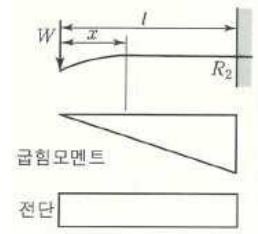
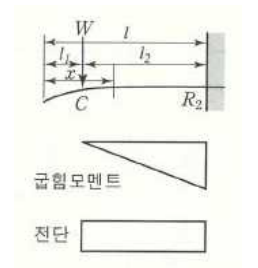
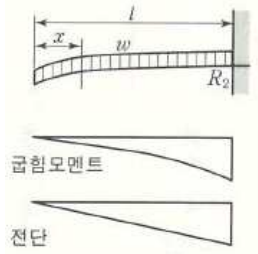
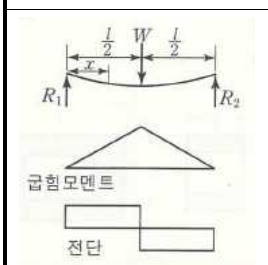
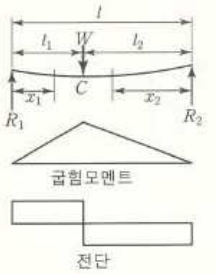
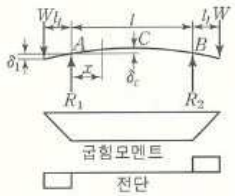
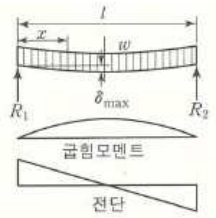
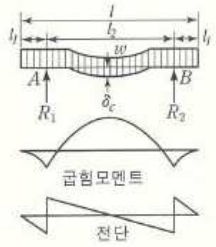
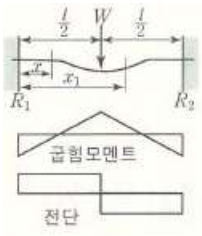
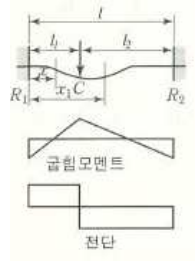
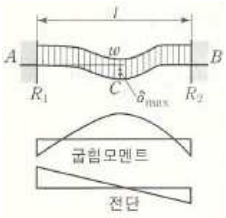
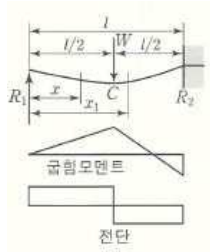
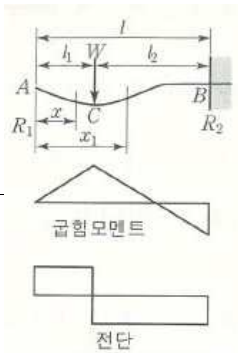
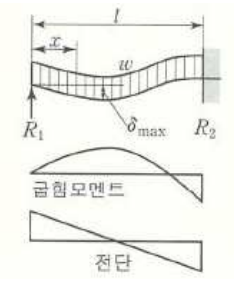
W = □ 중하중 kg	$\bar{W}$ =하중의 총 무게 kg	ω = □ 위길이당 무게 kg/cm
R = □ 력 kg	M = □ 힘모멘트 $cm \cdot kg$	δ = □ 짐량 cm
i = □ 사각 rad	E = □ 성계수 kg/cm^2	I = □ 면 2차 모멘트 cm^4
□ = □ 의 높이 cm	f_b = □ 대굽힘응력 kg/cm^2	

보의 종류	반력 및 굽힘모멘트	휨 및 경사각
	$R_2 = W$ $M_x = Wx$ $M_{max} = Wl$	$\delta_x = \frac{Wl^3}{3EI}\left(1 - \frac{3x}{2l} + \frac{x^3}{2l^3}\right)$ $\delta_{max} = \frac{Wl^3}{3EI} = \frac{2f_b l^2}{3Eh}$ (자유단에서) $i_x = \frac{Wl^2}{2EI}\left(1 - \frac{x^2}{l^2}\right)$ $i_{max} = \frac{Wl^2}{2EI} = \frac{3}{2l}\delta_{max}$ (자유단에서)
	$R_2 = W$ $M_x = W(x - l_1)$ $M_{max} = Wl_2$	$\delta_x = \frac{Wl_2^3}{3EI}\left\{1 - \frac{3(x-l_1)}{2l_2} + \frac{(x-l_1)^3}{2l_2^3}\right\}$ $\delta_c = \frac{Wl_2^3}{3EI}$ $\delta_{max} = \frac{Wl_2^2}{2EI}\left(1 + \frac{3l_1}{2l_2}\right)$(자유단에서) $i_x = \frac{Wl_2^2}{2EI}\left\{1 - \frac{(x-l_1)^2}{l_2^2}\right\}$ $i_{max} = \frac{Wl_2^2}{2EI}$ (C 점에서 자유단까지 균일)
	$R_2 = wl$ $M_x = \frac{wx^2}{2}$ $M_{max} = \frac{wl^2}{2}$	$\delta_x = \frac{wl^4}{8EI}\left(1 - \frac{4x}{3l} + \frac{x^4}{3l^4}\right)$ $\delta_{max} = \frac{wl^4}{8EI} = \frac{f_b l^2}{3Eh}$ (자유단에서) $i_x = \frac{wl^3}{6EI}\left(1 - \frac{x^3}{l^3}\right)$ $i_{max} = \frac{wl^3}{6EI} = \frac{4}{3l}\delta_{max}$ (자유단에서)
	$R_1 = R_2 = \frac{W}{2}$ $M_x = \frac{Wx}{2}$ $M_{max} = \frac{Wl}{4}$	$\delta_x = \frac{Wl^3}{48EI}\left(\frac{3x}{l} - \frac{4x^3}{l^3}\right)$ $\delta_{max} = \frac{Wl^3}{48EI} = \frac{f_b l^2}{6Eh}$ (중앙에서) $i_x = \frac{Wl^2}{16EI}\left(1 - \frac{4x^2}{l^2}\right)$ $i_{max} = \frac{Wl^2}{16EI} = \frac{3}{l}\delta_{max}$(양단에서)

<table>
<tr>
<td> 
</td>
<td>$R_1 = \frac{Wl_2}{l}$
$R_2 = \frac{Wl_1}{l}$
$M_{x1} = \frac{Wl_2 x_1}{l}$
$M_{x2} = \frac{Wl_1 x_2}{l}$
$M_{\max} = \frac{Wl_1 l_2}{l}$</td>
<td>$\delta_{x1} = \frac{Wl_1{}^2 l_2{}^2}{6EIl}\left(\frac{2x_1}{l_1} + \frac{x_1}{l_2} - \frac{x_1{}^3}{l_1{}^2 l_2}\right)$
$\delta_{x2} = \frac{Wl_1{}^2 l_2{}^2}{6EIl}\left(\frac{2x_2}{l_2} + \frac{x_2}{l_1} - \frac{x_2{}^3}{l_1 l_2{}^2}\right)$
$\delta_c = \frac{Wl_1{}^2 l_2{}^2}{3EIl}$
$l_1 > l_2$일 때 $\delta_{\max} = \frac{Wl_2}{3EIl}\left\{\frac{l_1(l+l_2)}{3}\right\}^{\frac{3}{2}}$
$\left[x_1 = l_1\sqrt{\frac{1}{3} + \frac{2l_2}{3l_1}}\text{ 에서}\right]$
$l_1 < l_2$일 때 $\delta_{\max} = \frac{Wl_2}{3EIl}\left\{\frac{l_2(l+l_1)}{3}\right\}^{\frac{3}{2}}$
$\left[x_2 = l_2\sqrt{\frac{1}{3} + \frac{2l_1}{3l_2}}\text{ 에서}\right]$</td>
</tr>
<tr>
<td> 
</td>
<td>$R_1 = R_2 = W$
$M_x = Wl_1$ (AB 사이 균일)</td>
<td>$\delta_x = \delta_c - \left\{\rho - \sqrt{\rho^2 - \left(\frac{1}{2} - x\right)^2}\right\}$
식에서 $\rho = \frac{EI}{Wl_1}$ = AB 사이의 곡률반경
$\delta_c = \frac{Wl^2 l_1}{8EI} = \frac{f_b l^2}{4Eh}$
$\delta_1 = \frac{Wl_1{}^2}{3EI}\left(l_1 + \frac{3l}{2}\right)$</td>
</tr>
<tr>
<td> 
</td>
<td>$R_1 = R_2 = \frac{wl}{2}$
$M_x = \frac{wx}{2}(1-x)$
$M_{\max} = \frac{wl^2}{8}$</td>
<td>$\delta_x = \frac{wl^4}{24EI}\left(\frac{x}{l} - \frac{2x^3}{l^3} + \frac{x^4}{l^4}\right)$
$\delta_{\max} = \frac{5wl^4}{384EI} = \frac{5f_b l^2}{24Eh}$
$i_x = \frac{wl^3}{24EI}\left(1 - \frac{6x^2}{l^2} + \frac{4x^3}{l^3}\right)$
$i_{\max} = \frac{wl^3}{24EI} = \frac{3.2}{l}\delta_{\max}$ (양끝에서)</td>
</tr>
<tr>
<td> 
</td>
<td>$R_1 = R_2 = \frac{wl}{2}$
$M_x = \frac{w}{2}\{x(l_2 - x) - l\,l_1\}$
$M_A = M_B = \frac{w\,l_1{}^2}{2}$
$M_C = \frac{wl^2}{2}\left(\frac{1}{4} - \frac{l_1}{l}\right)$
$l_1 > \left(\sqrt{\frac{1}{2}} - \frac{1}{2}\right)l$ 일 때 $M_A M_B$최대
$l_1 \leqq \left(\sqrt{\frac{1}{2}} - \frac{1}{2}\right)l$일 때 M_C최대</td>
<td>$\delta_x = \frac{w}{24EI}\{l_2(l_2{}^2 - 6l_1{}^2)x + 6l_1{}^2 x^2 - 2l_2 x^3 + x^4\}$
$\delta_c = \frac{w\,l_2{}^2}{384EI}(5l_2{}^2 - 24l_1{}^2)$</td>
</tr>
</table>

	$R_1 = R_2 = \frac{W}{2}$ $M_x = \frac{Wl}{2}\left(\frac{x}{l} - \frac{1}{4}\right)$ $M_{x1} = \frac{Wl}{2}\left(\frac{x_1}{l} - \frac{3}{4}\right)$ $M_{\max} = \frac{Wl}{8}$	$\delta_x = \frac{Wl^3}{16EI}\left(\frac{x^2}{l^2} - \frac{4x^3}{3l^3}\right)$ $\delta_{\max} = \frac{Wl^3}{192EI} = \frac{f_b l^2}{12Eh}$ (중앙에서) $i_x = \frac{Wl^2}{8EI}\left(\frac{x}{l} - \frac{2x^2}{l^2}\right)$
	$R_1 = \frac{Wl_2^2(3l_1 + l_2)}{l^3}$ $R_2 = \frac{Wl_2^2(l_1 + 3l_2)}{l^3}$ $M_A = \frac{Wl_1l_2^2}{l^2}$, $M_B = \frac{Wl_1^2l_2}{l^2}$ $M_x = -\frac{Wl_1l_2^2}{l^2} + \frac{Wl_2^2x(3l_1 + l_2)}{l^3}$ $M_{x1} = \frac{Wl_1^2(l_1 + 2l_2)}{l^2}$ $-\frac{Wl_1^2x_1(l_1 + 3l_2)}{l^3}$, $M_C = \frac{2Wl_1^2l_2^2}{l^3}$	$\delta_x = \frac{Wl_2^2x^2}{6EIl}\left\{\frac{3l_1}{l} - \frac{(3l_1 + l_2)x}{l^2}\right\}$ $\delta_{x1} = \frac{Wl_2^2x_1^2}{6EIl}\left\{\frac{3l_1}{l} - \frac{(3l_1 + l_2)x_1}{l^2}\right\}$ $+ \frac{W(x_1 - l_1)^3}{6EI}$ $\delta_c = \frac{Wl_1^3l_2^3}{3EIl^3}$ $l_1 < l_2$ 일 때 $x = \frac{l^2}{l_1 + 3l_2}$ 에서 $\delta_{\max} = \frac{2Wl_1^3l_2^2}{3EI(3l_1 + l_2)^2}$ $l_1 < l_2$ 일 때 $x = \frac{l^2}{l_1 + 3l_2}$ 에서 $\delta_{\max} = \frac{2Wl_1^2l_2^3}{3EI(l_1 + 3l_2)}$
	$R_1 = R_2 = \frac{wl}{2}$ $M_x = \frac{wl^2}{2}\left(-\frac{1}{6} + \frac{x}{l} - \frac{x^2}{l^2}\right)$ $M_A = M_B = \frac{wl^2}{12}$ $M_C = \frac{wl^2}{24}$	$\delta_y = \frac{wl^4}{24EI}\left(\frac{x^2}{l^2} - \frac{2x^3}{l^3} + \frac{x^4}{l^4}\right)$ $\delta_{\max} = \frac{wl^4}{384EI}$

	$R_1=\frac{5W}{16}$ $R_2=\frac{11W}{16}$ $M_x=\frac{5Wx}{16}$ $M_C=\frac{5Wl}{32}$ $M_{x1}=Wl\left(\frac{1}{2}-\frac{11x_1}{16l}\right)$ $M_{max}=\frac{3Wl}{16}$	$\delta=\frac{Wl^3}{32EI}\left(\frac{x}{l}-\frac{5x^3}{3l^3}\right)$ $\delta_{x1}=\frac{Wl^3}{32EI}\left(-\frac{2}{3}+\frac{5x_1}{l}-\frac{8x_1^2}{l^2}+\frac{11x_1^3}{3l^3}\right)$ $\delta_c=\frac{7Wl^3}{768EI}$ $\delta_{max}=\sqrt{\frac{1}{5}}\cdot\frac{Wl^3}{48EI}\left[x=l\sqrt{\frac{1}{5}}\text{ 에서}\right]$
	$R_1=\frac{Wl_2^2}{2l^3}(3l_1+2l_2)$ $R^2=\frac{Wl_1}{2l^3}(2l_1^3+6l_1l_2+3l_2^2)$ $M_x=\frac{Wl_2^2(3l_1+2l_2)x}{2l^3}$ $M_{x1}=\frac{Wl_2^2}{2l^3}(3l_1+2l_2)x_1-W(x_1-l_1)$ $M_B=\frac{Wl_1l_2}{2l^2}(2l_1+l_2)$ $M_C=\frac{Wl_1l_2^2}{2l^3}(3l_1+2l_2)$	$\delta_x=\frac{Wl_2^2}{12EI}\left\{\frac{3l_1x}{l}-\frac{(3l_1+2l_2)x^3}{l^3}\right\}$ $\delta_{x1}=\frac{Wl_2^2}{12EI}\left\{\frac{3l_1x_1}{l}-\frac{(3l_1+2l_2)x_1^3}{l^3}\right\}+\frac{W(x_1-l_1)^3}{6EI}$ $\delta_c=\frac{Wl_1^2l_2^3(4l_1+3l_2)}{12EIl^3}$ δ_{max}의 위치는 $l_2=\sqrt{2}\,l_1$일 때 $x=l_1$
	$R_1=\frac{3}{8}wl$ $R_2=\frac{5}{8}wl$ $M_x=\frac{wlx}{2}\left(\frac{3}{4}-\frac{x}{l}\right)$ $M_{max}=\frac{wl^2}{8}$ (고정단에서)	$\delta_x=\frac{wl^4}{48EI}\left(\frac{x}{l}-\frac{2x^3}{l^3}+\frac{2x^4}{l^4}\right)$ $\delta_{max}\fallingdotseq\frac{wl^4}{185EI}$ [$x=0.4215l$ 에서]