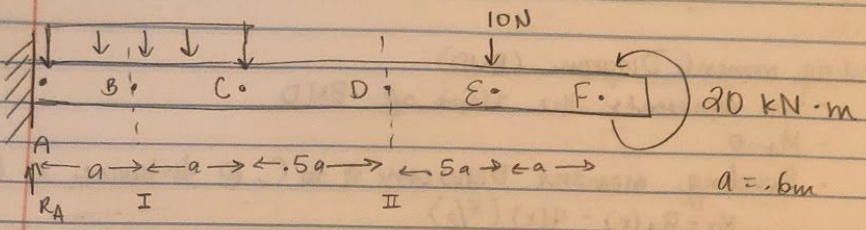
Quiz #6



$a = .6m$

$\Sigma F_y = 0$

$R_A = 4(2a) + 10 = 4(1.2) + 10 = 14.8\ kN$

1. @ cross section I

Shear force $= R_A - 4a = 14.8kN - 4(.6) = 14(8) - 2.4 = 12.4\ kN$

Bending moment @ cross section I

$M_I = R_A(a) - 4(a)(a/2) = 14.8(.6) - 2(.6)^2 = 8.16\ kN \cdot m$

2. @ cross section II

Shear force $= R_A - 4(2a) = 14.8 - 8(.6) = 14.8 - 4.8 = 10\ kN$

Bending moment @ cross section II

$M_{II} = R_A(2.5a) - 4(2a)(1.5a) = 14.8(2.5)(.6) - 12a^2 = 22.2 - 4.32 = 17.88\ kNm$

3. Shear force diagram

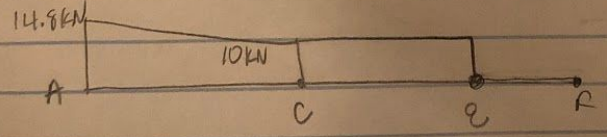
@ point A $\Rightarrow 14.8\ kN$

bt point A and C @ distance x from A

$F = R_A - 4x$

@ point E - F $\Rightarrow 14.8 - 4(2a) - 10 = 14.8 - 4.8 - 10 = 0$

So SFD



Maximum shear force @ point A

Quiz #6 Cont.

3 Cont. Bending moment Diagram (BMD)

- SFD represents the slope of BMD
- $M_A = 0$
- Bending moment between A to C @ distance x from A

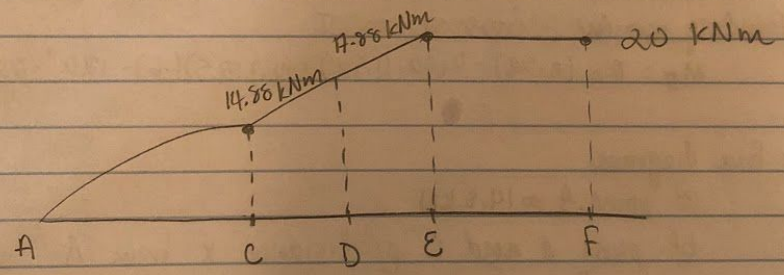
$$M_x = R_A(x) - 4(x)(x/2)$$

$$M_C = 14.8(2a) - 4(2a)(a)$$
$$= 14.8(1.2) - 8(.6)^2$$
$$= 14.88 \text{ kNm}$$

@ point D

$$M_D = 17.88 \text{ kNm}$$

Bending moment Diagram



So maximum Bending moment @ point F.