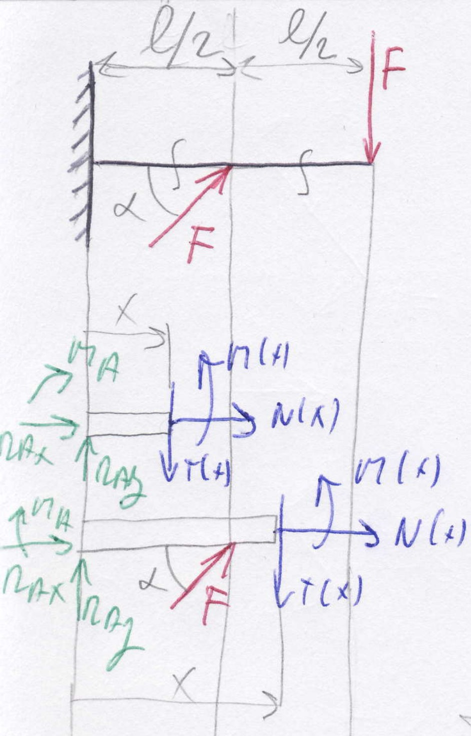
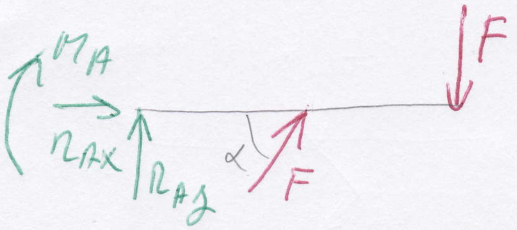


D: $l, F, \alpha = 30°$

U: VSU



$$x:\ R_{Ax} + F\cos\alpha = 0 \Rightarrow R_{Ax} = -F\cos\alpha = \frac{-\sqrt{3}}{2}F$$

$$z:\ R_{Az} + F\sin\alpha - F = 0 \Rightarrow R_{Az} = F - F\sin\alpha = F - \frac{F}{2} = \frac{F}{2}$$

$$\curvearrowleft A:\ M_A - F\sin\alpha\cdot\frac{l}{2} + Fl = 0$$

$$\Rightarrow M_A = \frac{Fl}{4} - Fl = -\frac{3}{4}Fl$$

$$x \in \left\langle 0; \frac{l}{2} \right\rangle$$

$$N(x) = -R_{Ax} = \frac{\sqrt{3}}{2}F \quad (\text{konst})$$

$$T(x) = R_{Az} = \frac{F}{2} \quad (\text{konst})$$

$$M(x) = M_A + R_{Az}\cdot x = -\frac{3}{4}Fl + \frac{F}{2}x \quad (\text{LIN. FCE})$$

$$M(0) = -\frac{3}{4}Fl = M_A$$

$$M\left(\frac{l}{2}\right) = -\frac{1}{2}Fl$$

$$x \in \left\langle \frac{l}{2}; l \right\rangle$$

$$N(x) = -R_{Ax} - F\cos\alpha = \frac{\sqrt{3}}{2}F - \frac{\sqrt{3}}{2}F = 0$$

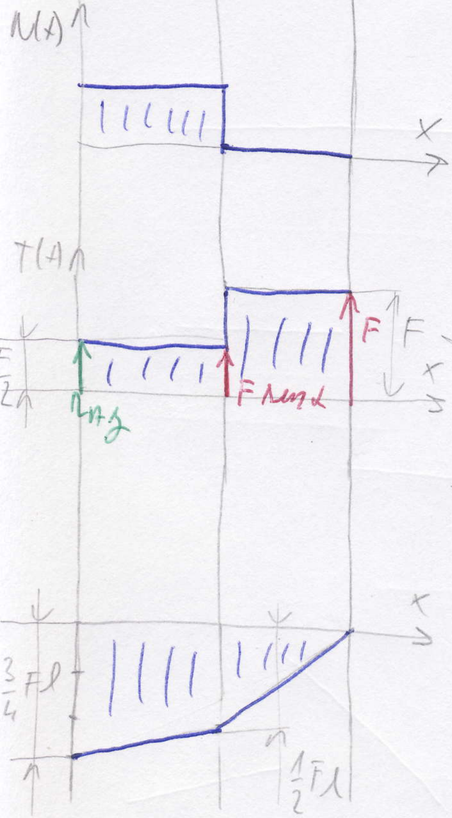
$$T(x) = R_{Az} + F\sin\alpha = \frac{F}{2} + \frac{F}{2} = F \quad (\text{konst})$$

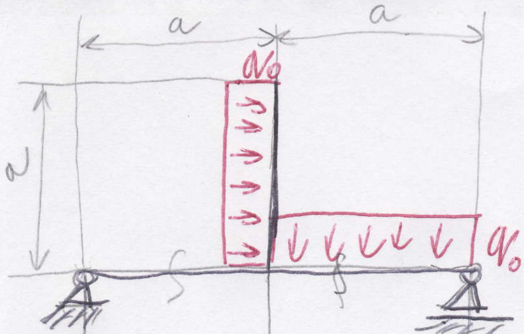
$$M(x) = R_{Az}\cdot x + F\sin\alpha\left(x - \frac{l}{2}\right) + M_A =$$

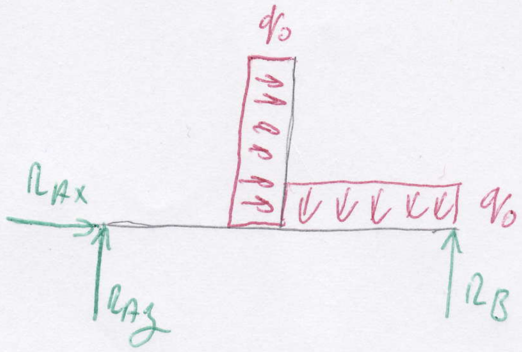
$$= \frac{F}{2}x + \frac{F}{2}x - \frac{F}{2}\cdot\frac{l}{2} - \frac{3}{4}Fl = Fx - Fl$$

$$M\left(\frac{l}{2}\right) = -\frac{1}{2}Fl$$

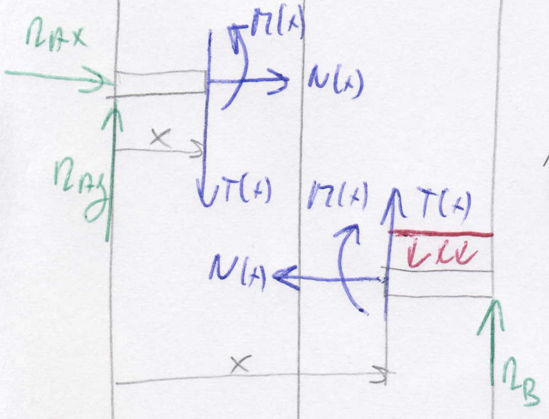
$$M(l) = 0$$







D: a, q_0,
U: VŠE



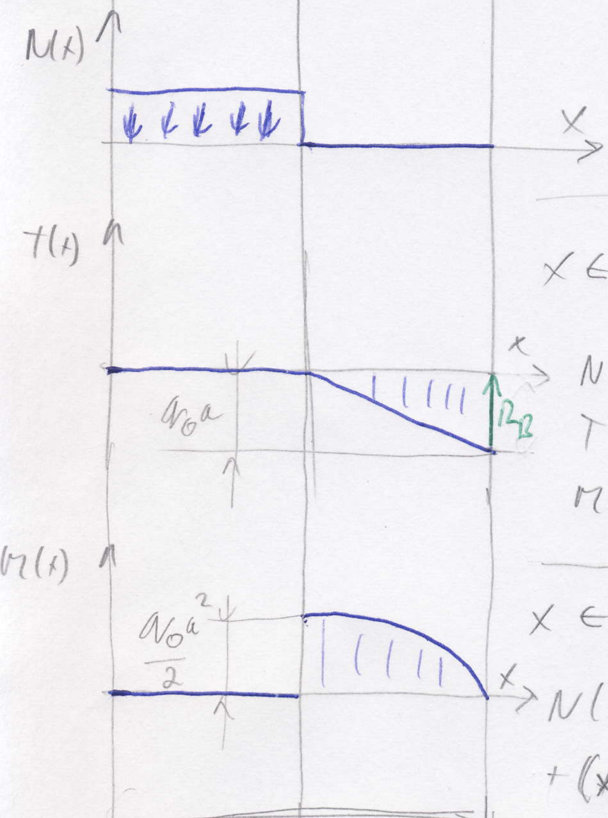
$\vec{x}$: $R_{Ax} + q_0 a = 0 \Rightarrow R_{Ax} = -q_0 a$

$\uparrow z$: $R_{Az} + R_B - q_0 a = 0$

$\curvearrowright A$: $q_0 a \cdot \frac{a}{2} + q_0 a \cdot \frac{3}{2} a - R_B \cdot 2a = 0 \Rightarrow$

$\Rightarrow R_B = q_0 a$

$R_{Az} = q_0 a - R_B = 0$



$x \in \langle 0, a)$

$N(x) = -R_{Ax} = q_0 a$ (KONST.)

$T(x) = R_{Az} = 0$

$M(x) = R_{Az} \cdot x = 0$

$x \in \langle 0, a\rangle$

$N(x) = 0$

$T(x) = q_0(2a - x) - R_B = 2q_0 a - q_0 x - q_0 a =$

$= q_0 a - q_0 x$ (LIN. FCE)

$T(a) = 0$, $T(2a) = -q_0 a$

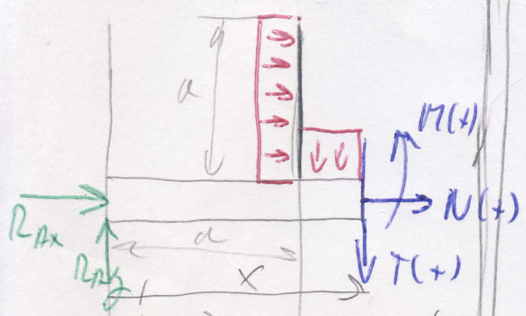
$M(x) = R_B \cdot (2a - x) - q_0(2a - x) \cdot \frac{2a - x}{2} =$

$= 2q_0 a^2 - q_0 a \cdot x - q_0 \frac{(2a - x)^2}{2}$ (PARABOLA 2. ST.)

$M(a) = q_0 a^2 - q_0 \frac{a^2}{2} = \frac{q_0 a^2}{2}$

$M(2a) = 0 - 0 = 0$

DRUHÝ ZPŮSOB ŘEZU 2



VÝPOČET DALŠÍ STR.

VÝPOČET K DRUHÉMU ZPŮSOBU PRO ŘEZ 2

$$N(x) = -R_{Ax} - q_0 a = q_0 a - q_0 a = 0$$

$$T(x) = R_{Ay} - q_0(x-a) = q_0 a - q_0 x$$

$$M(x) = R_{Ay} \cdot x - q_0(x-a)\frac{(x-a)}{2} + q_0 a \frac{1}{2} a = 0$$

ÚČINEK OD SVISLÉ TYČE ZATÍŽENÉ SPOJ. ZAT.

$$= 0 - \frac{q_0(x-a)^2}{2} + q_0 \frac{a^2}{2} = -\frac{q_0}{2}\left(x^2 - 2ax + a^2\right) + \frac{q_0}{2} a^2 =$$

$$= -\frac{q_0}{2} x^2 + q_0 a x$$

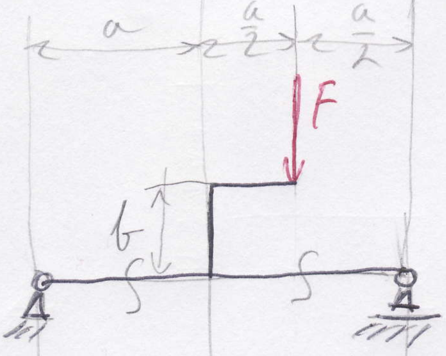
Z PŘEDCHOZÍHO VÝPOČTU:

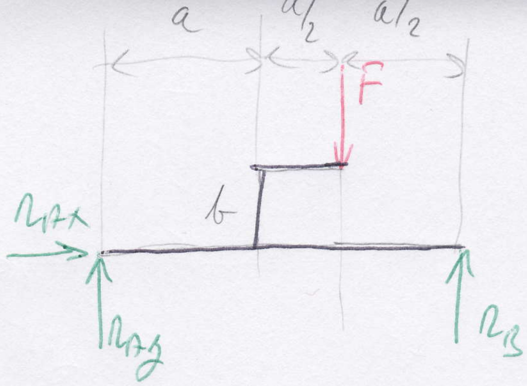
$$M(x) = 2q_0 a^2 - q_0 a x - q_0 \frac{(2a-x)^2}{2} = 2q_0 a^2 - q_0 a x - \frac{q_0}{2}\left(4a^2 - 4ax + x^2\right) =$$

$$= 2q_0 a^2 - q_0 a x - 2q_0 a^2 + 2q_0 a x - \frac{q_0}{2} x^2 =$$

$$= -\frac{q_0}{2} x^2 + q_0 a x$$

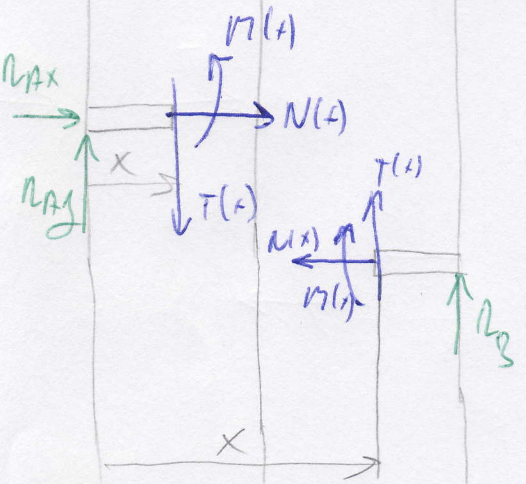
STEJNÉ ROVNICE PRO OBA ZPŮSOBY ŘEZU





D: F, a, b

V: VSÚ



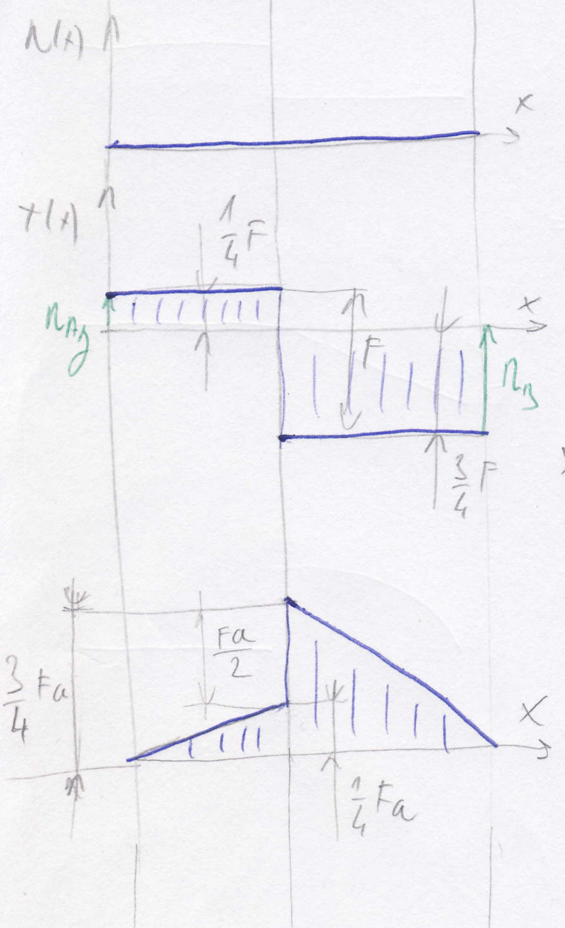
$x: \; R_{Ax} = 0$

$z: \; R_{Az} + R_B - F = 0$

$A\circlearrowleft: \; F \cdot \frac{3}{2} a - R_B \cdot 2a = 0 \Rightarrow$

$\Rightarrow R_B = \frac{3}{4} F$

$R_{Az} = F - \frac{3}{4} F = \frac{1}{4} F$



$x \in \langle 0; a \rangle$

$N(x) = 0$

$T(x) = R_{Az} = \frac{1}{4} F$ (konst.)

$M(x) = R_{Az} \cdot x = \frac{1}{4} F \cdot x$ (lin. fce) $M(0) = 0$, $M(a) = \frac{1}{4} Fa$

$x \in \langle a; 2a \rangle$

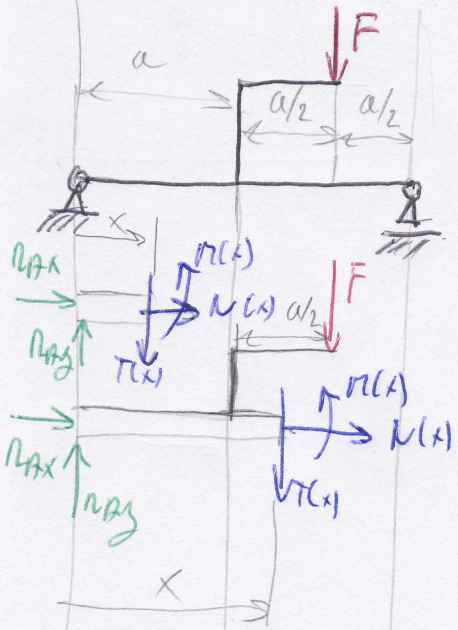
$N(x) = 0$

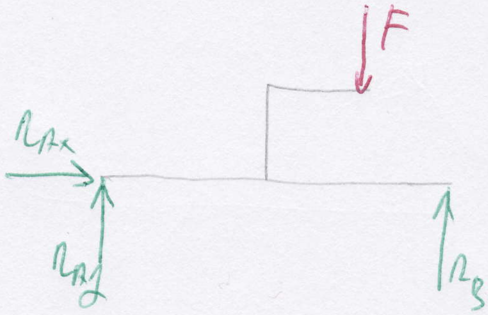
$T(x) = -R_B = -\frac{3}{4} F$ (konst.)

$M(x) = R_B \cdot (2a - x) = \frac{3}{2} Fa - \frac{3}{4} Fx$ (lin. fce)

$M(a) = \frac{3}{4} Fa^2$

$M(2a) = 0$



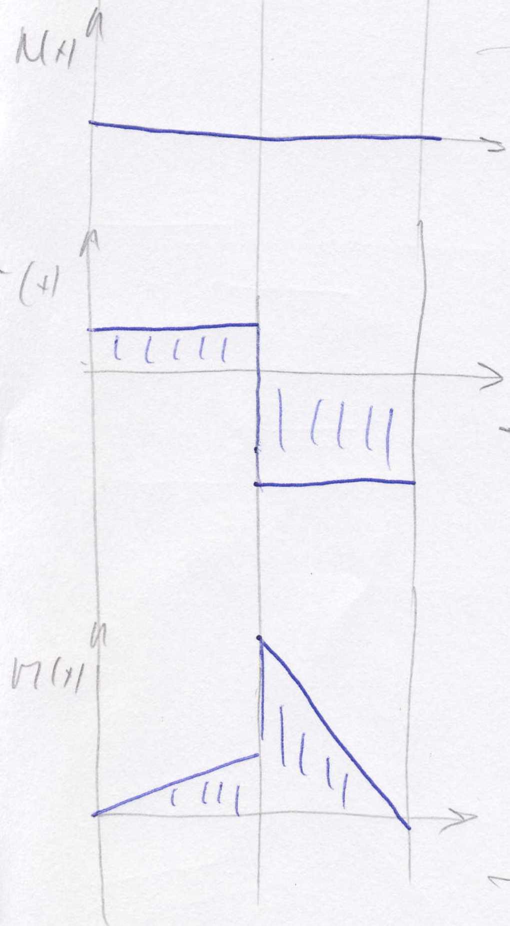


$x: R_{Ax} = 0$

$y: R_{Ay} + R_B - F = 0$

$A \curvearrowright \; F\frac{3}{2}a - R_B \cdot 2a = 0 \Rightarrow R_B = \frac{3}{4}F$

$R_{Ay} = \frac{1}{4}F$



$x \in \langle 0, a\rangle$

$N(x) = 0$

$T(x) = R_{Ay} = \frac{1}{4}F$

$M(x) = R_{Ay} \cdot x = \frac{1}{4}Fx \qquad M(0) = 0$

$M(a) = \frac{1}{4}Fa$

$x \in \langle a; 2a\rangle$

$N(x) = 0$

$T(x) = R_{Ay} - F = \frac{1}{4}F - F = -\frac{3}{4}F$

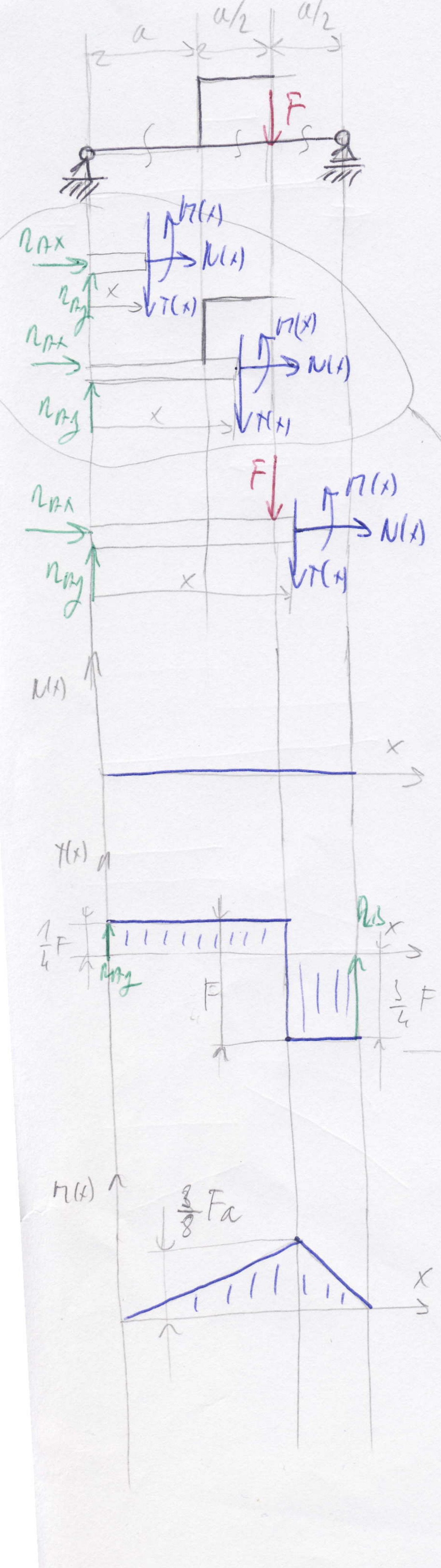
$M(x) = R_{Ay}x - F(x-a) + F\frac{a}{2} = \frac{1}{4}Fx - Fx + Fa + F\frac{a}{2} =$

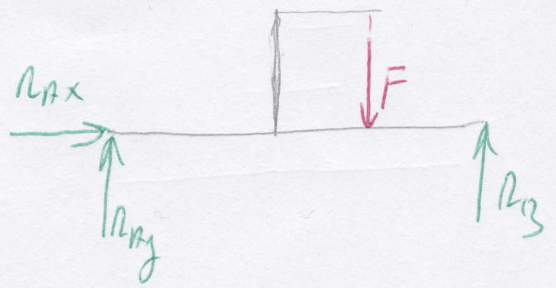
$= \frac{3}{2}Fa - \frac{3}{4}Fx$

OPĚT DRUHÝ ZPŮSOB ŘEZU JAKO V PŘÍKLADU NA DRUHÉ STRÁNCE

TAKÉ VYŠLY STEJNÉ FUNKCE

D: F, a,
U: VSÚ





x: $R_{Ax} = 0$

y: $R_{Ay} + R_B - F = 0$

$\curvearrowright A$: $F\cdot\frac{3}{2}a - R_B\cdot 2a \Rightarrow R_B = \frac{3}{4}F$

$R_{Ay} = F - \frac{3}{4}F = \frac{1}{4}F$

ZDÁNLIVĚ TO VYPADÁ STEJNĚ A VYŠLY BY STEJNÉ ROVNICE. NEPLATÍ TO VŠAK OBECNĚ. V TOMTO PŘÍPADĚ JE TO PROTO, PROTOŽE TO RAMENO NENÍ ZATÍŽENO. KDYBY BYLO, JE NUTNÉ TO RESPEKTOVAT. VIZ PŘÍKLAD VÝŠE.

$x \in \langle 0, \frac{3}{2}a \rangle$

$N(x) = -R_{Ax} = 0$

$T(x) = R_{Ay} = \frac{1}{4}F$ (konst)

$M(x) = R_{Ay}\cdot x = \frac{1}{4}F\cdot x$ (LIN FCE.)

$M(0) = 0, \quad M(a) = \frac{1}{4}Fa, \quad M(\frac{3}{2}a) = \frac{3}{8}Fa$

$x \in \langle \frac{3}{2}a ; 2a \rangle$

$N(x) = 0$

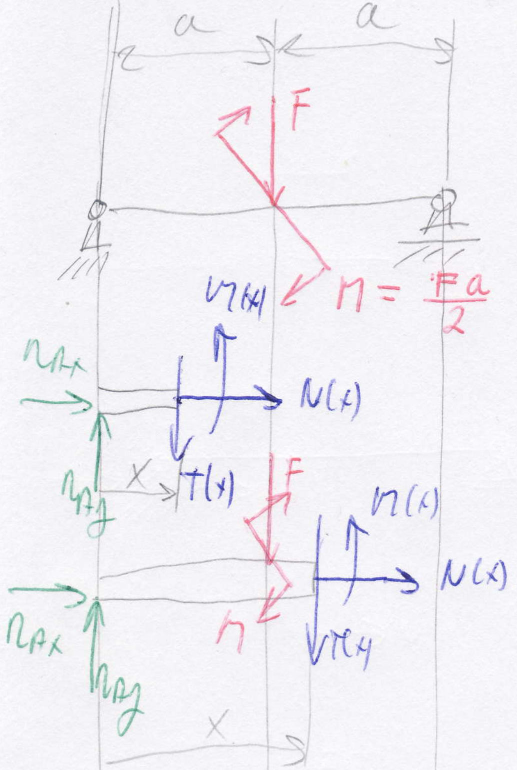
$T(x) = R_{Ay} - F = \frac{1}{4}F - F = -\frac{3}{4}F$

$M(x) = R_{Ay}x - F(x - \frac{3}{2}a) = \frac{1}{4}Fx - Fx + \frac{3}{2}Fa =$

$= \frac{3}{2}Fa - \frac{3}{4}Fx$

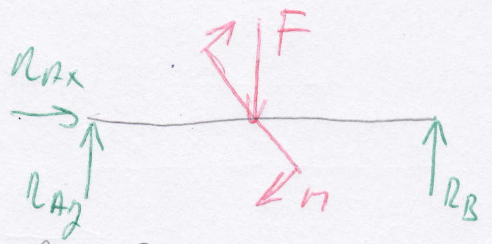
$M(\frac{3}{2}a) = \frac{3}{2}Fa - \frac{9}{8}Fa = \frac{3}{8}Fa$

$M(2a) = 0$



$D: F,\ a,\ M = \frac{Fa}{2}$

$U:$ VSÚ



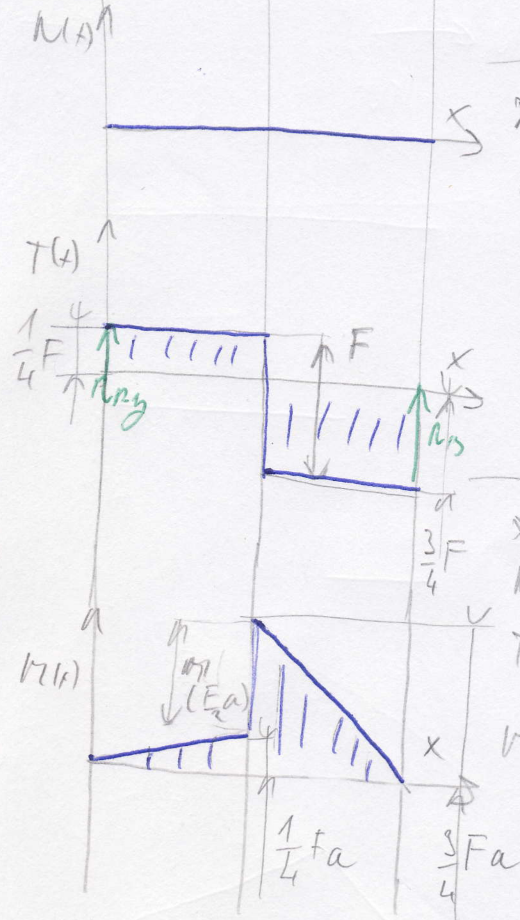
$x: \ R_{Ax} = 0$

$z: \ R_{Az} + R_B - F = 0$

$(A): \ Fa + M - R_B \cdot 2a = 0 \Rightarrow$

$$\Rightarrow R_B = \frac{Fa + M}{2a} = \frac{Fa + \frac{Fa}{2}}{2a} = \frac{3}{4}F$$

$$R_{Az} = F - \frac{3}{4}F = \frac{1}{4}F$$



$x \in \langle 0; a \rangle$

$N(x) = -R_{Ax} = 0$

$T(x) = R_{Az} = \frac{1}{4}F$ (KONST)

$M(x) = R_{Az} \cdot x = \frac{1}{4}Fx$ (LIN. FCE.)

$M(0) = 0, \ M(a) = \frac{1}{4}Fa$

$x \in \langle a; 2a \rangle$

$N(x) = 0$

$T(x) = R_{Az} - F = \frac{1}{4}F - F = -\frac{3}{4}F$ (KONST)

$$M(x) = R_{Az}x + M - F(x-a) = \frac{1}{4}Fx + \frac{Fa}{2} - Fx + Fa =$$

$$= \frac{3}{2}Fa - \frac{3}{4}Fx$$ (LIN FCE.)

$M(a) = \frac{3}{4}Fa \ ; \ M(2a) = 0$