

# Scienza delle Costruzioni - Ingegneria Civile

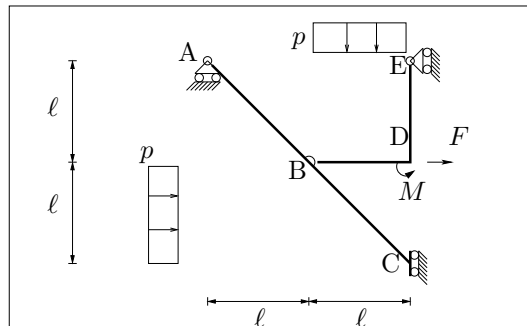
Prof. Angelo Luongo - 20/07/2009

SdC 9CFU: ES. 1, 2, 3; DURATA: 4 H

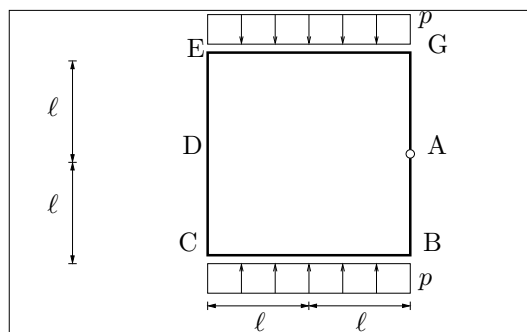
SdC I 6CFU: ES. 1, 2; DURATA: 3 H

SdC II 6CFU: ES. 3; DURATA: 2 H

**Esercizio 1:** Scrivere e diagrammare le leggi di variazione delle caratteristiche di sollecitazione per la struttura in figura, nel caso in cui siano  $\ell = 4$  m,  $p = 20 \frac{\text{KN}}{\text{m}}$ ,  $F = 40$  KN,  $M = 20$  KNm. {Calcolare la rotazione della sezione in A, essendo  $EI = 64000 \text{ KNm}^2$  }<sup>1</sup>.



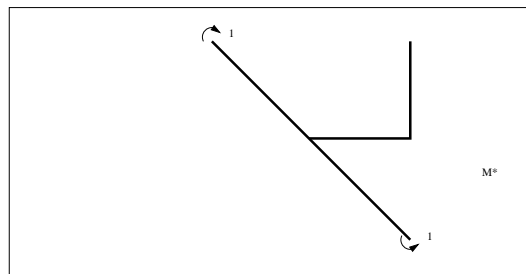
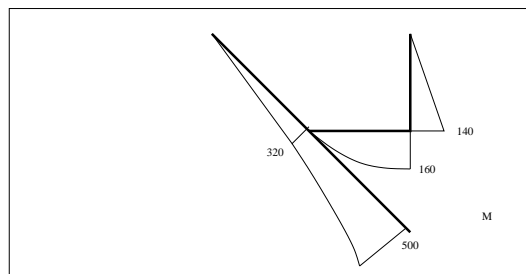
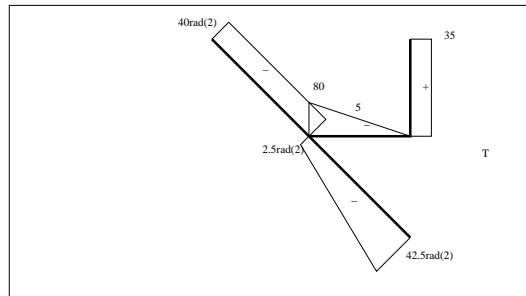
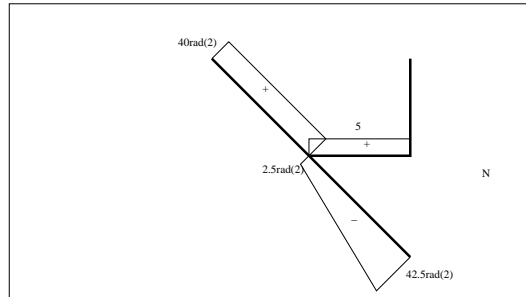
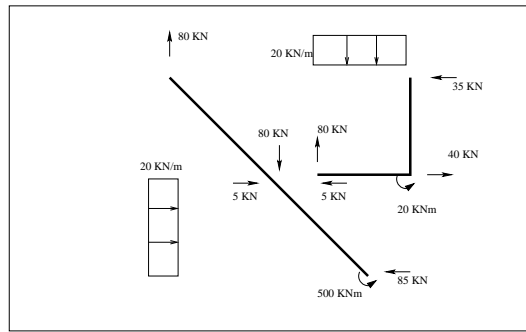
**Esercizio 2:** Diagrammare le caratteristiche di sollecitazione per la struttura in figura nel caso in cui sia  $\ell = 4$  m,  $p = 20 \frac{\text{KN}}{\text{m}}$ ,  $EI = 6.4 \times 10^4 \text{ KNm}^2$ ,  $EA \rightarrow +\infty$ .



**Esercizio 3:** Verrà aggiunto in seguito

<sup>1</sup>Domanda riservata agli studenti SdC I 6cfu

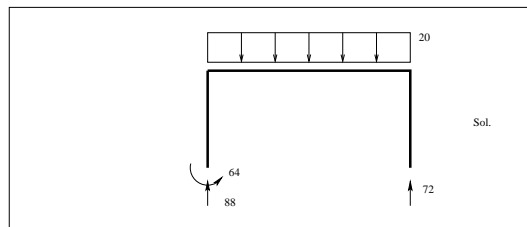
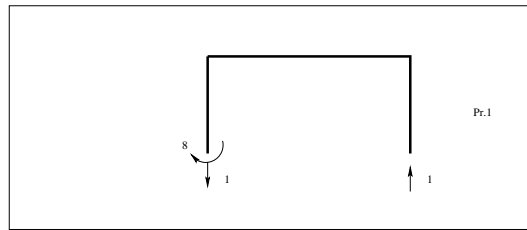
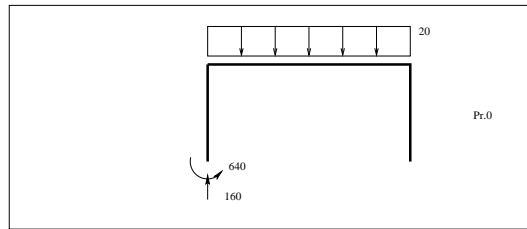
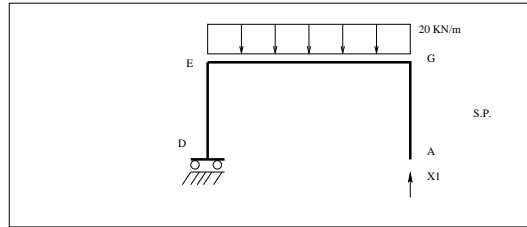
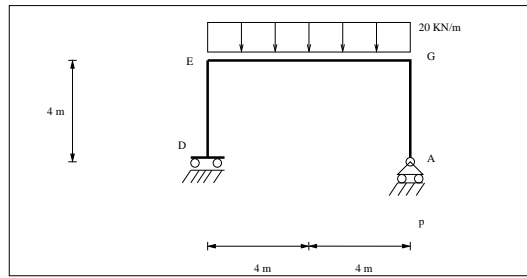
# Esercizio 1:



	N	T	M	M*
AB	$40\sqrt{2}$	$-40\sqrt{2}$	$40\sqrt{2}x$	1
CB	$-42.5\sqrt{2} + 10x$	$-42.5\sqrt{2} + 10x$	$-500 + 42.5\sqrt{2}x - 5x^2$	-1
BD	5	$-80 + 20x$	$80x - 10x^2$	0
ED	0	35	$-35x$	0

$$1\varphi_A = \frac{1}{EI} \int_{\mathcal{D}} MM^* dx = 0.048 \text{ rad}$$

Esercizio 2:



	$M_0$	$M'_1$
DE	-640	8
EG	$-640 + 160x - 10x^2$	$8 - x$
AG	0	0

$$\eta_{11} = \frac{1280}{3EI}$$

$$\eta_{10} = -\frac{30720}{EI}$$

$$\chi_1 = 72 \text{ kN}$$

