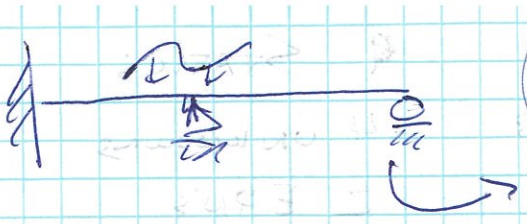
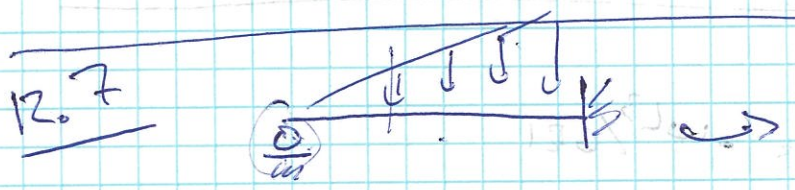


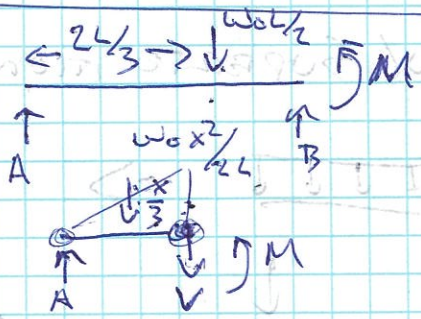
B.C.'s:
$V(0)=0$
$V(L)=0$
$\frac{dv}{dx}(0)=0$
$V(L/2)=0$

STATICS: $\Sigma F=0$;
$\Sigma M=0$;

5 UNKNOWNS (3 REACTION
2 INT. CONST'S)

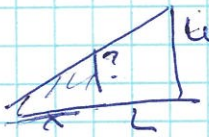
12.7





$\therefore \Sigma F=0 = A+B-\frac{w_0 L}{2}$

$\Sigma M_A=0 = -\frac{w_0 L^2}{3}+BL+M$



$\frac{?}{x}=\frac{w_0}{L}$

$?=\frac{w_0 x^2}{L}$

$F_?=\frac{w_0 x}{L}\cdot\frac{x}{2}=\frac{w_0 x^2}{2L}$

$\Sigma M_x = M-Ax+\frac{w_0 x^3}{6L}=0$

$M(x)=Ax-\frac{w_0 x^3}{6L}=EI\frac{d^3v}{dx^3}$

$EI\frac{dv}{dx}=\frac{1}{2}Ax^2-\frac{w_0 x^4}{24L}+C_1$

$EIv=\frac{1}{6}Ax^3-\frac{w_0 x^5}{120L}+C_1x+C_2$

$v(0)=0 \Rightarrow C_2=0$

$v(L)=0$ (1)

$\frac{dv}{dx}(L)=0$ (2)

(1) $\left(0=\frac{1}{6}AL^3-\frac{w_0L^5}{120L}+C_1L\right)/L = \frac{1}{6}AL^2-\frac{w_0L^3}{120}+C_1=0$

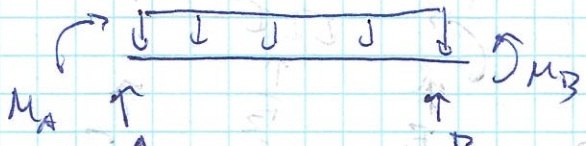
(2) $0=\frac{1}{2}AL^2-\frac{w_0L^4}{24L}+C_1$ $\Rightarrow -\left(\frac{1}{2}AL^2-\frac{w_0L^3}{24}+C_1=0\right)$ $\cdot 1/3$ $\cdot 4/120$

$0=AL^2(\frac{1}{6}-\frac{1}{2})+w_0L^3(-\frac{1}{120}+\frac{1}{24})$

$\Rightarrow \frac{1}{3}AL^2=\frac{w_0L^3}{30}$

$A=\frac{w_0L}{10}$

12.18



STATICS

4 UNKNOWNS

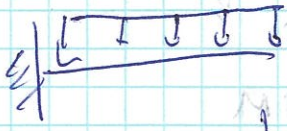
2 EQN's

$\iint M(x) = V(x) \Rightarrow$ 2 UNKNOWNS (INT. CONSTS)

4 BC's: $V(0) = 0$ $\quad dV/dx(0) = 0$

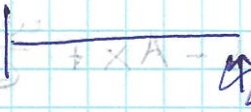
$V(L) = 0$ $\quad dV/dx(L) = 0$

12.18 w/ SUPERPOSITION

1  $\Rightarrow$

$\theta_1 = -wL^3/6EI$

$V_1 = -wL^4/8EI$

2 +  $\Rightarrow$

$\theta_2 = -BL^2/2EI$

$V_2 = -BL^3/3EI$

3 +  $\Rightarrow$

$\theta_3 = M_B L/EI$

$V_3 = M_B L^2/2EI$

$\theta_1 + \theta_2 + \theta_3 = 0$

$$\frac{-wL^3}{6EI} + \frac{BL^2}{2EI} + \frac{M_B L}{EI} = 0$$

$V_1 + V_2 + V_3 = 0$

$$\frac{-wL^4}{8EI} + \frac{BL^3}{3EI} + \frac{M_B L^2}{2EI} = 0$$