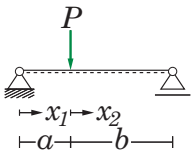
Tabelle A.1.: Einfeldträger mit var. Punktlast



Randwerte:

$V_{10} = \frac{Pb}{l}$ `V10:P*b/l`

$M_{10} = 0$ `M10:0`

$\varphi_{10} = \frac{-P(2ab^2+a^2b)}{6lEI}$ `phi10:-P*(2*a*b^2+a^2*b)/(6*l*EI)`

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

$V_{20} = \frac{-Pa}{l}$ `V20:-P*a/l`

$M_{20} = \frac{Pab}{l}$ `M20:P*a*b/l`

$\varphi_{20} = \frac{-P(2ab^2-2a^2b)}{6lEI}$ `phi20:-P*(2*a*b^2-2*a^2*b)/(6*l*EI)`

$w_{20} = \frac{Pa^2b^2}{3lEI}$ `w20:P*a^2*b^2/(3*l*EI)`

Auflagerkräfte:

$A = \frac{Pb}{l}$ `A:P*b/l`

$B = \frac{Pa}{l}$ `B:P*a/l`

Funktionsgleichungen:

$V(x_1) = \frac{Pb}{l}$ `Vx1:P*b/l`

$M(x_1) = \frac{Pbx_1}{l}$ `Mx1:P*b*x1/l`

$\varphi(x_1) = \frac{P(3bx_1^2-2ab^2-a^2b)}{6lEI}$ `phix1:P*(3*b*(x1^2)-2*a*(b^2)-(a^2)*b)/(6*l*EI)`

$w(x_1) = \frac{-Pbx_1(x_1^2-2ab-a^2)}{6lEI}$ `wx1:-P*b*x1*(x1^2-2*a*b-a^2)/(6*l*EI)`

$V(x_2) = \frac{-Pa}{l}$ `Vx2:-P*a/l`
$M(x_2) = \frac{-Pba}{l}(\frac{x_2}{b} - 1)$ `Mx2:-P*b*a/l*(x2/b-1)`
$\varphi(x_2) = \frac{-P(3ax_2^2-6abx_2+2ab^2-2a^2b)}{6lEI}$ `phix2:-P*(3*a*x2^2-6*a*b*x2+2*a*b^2-2*a^2*b)/(6*l*EI)`
$w(x_2) = \frac{Pa(x_2-b)(x_2^2-2bx_2-2ab)}{6lEI}$ `wx2:P*a*(x2-b)*(x2^2-2*b*x2-2*a*b)/(6*l*EI)`
Extremwerte:
$x_{M,max} = a$ `xMmax:a`
$M_{max} = \frac{Pab}{l}$ `Mmax:P*a*b/l`
Wenn a ≥ b, dann liegt w_{max} in Bereich 1
$x_{w,max_1} = \frac{\sqrt{a}\sqrt{a+2b}}{\sqrt{3}}$ `xwmax1:sqrt(a)*sqrt(a+2*b)/sqrt(3)`
$w_{max,1} = \frac{Pa^{3/2}b(2b+a)^{3/2}}{3^{5/2}lEI}$ `wmax1:P*a^(3/2)*b*((2*b+a)^(3/2))/(3^(5/2)*l*EI)`
Wenn a ≤ b, dann liegt w_{max} in Bereich 2
$x_{w,max_2} = b - \frac{\sqrt{2ab+b^2}}{\sqrt{3}}$ `xwmax2:b-sqrt(2*a*b+(b*b))/sqrt(3)`
$w_{max,2} = \frac{Pab(b+2a)\sqrt{b(b+2a)}}{3^{5/2}lEI}$ `wmax2:(P*a*b*(b+2*a)*sqrt(b*(b+2*a)))/(3^(5/2)*l*EI)`