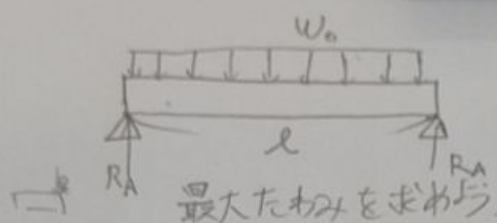


②



$$2R_A = w_0 l$$

$$R_A = \frac{w_0 l}{2}$$

$$W(x) = -w_0$$

$$Q(x) = -w_0 x + C_1$$

$$Q(0) = -w_0 \cdot 0 + C_1 = \frac{w_0 l}{2}$$

$$C_1 = \frac{w_0 l}{2}$$

$$Q(x) = -w_0 x + \frac{w_0 l}{2}$$

$$M(x) = -\frac{1}{2} w_0 x^2 + \frac{1}{2} w_0 l x + C_2$$

$$M(0) = 0$$

$$C_2 = 0$$

$$M(x) = -\frac{1}{2} w_0 x^2 + \frac{1}{2} w_0 l x$$

$$\theta(x) = -\frac{1}{EI} \left(-\frac{1}{6} w_0 x^3 + \frac{1}{4} w_0 l x^2 + C_3 \right)$$

$$\theta\left(\frac{l}{2}\right) = 0$$

$$-\frac{1}{EI} \left(-\frac{1}{6} w_0 \cdot \frac{1}{8} l^3 + \frac{1}{4} w_0 l \cdot \frac{1}{4} l^2 + C_3 \right) = 0$$

$$-\frac{1}{48} w_0 l^3 + \frac{1}{16} w_0 l^3 + C_3 = 0$$

$$C_3 = -\frac{1}{24} w_0 l^3$$

$$Q(x) = -\frac{1}{EI} \left(-\frac{1}{6} w_0 x^3 + \frac{1}{4} w_0 l x^2 - \frac{1}{24} w_0 l^3 \right)$$

$$V(x) = -\frac{1}{EI} \left(-\frac{1}{24} w_0 x^4 + \frac{1}{12} w_0 l x^3 - \frac{1}{24} w_0 l^3 x \right)$$

$$= \frac{w_0}{24 EI} (x^4 - 2 l x^3 + l^3 x)$$

$$f(x) = x^4 - 2 l x^3 + l^3 x \quad x \text{ が } < l$$

$$f'(x) = 4x^3 - 6 l x^2 + l^3$$

$$f''(x) = 12x^2 - 12 l x$$

$$= 12x(x - l)$$

$$f'(x) = 0$$

$$4x^3 - 6 l x^2 + l^3 = 0$$

$$(2x - l)^2 (2x^2 - 2 l x - l^2) = 0$$

$$x = \frac{l}{2}, \frac{1 \pm \sqrt{5}}{2} l$$

$$V\left(\frac{l}{2}\right) = \frac{5}{16} l^4$$

最大たわみ

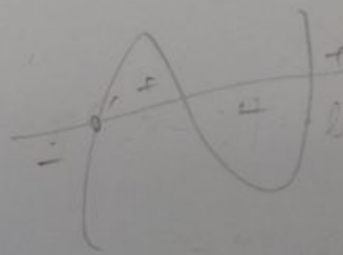
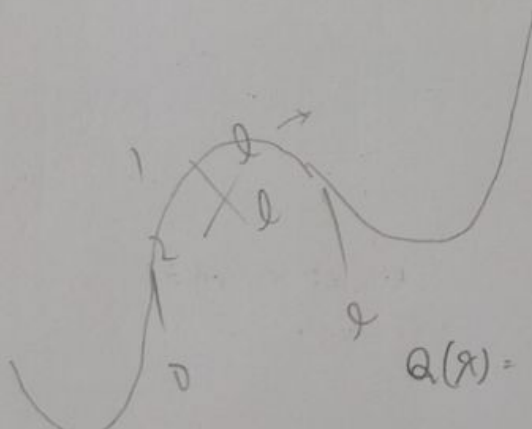
$$2x - l \quad \begin{array}{r} 2x^2 - 2lx - l^2 \\ 4x^3 - 6lx^2 + l^3 \\ \hline 4x^3 - 2xl \\ \hline -1lx^2 \\ -4lx + 2l^2 \\ \hline -2lx + l^2 \\ -2lx + l^2 \\ \hline -l^3 \end{array}$$

$$x = \frac{l \pm \sqrt{l^2 + 2l^2}}{2}$$

$$\frac{l \pm \sqrt{3}l}{2}$$

$$= \frac{(1 \pm \sqrt{3})l}{2}$$

$$2\left(x - \frac{l}{2}\right)^2 = \frac{l^2}{4} - l^2 = -\frac{3}{4}l^2$$



x	0	l/2	l	(1+sqrt(5))/2 * l
f(x)	0	+	0	+
f'(x)	+	+	0	+
f''(x)	+	+	0	+
f(x)	↑	↑	↓	↓