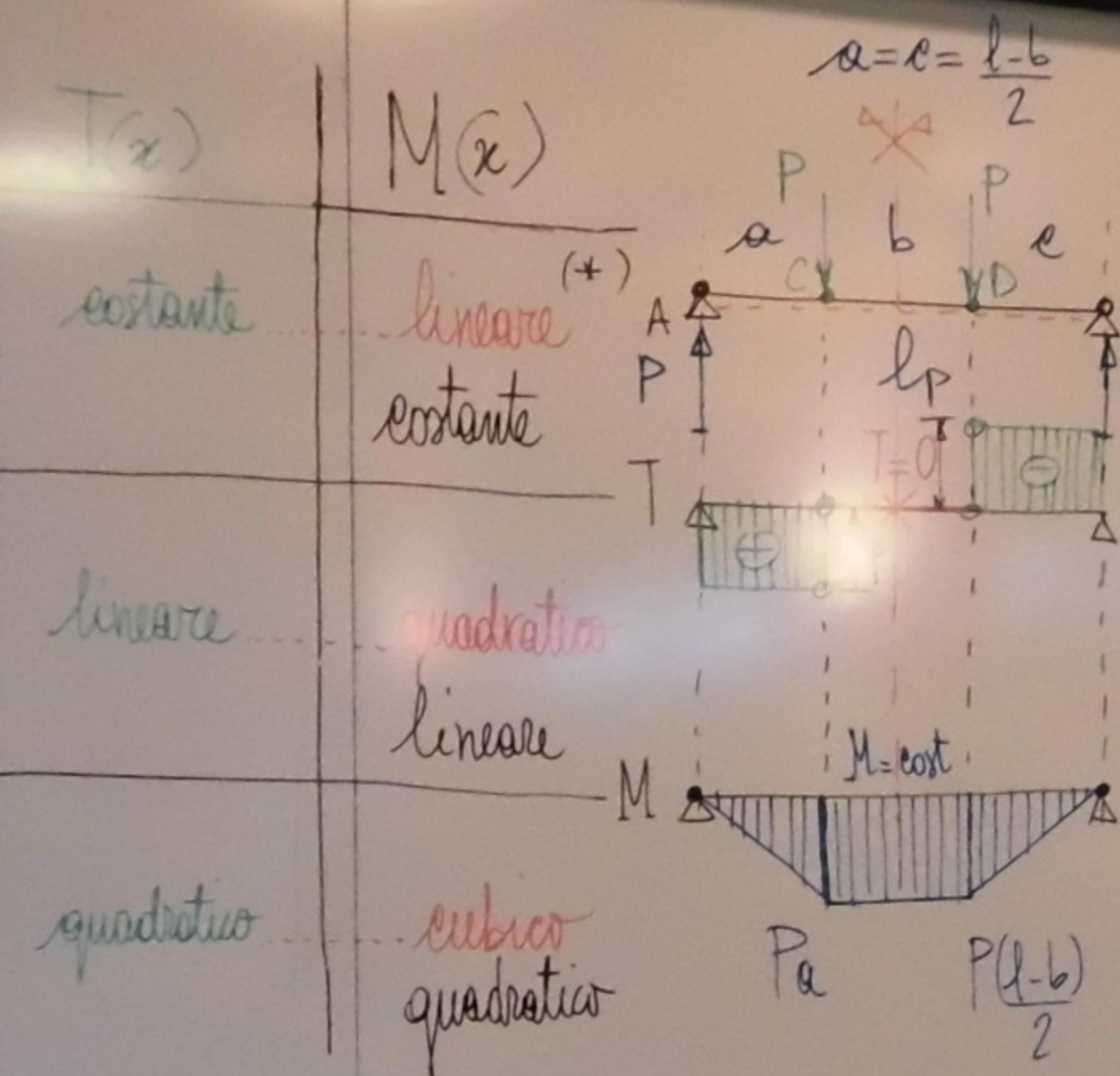
$$P(x+dx)$$

Casi tipici

Carico	$N(x)$	$T(x)$	$M(x)$
$p=0$ $q=0$ $m=0$	tratto scarico	costante	costante
$p=\text{cost}$ $q=\text{cost}$ $m=\text{cost}$	tratto con carico uniforme dist.	lineare	lineare costante
$p=\text{lin}$ $q=\text{lin}$ $m=\text{lin}$	tratto con carico linearmente dist.	quadratico	quadratico lineare cubico quadratico

(*) Contiene il caso costante come caso flett. ($T=0$)

→ Vedi es. prova di flessione su quattro punti



$$\begin{aligned} & - \text{Determinazione di } M_{\max} \text{ con } q=\text{cost} \\ & M(x) = M_A + T_A x - \frac{q x^2}{2} \quad \text{parabolico} \\ & M_A \quad \text{lineare} \\ & T_A = T_A - q x = M(x) \\ & x = \frac{T_A}{q} \end{aligned}$$

Commenti sulle AI

{ $T_A - T_B = F$ }

to distorsività
di $N(x)$ ore $T=0$

$\{T_A - T_B = F\}$

$M=0$

$T=0$

$N=0$

$M=0$

$T=0$

$N=0$

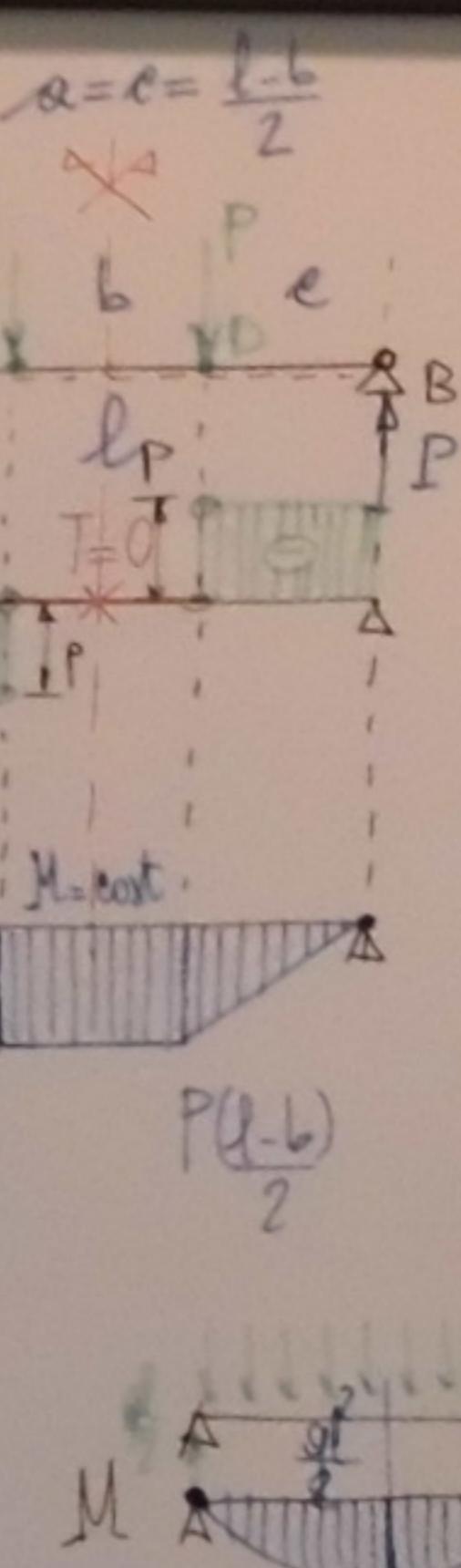
$M=0$

$T=0$

$N=0$

$M=0$

Casì tipice			
Caso	$N(x)$	$T(x)$	$M(x)$
$p=0$	tratto costante	costante	lineare ⁽⁺⁾
$m=0$	scarico	costante	costante
$p \neq 0$	tratto con varico	lineare	
$m \neq 0$	carico	quadratica	quadratico
$m = 0$	tratta costante	lineare	lineare
$p \neq 0, m \neq 0$	tratto con varico	quadratico	cubico
$m = 0, p \neq 0$	lineare costante	quadratico	quadratico



- Determinație di M^{\max} con $q = \text{const.}$

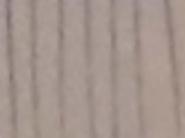
The diagram shows a horizontal beam segment from point A to a distance x. At point A, there is an upward force T_A and a clockwise moment M_A . A red vertical arrow at position x indicates a distributed load qx acting downwards. The bending moment $M(x)$ is shown as a parabola starting at M_A at $x=0$, decreasing linearly to zero at x , and then increasing parabolically. The equation for the bending moment is given as $M(x) = M_A + T_A x - \frac{qx^2}{2}$.

$M(x) = M_A + T_A x - \frac{qx^2}{2}$ parabolic

$T(x) = T_A - qx - M(x)$ linear

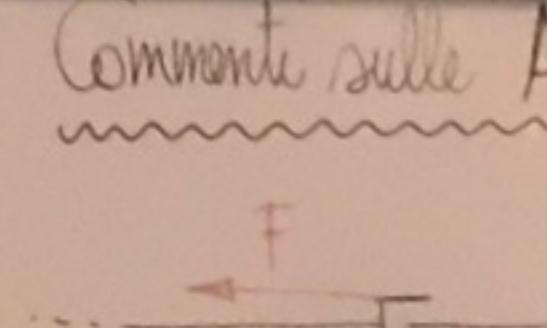
$x = \frac{T_A}{q}$

foto di stazionarietà
di $N(x)$ ore $T=0$



$$M_{\text{max}} = M_A + \frac{T_A^2}{2g}$$

Commenti sulle AI



三〇

11

Ms. A

- Determinar el M_{max} con $\alpha = \text{const}$. 2
 $\alpha = c = \frac{l_A}{2}$
 M_A qx $M(x) = M_A + T_A x - \frac{qx^2}{2}$
 parabólico
 $T(x) = T_A - qx = M(x)$
 lineal $T=0, x=\bar{x}=\frac{T_A}{q}$

A hand-drawn diagram illustrating beam theory. At the top, a horizontal beam segment is shown with a central point labeled 'P'. Above this point, the beam is divided into three segments labeled 'a', 'b', and 'c' from left to right. A vertical force vector labeled 'P' is applied at point 'a'. To the right of point 'b', there is a downward-pointing arrow labeled 'l_P'. Below the beam, a rectangular area is shaded green, representing a load distribution. A red double-headed arrow below this shaded area indicates its width. The beam ends at a point labeled 'M'. Below the beam, a deflection curve is drawn as a downward-opening parabola. The left end of this curve is labeled 'P_1' and the right end is labeled 'P_{1+e}'. The center of the deflection curve is labeled 'P_2'.

Commenti sulle AI

$$NS = -1 \Rightarrow \epsilon = 0$$

$$\left\{ T_S - T_d = F \right\}$$

$$N=0$$

$$T=0$$

A diagram illustrating a particle scattering process. A horizontal black line represents an incoming particle. It passes through a black circle representing an interaction vertex. From this vertex, a red curved arrow labeled 'W' indicates the direction of the outgoing particle. Below the vertex, the text 'M = 0' is written.

$$T_{\text{sotto}} \neq T_{\text{sopra}}$$

$$T_3 = 0$$

$$M_5 = 0$$

A free body diagram of a beam section labeled A-A. The beam has a total length l_d . At the left end, there is a downward force T_s and a horizontal force $N = 0$. At the right end, there is an upward force T_d . A green arrow labeled $F_A = \dots$ points upwards from the center of the beam. A vertical dashed line extends downwards from the center of the beam, representing the neutral axis.

A diagram showing a horizontal line representing a spring. Three circular nodes are attached to the line at different points. The first node on the left is labeled 'A' above it and has a vertical arrow pointing down labeled 'F'. The middle node is labeled 'B' below it and has a vertical arrow pointing up labeled 'F'. The third node on the right is labeled 'C' above it and has a vertical arrow pointing down labeled 'F'. Between the first and second nodes, there is a double-headed arrow labeled 'AC' with a dot between them, indicating a spring or force between them.