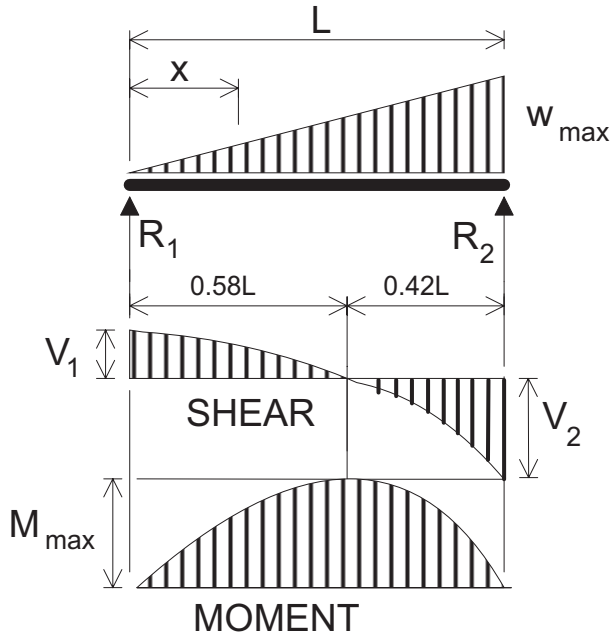


$$R_1 = V_1 = \frac{w_{max}}{3}$$

$$R_2 = V_2 = \frac{2w_{max}}{3}$$

$$V_x = \frac{w_{max}}{3} - \frac{w_{max}^{\ 2}}{L^2}$$

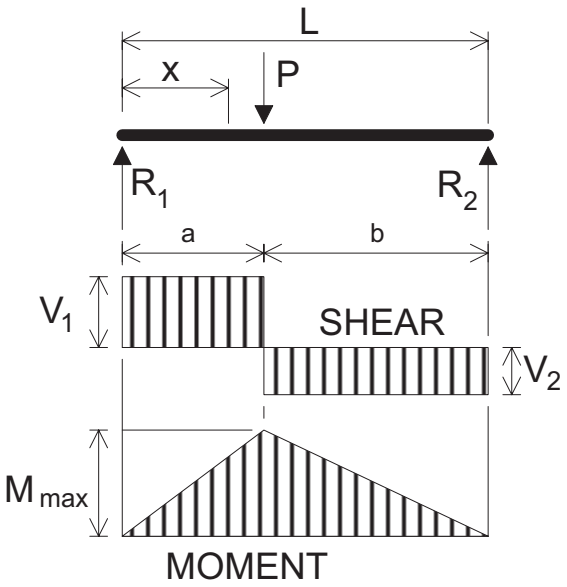
$$M_{max}\ (\text{at } x = \frac{L}{\sqrt{3}}) = \frac{2w_{max}L}{9\sqrt{3}}$$

$$M_x = \frac{w_{max}x}{3L^2}(L^2 - x^2)$$

$$\Delta_{max}\ (\text{at } x = L\sqrt{1-\sqrt{\frac{8}{15}}}) = \frac{w_{max}L^3}{77EI}$$

$$\Delta_x = \frac{w_{max}x}{180EIL^2}(3x^4 - 10L^2x^2 + 7L^4)$$

Figure A.4 - Simple Beam - Load Increasing Uniformly to One End



$R_1 = V_1$ (max when a<b) = $\frac{Pb}{L}$

$R_2 = V_2$ (max when a>b) = $\frac{Pa}{L}$

M_{max} (at point of load) = $\frac{Pab}{L}$

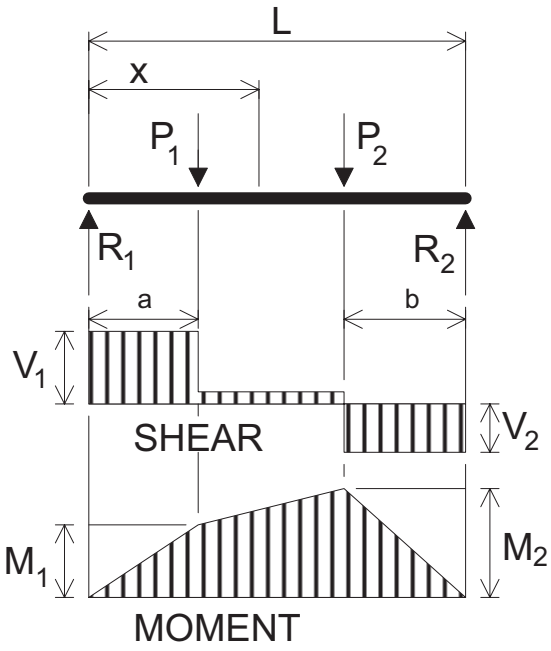
M_x (when x<a) = $\frac{Pbx}{L}$

Δ_{max} [at x = $\sqrt{\frac{a(a+2b)}{3}}$ when a<b] = $\frac{Fab(a+2b)\sqrt{3a(a+2b)}}{27EIL}$

Δ_a (at point of load) = $\frac{Pa^2b^2}{3EIL}$

Δ_x (when x<a) = $\frac{Pbx}{6EIL}(L^2 - b^2 - x^2)$

Figure A.5 - Simple Beam - Concentrated Load at Any Point



$$R_1 = V_1 = \frac{P_1 (L - a) + P_2 b}{L}$$

$$R_2 = V_2 = \frac{P_1 a + P_2 (L - b)}{L}$$

V_x [when $a<x<(L-b)$] = $R_1 - P_1$

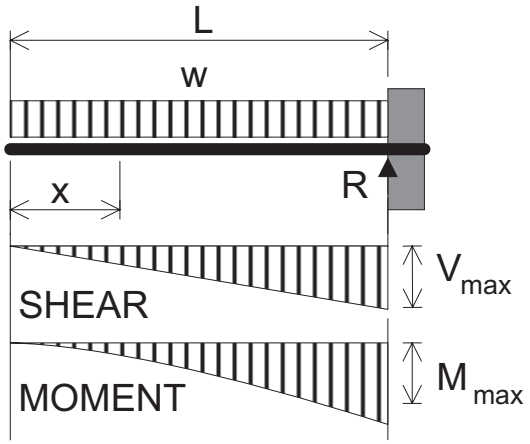
M_1 (max when $R_1<P_1$) = $R_1 a$

M_2 (max when $R_2<P_2$) = $R_2 b$

M_x (when $x<a$) = $R_1 x$

M_x [when $a<x<(L-b)$] = $R_1 x - P_1 (x-a)$

Figure A.6 - Simple Beam - Two Unequal Concentrated Loads Unsymmetrically Placed



$R = V_{max} = wL$

$V_x = wx$

M_{max} (at fixed end) = $\frac{wL^2}{2}$

$M_x = \frac{wx^2}{2}$

Δ_{max} (at free end) = $\frac{wL^4}{8EI}$

$\Delta_x = \frac{w}{24EI} (x^4 - 4L^3 x + 3L^4)$

Figure A.7 - Cantilever Beam - Uniformly Distributed Load