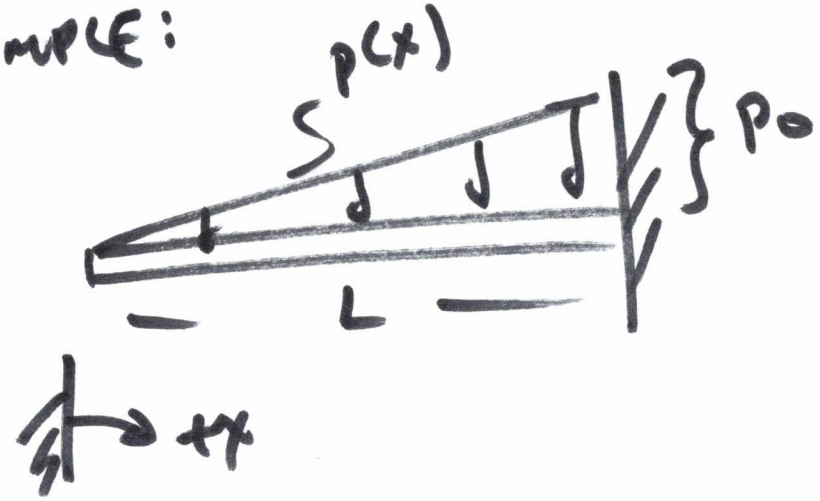
C. Shear & Moment Diagrams

1. equilibrium method
FBD to Find M(x) V(x) & plot it

2. equation (integration) method
Find p(x) & integrate

EXAMPLE:



$y = mx + b$ $\quad x=0,\ p(x)=0$

$p(x) = \underline{m}\,x + \underline{b}$ $\quad x=L\ \ p(x)=-P_0$

$b=0$

$p(x) = mL = -P_0 \qquad m = \frac{-P_0}{L}$

$$p(x) = -\frac{P_0}{L}x$$

$$V = \int p(x)\,dx = \int -\frac{P_0}{L}x\,dx$$

$$V = -\frac{P_0}{L}\frac{x^2}{2} + C_1 \qquad V=0 \text{ @ } x=0,\ C_1 = 0$$

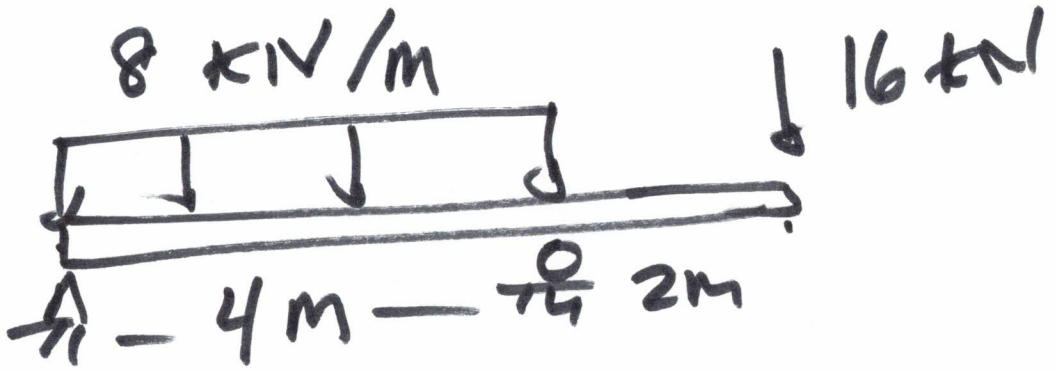
$$M = \int V(x)\,dx = \int -\frac{P_0}{L}\frac{x^2}{2}\,dx$$

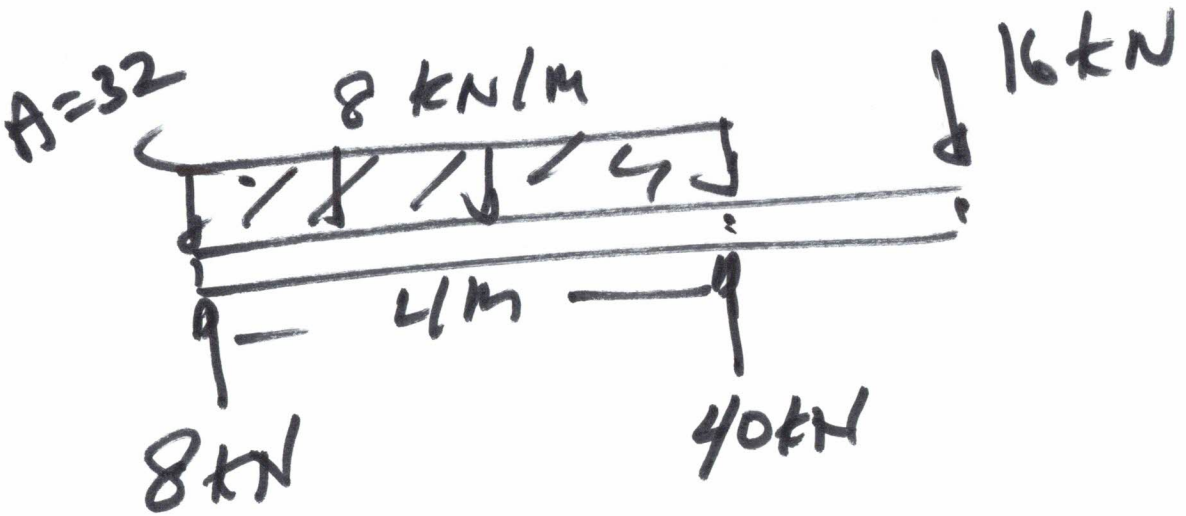
$$M(x) = \frac{-P_0}{L}\frac{x^3}{6} + C_2 \qquad M=0 \text{ @ } x=0,\ C_2 = 0$$

+ then plot

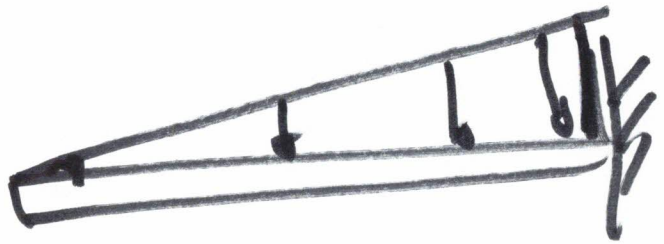
3, Graphical Method

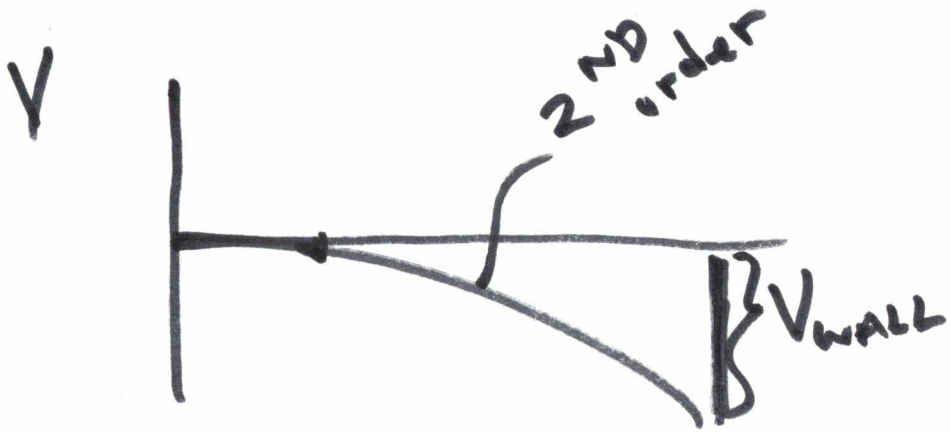
Area under curve is integral

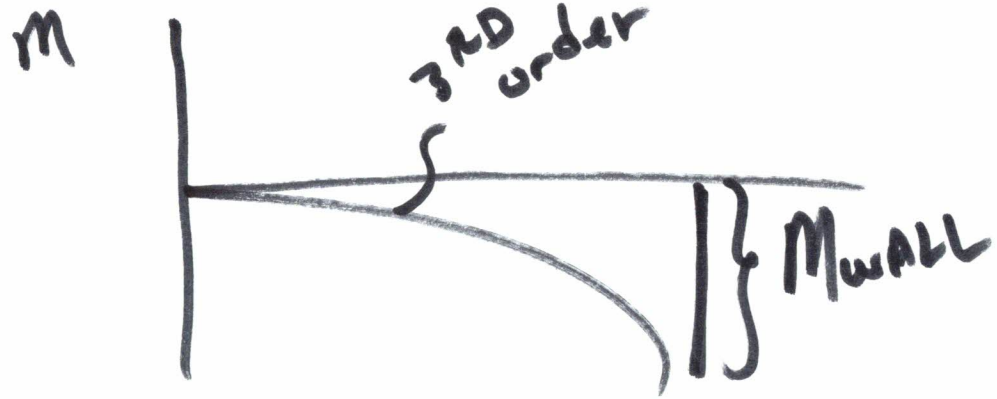


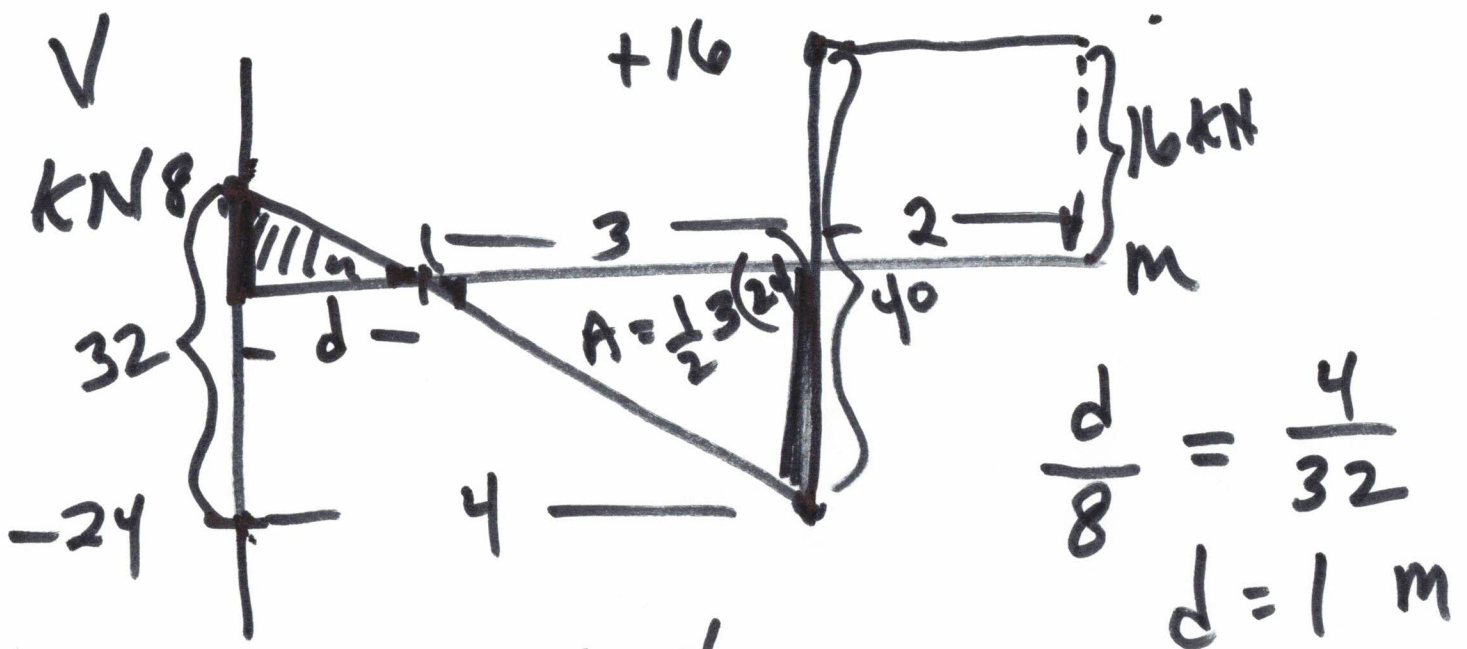


EXAM: PT Forces & Moments
Constant distributed loads
(select) triangle distributed loads









$$\frac{d}{8} = \frac{4}{32}$$

$$d = 1 \text{ m}$$