

REACTIONS, SHEAR FORCE AND MOMENT DIAGRAMS

Example 1

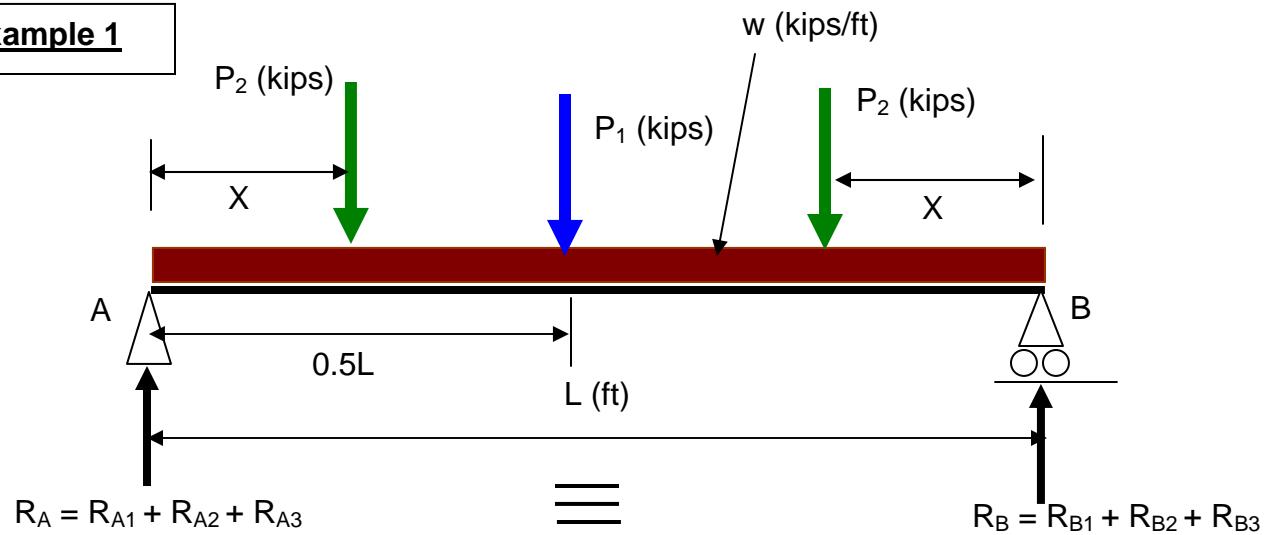


Fig 1

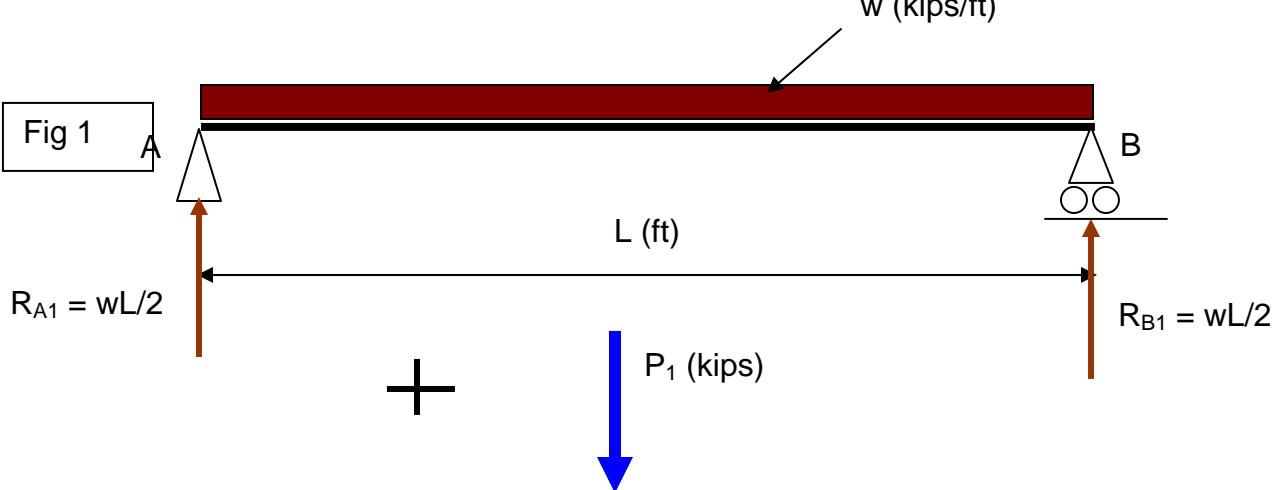


Fig 2

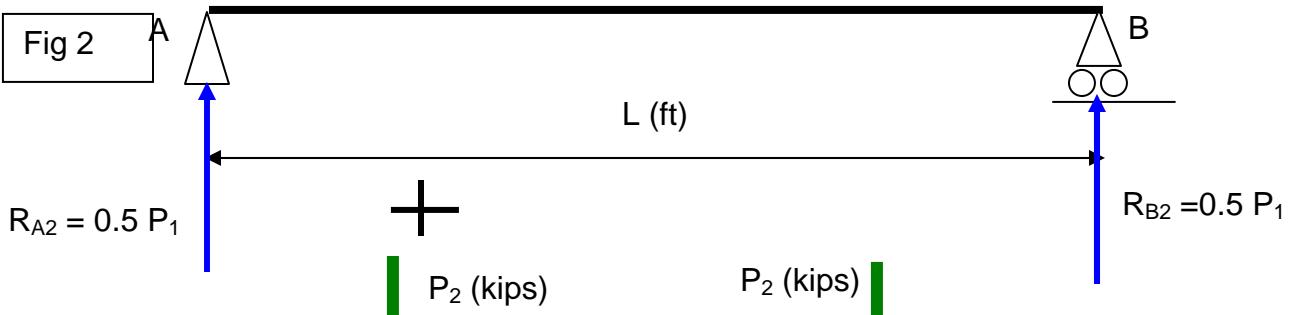
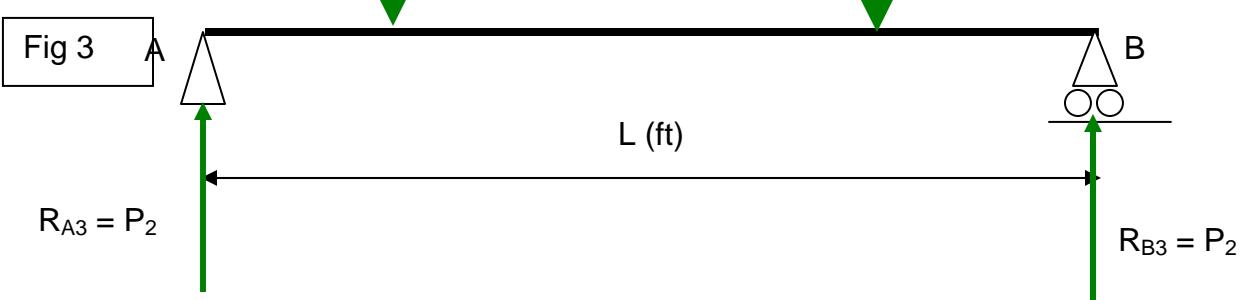
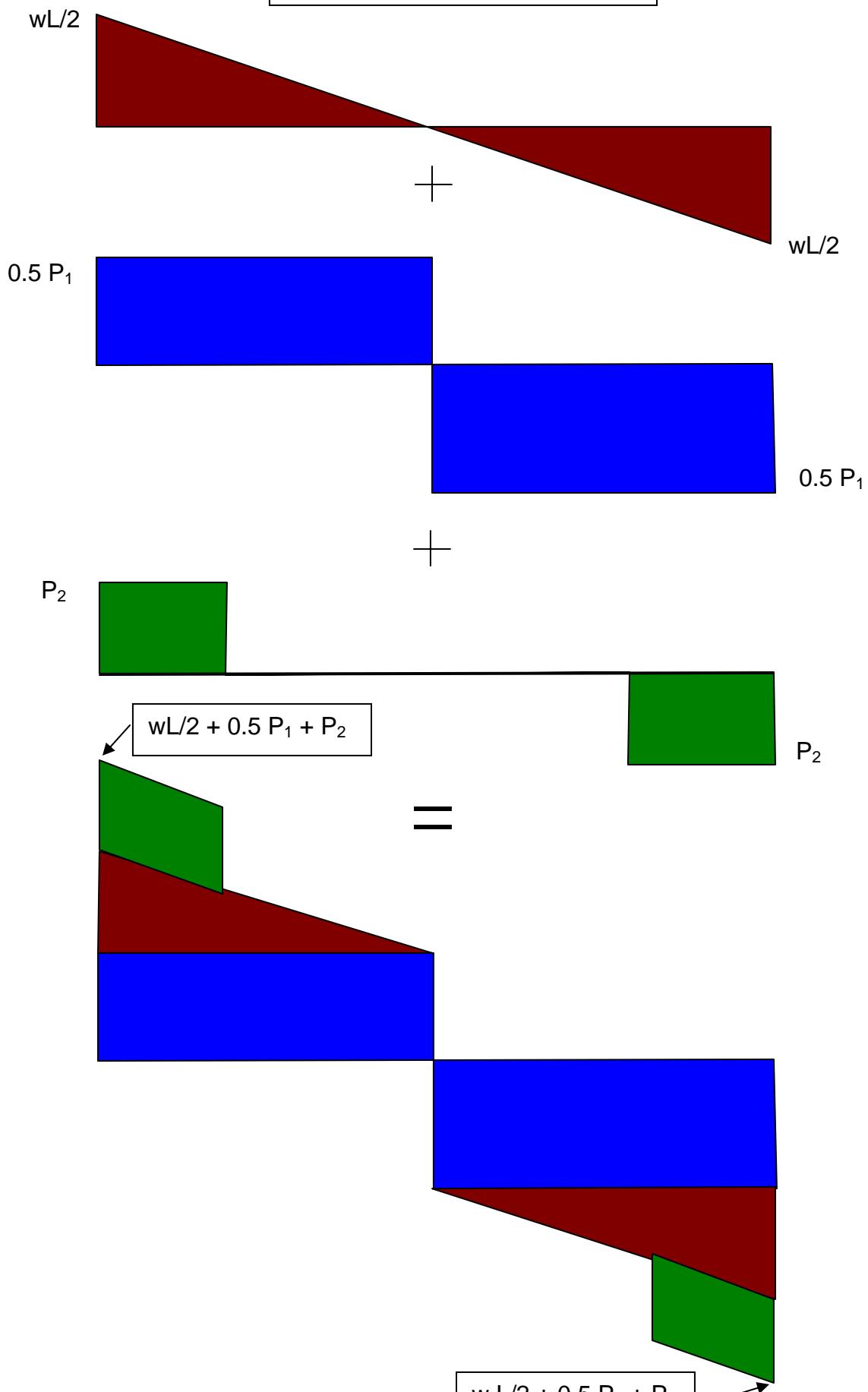


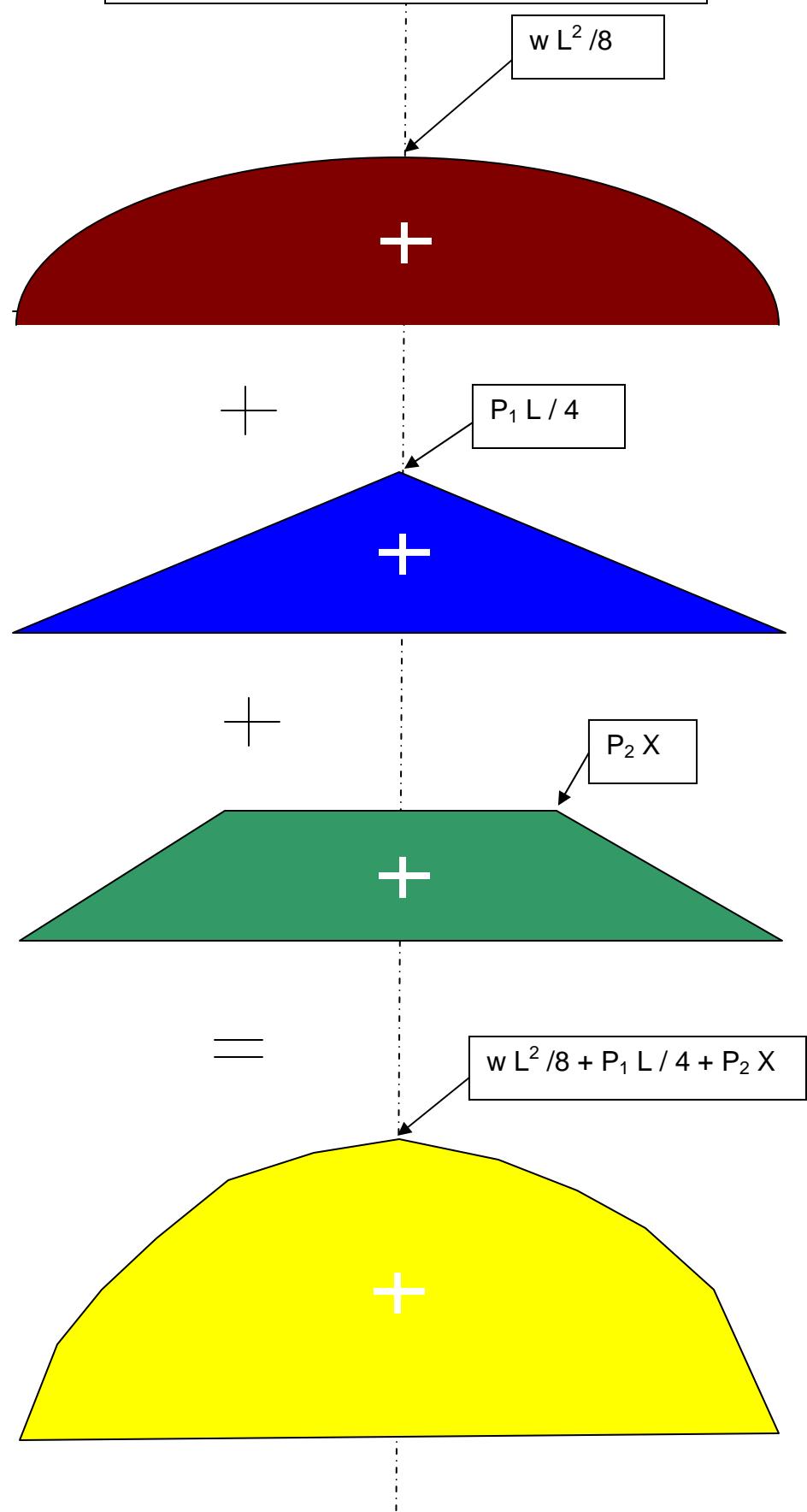
Fig 3



SHEAR FORCE DIAGRAMS



MOMEMT DIAGRAMS



Example 2

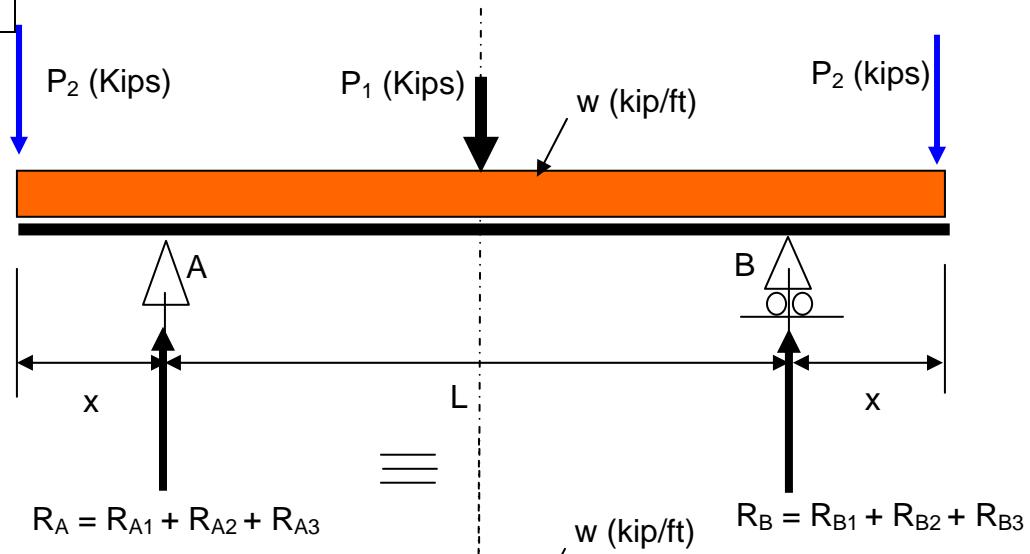


Fig. 1

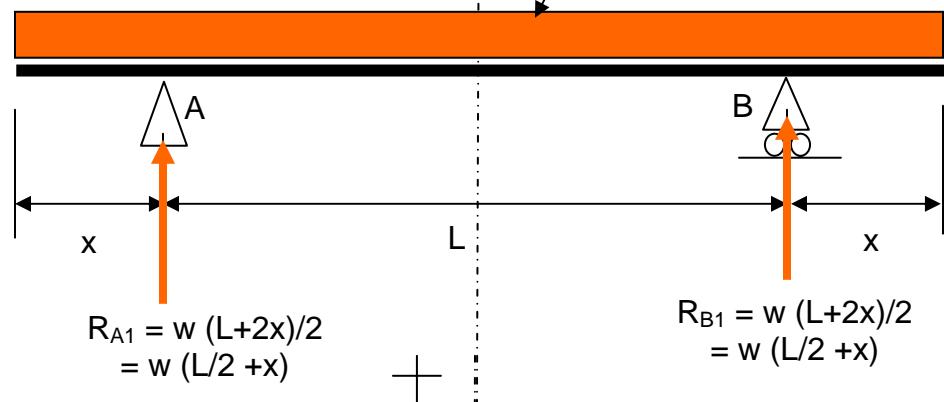


Fig. 2

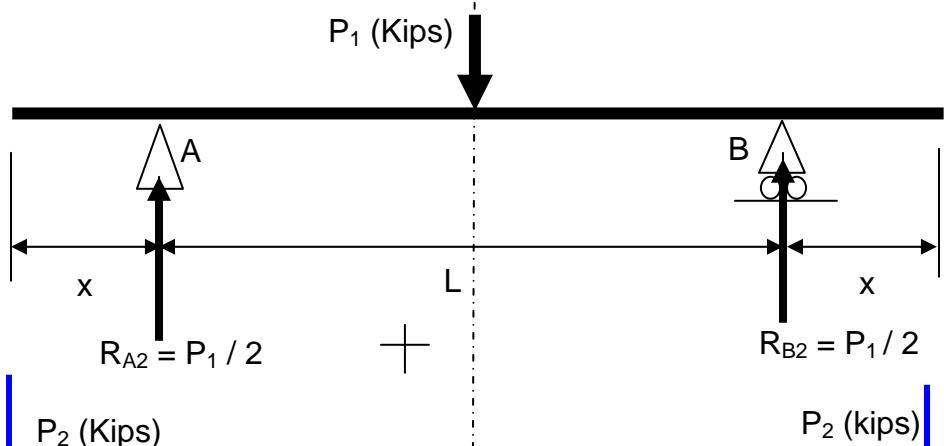
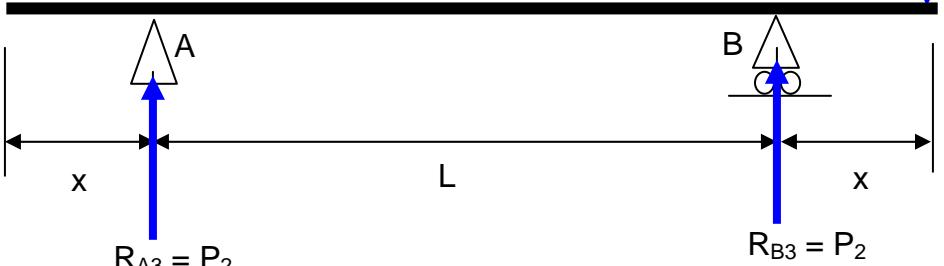
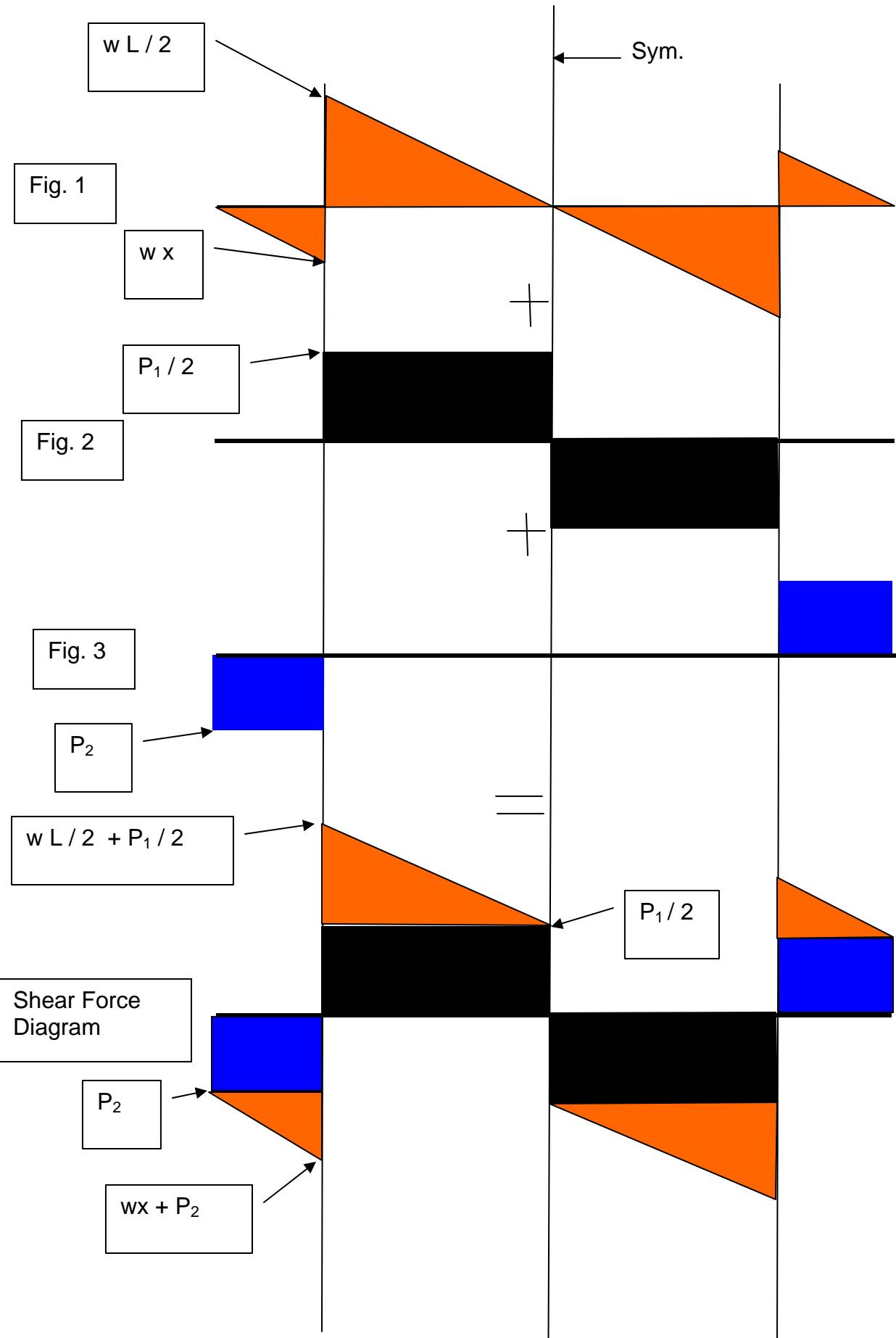
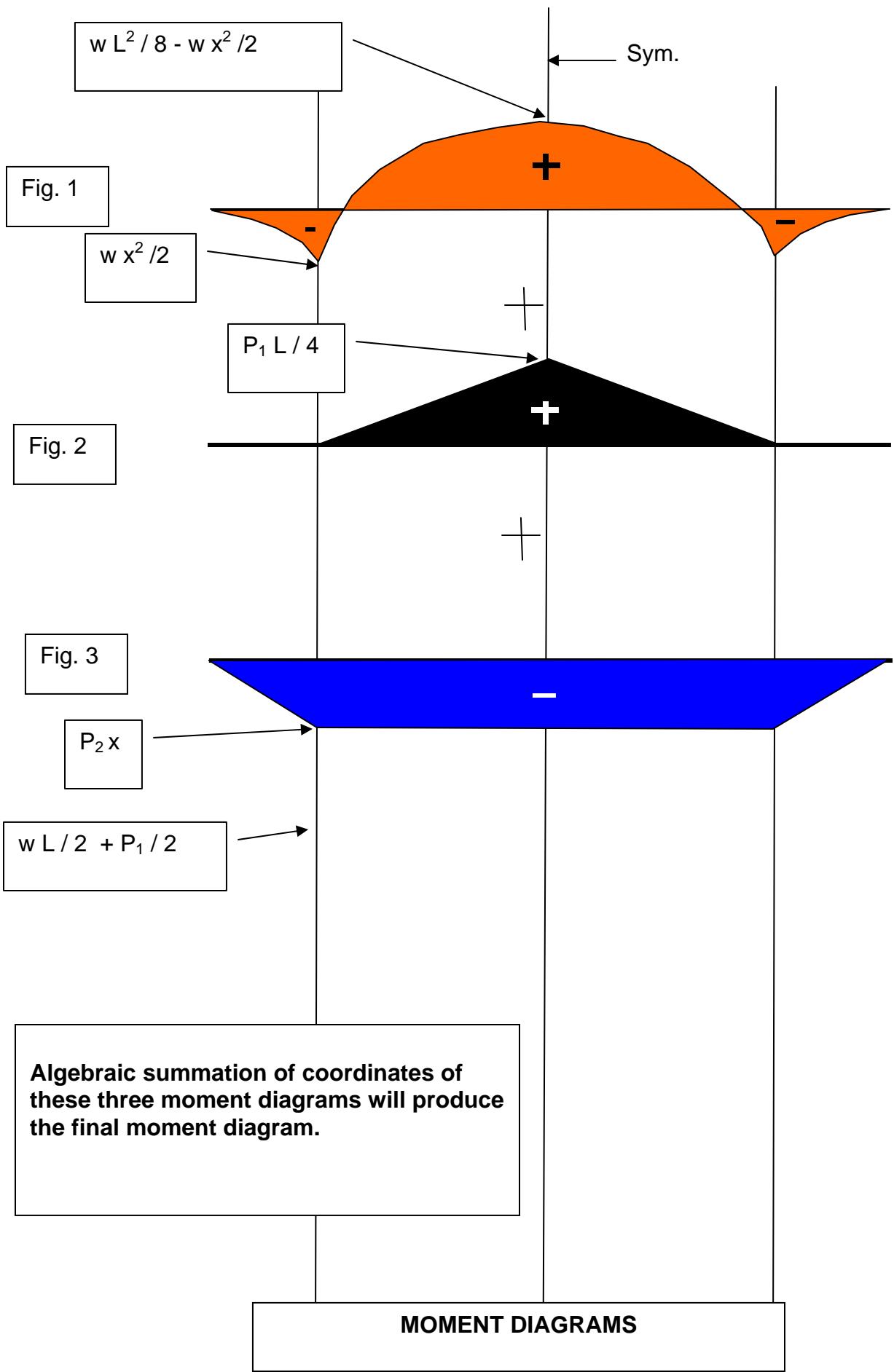


Fig. 3

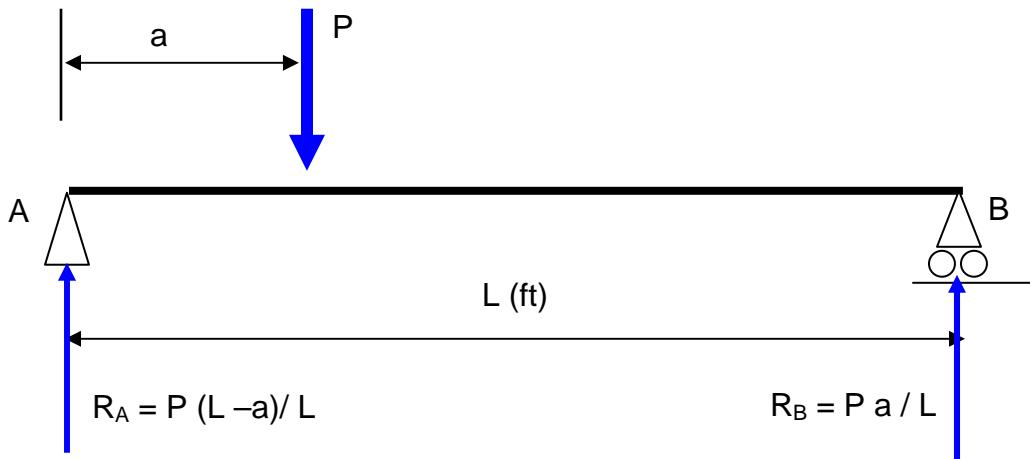




SHEAR FORCE DIAGRAMS



EXAMPLE 3:



$$R_A = P(L - a) / L$$

SHEAR FORCE

$$R_B = Pa / L$$

$$\begin{aligned} M &= Pa(L - a) / L \\ &= Pa - Pa^2 / L \end{aligned}$$

MOMENT

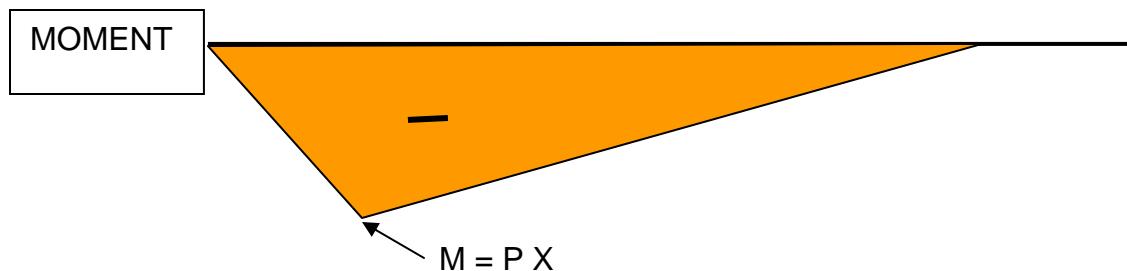
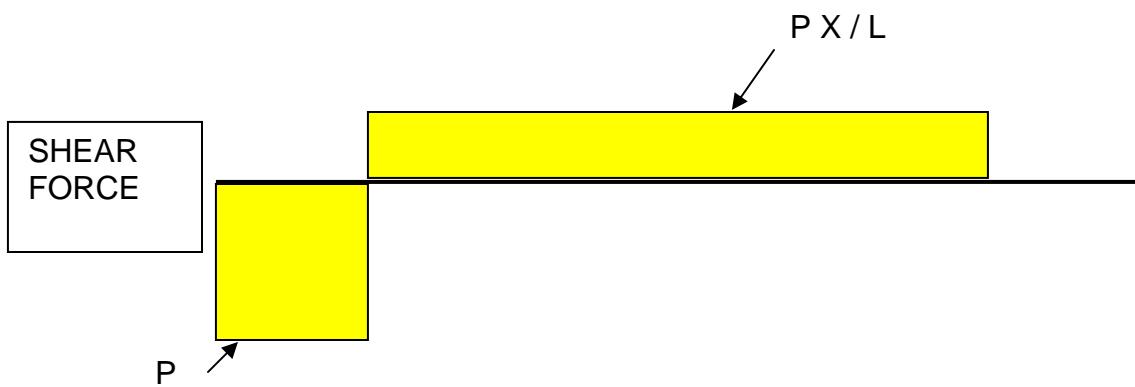
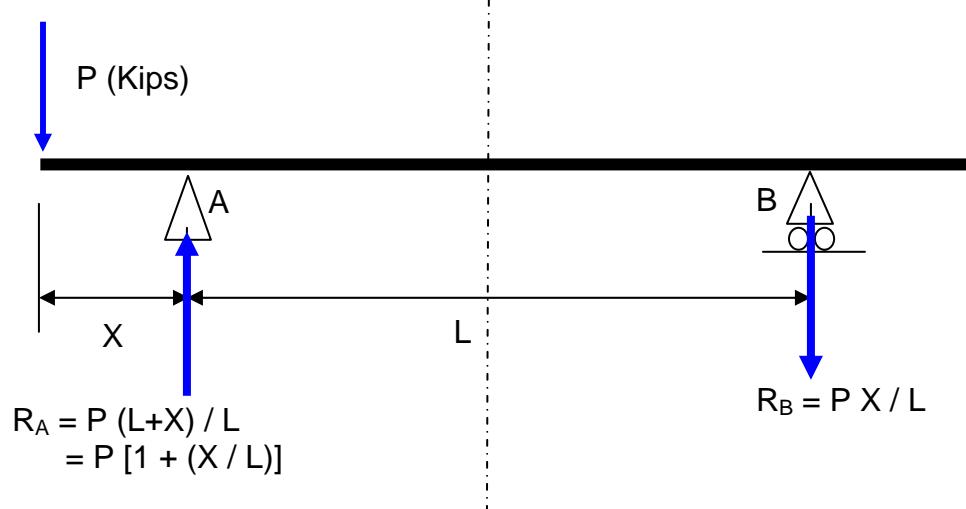


NOTE:

When $a = 0.5L$;

SHEAR FORCE at the mid-span = $P/2$
MOMENT at the mid-span = $PL/4$

Example 4



Example 5

$$M = (w L^2 / 2) + (P_1 L) + (P_2 a)$$

P₂ (Kips)

P₁ (Kips)

$$R = w L + P_1 + P_2$$

w (kips/ft)

Fig 1. REACTION & MOMENT

$$R_1 = w L$$

1

P₁ (Kips)

**Fig 2.
REACTION
& MOMENT**

$$M_2 = P_1 L$$

1

**Fig 3.
REACTION
& MOMENT**

P₂ (Kips)

$$R_3 \equiv P_2$$

Fig 1.
SHEAR
FORCE

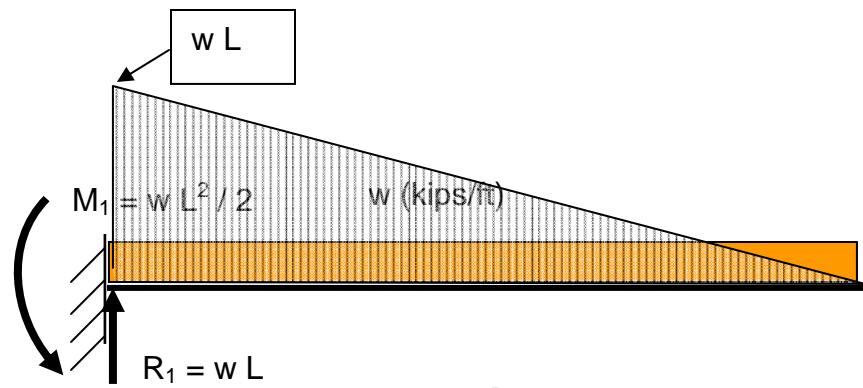


Fig 2.
SHEAR
FORCE

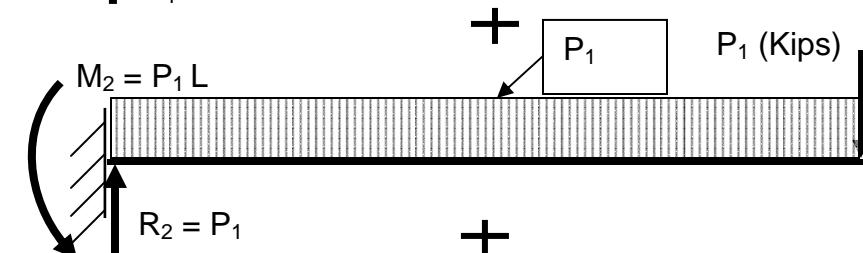
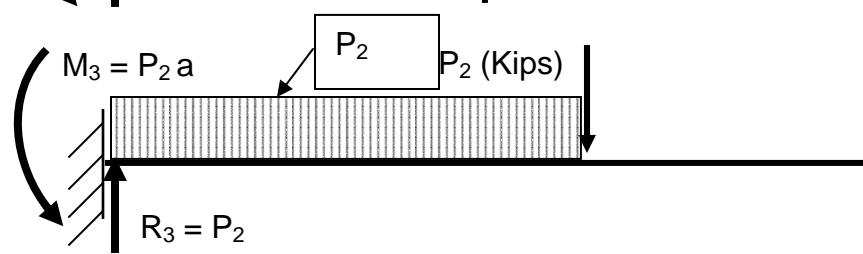


Fig 3.
SHEAR
FORCE



$$w L + P_1 + P_2$$

=

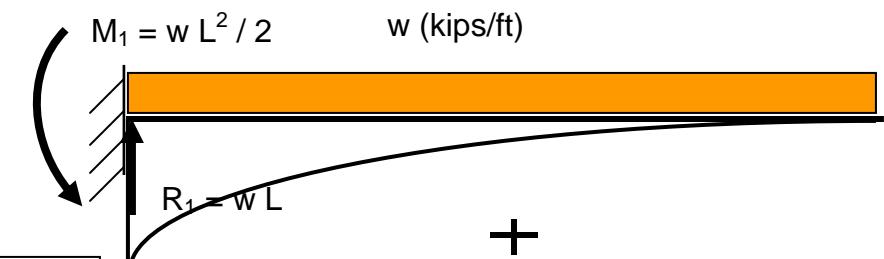
$$w (L-a) + P_1 + P_2$$

$$w (L-a) + P_1$$

$$P_1$$

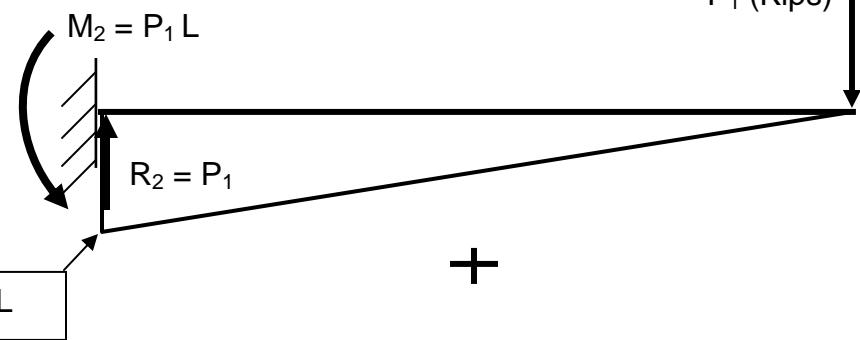
SHEAR FORCE DIAGRAM

Fig 1.
MOMENT



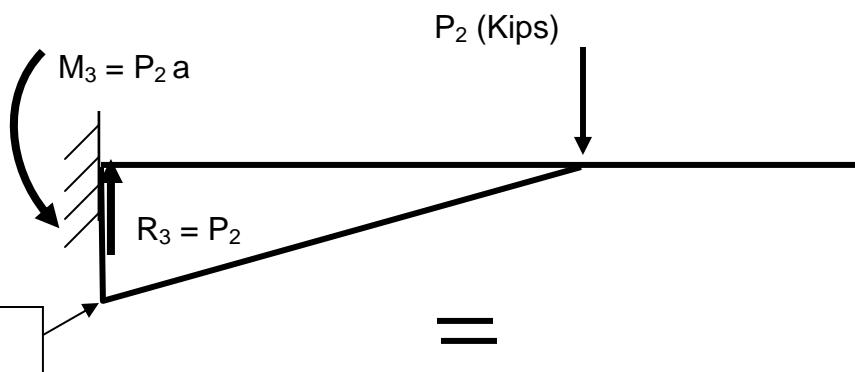
$$wL^2/2$$

Fig 2.
MOMENT



$$P_1 L$$

Fig 3.
MOMENT



$$P_2 a$$

$$[wL^2/2] + [P_1 L] + [P_2 a]$$

MOMENT DIAGRAM