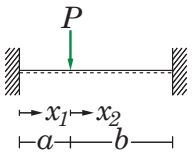
Tabelle A.34.: Beidseitig eingesp. Einfeldträger mit var. Punktlast



Randwerte:

$V_{10} = \frac{Pb^2(b+3a)}{(a+b)^3}$ `V10:P*b^2*(b+3*a)/(a+b)^3`

$M_{10} = \frac{-Pab^2}{(a+b)^2}$ `M10:-P*a*b^2/(a+b)^2`

$\varphi_{10} = 0$ `phi10:0`

$w_{10} = 0$ `w10:0`

$V_{20} = \frac{-Pa^2(a+3b)}{(a+b)^3}$ `V20:-P*a^2*(a+3*b)/(a+b)^3`

$M_{20} = \frac{2Pa^2b^2}{(a+b)^3}$ `M20:2*P*a^2*b^2/(a+b)^3`

$\varphi_{20} = \frac{-Pa^2b^2(b-a)}{2EI(a+b)^3}$ `phi20:-P*a^2*b^2*(b-a)/(2*EI*(a+b)^3)`

$w_{20} = \frac{P(a^3+b^3)}{3EI(a+b)^3}$ `w20:P*a^3*b^3/(3*EI*(a+b)^3)`

Auflagerkräfte:

$A = V_{10} = \frac{Pb^2(b+3a)}{(a+b)^3}$ `A:V10:P*b^2*(b+3*a)/(a+b)^3`

$B = -V_{20} = \frac{Pa^2(a+3b)}{(a+b)^3}$ `B:P*a^2*(a+3*b)/(a+b)^3`

Funktionsgleichungen:

$V(x_1) = V_{10} = \frac{Pb^2(b+3a)}{(a+b)^3}$ `Vx1:P*b^2*(b+3*a)/(a+b)^3`

$M(x_1) = \frac{Pb^2(bx_1+3ax_1-ab-a^2)}{(a+b)^3}$ `Mx1:P*b^2*(b*x1+3*a*x1-a*b-a^2)/(b+a)^3`

$\varphi(x_1) = \frac{Pb^2x_1(bx_1+3ax_1-2ab-2a^2)}{2EI(a+b)^3}$ `phix1:P*b^2*x1*(b*x1+3*a*x1-2*a*b-2*a^2)/(2*EI*(a+b)^3)`

$w(x_1) = \frac{-Pb^2x_1^2(bx_1+3ax_1-3ab-3a^2)}{6EI(a+b)^3}$ `wx1:-P*b^2*x1^2*(b*x1+3*a*x1-3*a*b-3*a^2)/(6*EI*(a+b)^3)`

$V(x_2) = \frac{-Pa^2(a+3b)}{(a+b)^3}$ `Vx2:-P*a^2*(a+3*b)/(a+b)^3`
$M(x_2) = \frac{-Pa^2(3bx_2+ax_2-2b^2)}{(a+b)3}$ `Mx2:-P*a^2*(3*b*x2+a*x2-2*b^2)/(b+a)^3`
$\varphi(x_2) = \frac{-Pa^2(x_2-b)(3bx_2+ax_2-b^2+ab)}{2EI(a+b)^3}$ `phix2:-P*a^2*(x2-b)*(3*b*x2+a*x2-b^2+a*b)/(2*EI*(a+b)^3)`
$w(x_2) = \frac{Pa^2(x_2-b)^2(3bx_2+ax_2+2ab)}{6EI(a+b)^2}$ `wx2:P*a^2*(x2-b)^2*(3*b*x2+a*x2+2*a*b)/(6*EI*(a+b)^3)`
Extremwerte:
$M_{max_{Einsp,li}} = M(x_1 = 0) = M_{10} = \frac{-Pab^2}{(a+b)^2}$ `MmaxEinspLi:-P*a*b^2/(a+b)^2`
$M_{max_{Feld}} = M(x_1 = a) = M_{20} = \frac{2Pa^2b^2}{(a+b)^3}$ `MmaxFeld:2*P*a^2*b^2/(a+b)^3`
$M_{max_{Einsp,re}} = M(x_2 = b) = \frac{-Pa^2b}{(a+b)^2}$ `MmaxEinspRe:-P*a^2*b/(b+a)^2`
Wenn $a \geq b$ **, dann liegt** w_{max} **in Bereich 1**
$x_{w,max_1} = \frac{2ab+2a^2}{3a+b}$ `xwmax1:(2*a*b+2*a^2)/(3*a+b)`
$w_{max,1} = \frac{2Pa^3b^2}{3EI(3a+b)^2}$ `wmax1:2*P*a^3*b^2/(3*EI*(3*a+b)^2)`
Wenn $a \leq b$ **, dann liegt** w_{max} **in Bereich 2**
$x_{w,max_2} = \frac{b^2-a*b}{a+3b}$ `xwmax2:(b^2-a*b)/(3*b+a)`
$w_{max,2} = \frac{2Pa^2b^3}{3EI(a+3b)^2}$ `wmax2:2*P*a^2*b^3/(3*EI*(a+3*b)^2)`