EF. Octobre.

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1.1 Cdl.

$V(0) = 0$

$V(L) = Vd$

1.2 CAdS.

$V(0) = 0$

$V(L) = 0$

1.3 Fct de base CAdS.

$V_1(x) = x(x-L) \in CAdS$

$V_d(x) = \frac{x}{L} Vd \in CA$

1.4 $\pi d(u) = \frac{1}{2}\int_0^{2L} EI V''(x)^2 dx - \int_0^{2L} (-P) v(x) dx$

$= \frac{1}{2}\int_0^{2L} EI V''(x)^2 dx + \int_0^{2L} P v(x) dx$

1.5 $V(x) = Q V_1(x) + Vd(x)$ $\quad V_d''(x) = 0$

$V''(x) = Q V_1''(x) + V_d''(x)$ $\quad V_1''(x) = 2$

$V''(x) = Q\,2$

$\pi d(u) = \frac{1}{2}\int_0^{2L} EI\,4\,Q^2 dx + \int_0^{2L} P Q V_1(x) dx + \int_0^{2L} P Vd(x) dx$

$\delta \pi d(u) = 0$

$= 8EILQ\delta Q + P\left[\frac{1}{3}x^3 - Lx^2\right]_0^{2L}\delta Q$

$= \delta Q\left(8EILQ + \frac{P2L^3}{3}\right) = 0 \quad \forall \delta Q$

$\frac{8L^3}{3} - \frac{8L^3}{3}$

$\frac{2L^3}{3}$

$8EIL\,Q + \frac{P2L^3}{3} = 0$

1.6 Résultat $\quad Q = -\frac{PL^2}{12EI}$

$\frac{\frac{N}{m} \times m^3}{\frac{N}{m^2} \times m^4} = \frac{N \cdot m^2}{N \cdot m^2}$

1.7 $V(2L) = \frac{-PL^2}{12EI}\left(2L(2L-L)\right) + \frac{Vd\,2L}{L}$

$= \frac{-PL^2}{6EI}(L^2) + 2Vd$

$V(2L) = 2Vd - \frac{PL^4}{6EI}$

$V(x) = -\frac{PL^2}{12EI}\left(x(x-L)\right) + Vd\frac{x}{L}$