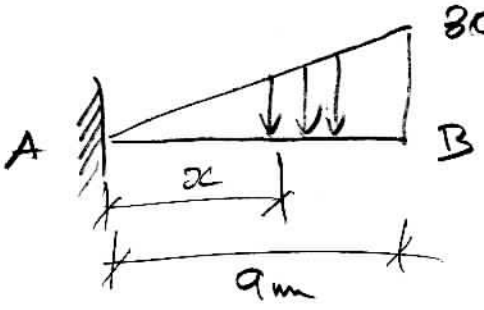
TE1-3.3



$q(x) = \frac{30}{9} x = \frac{10}{3} x$

$Q(x) = -\int q(x)\,dx$

$Q(x) = -\frac{10}{3}\frac{x^2}{2} + C_1$

$M(x) = \int Q(x)\,dx$

$M(x) = -\frac{10}{3}\frac{x^3}{6} + C_1 x + C_2$

$M_A = -30 \times 9 \times \frac{1}{2} \times \frac{2}{3} \times 9$

$M_A = -810$ kNm

$Q_A = -30 \times 9 \times \frac{1}{2} = +135$ kN

Para $Q(x=0) = 135$

Logo $C_1 = 135$

$Q(x) = -\frac{5}{3}x^2 + 135$

Para $M(x=0) = -810$ Logo $C_2 = -810$

$M(x) = -\frac{5}{9}x^3 + 135x - 810$

Alternativamente (p/ C_1 e C_2):

$Q(x=9) = 0 \quad -\frac{10}{3}\frac{9^2}{2} + C_1 = 0 \quad C_1 = \frac{10 \times 81}{6} = 135$

$M(x=9) = 0 \quad -\frac{10 \times 9^3}{3 \times 6} + 135 \cdot 9 + C_2 = 0$

$C_2 = \frac{10 \times 729}{18} - 135 \times 9 = -810$