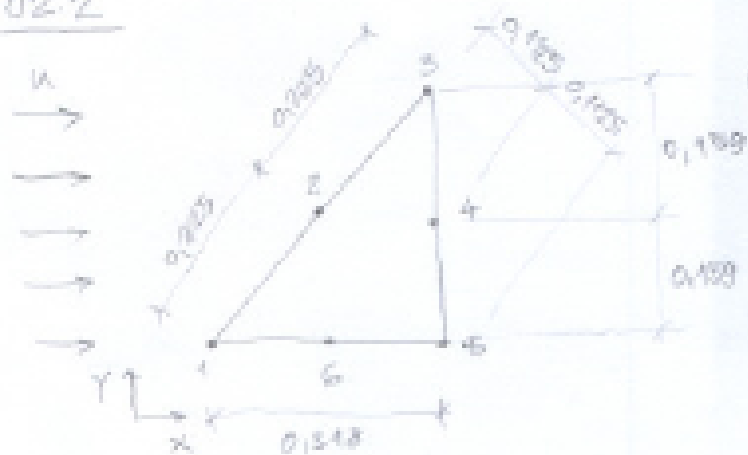


02.2



a)

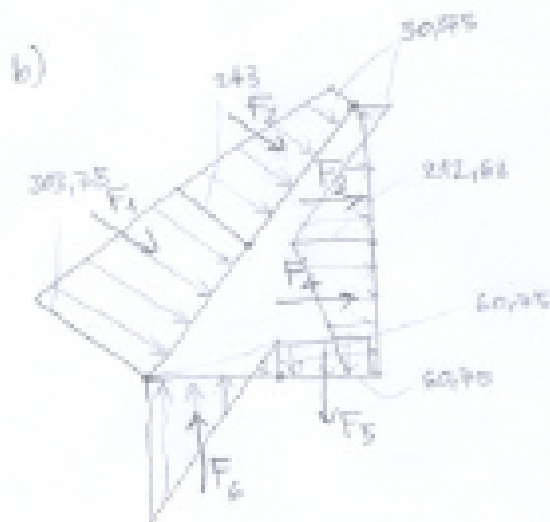
tlina	1	2	3	4	5	6
C_p	1,0	0,8	0,4	-0,4	-0,2	-0,2
F	303,75	243	30,75	-212,63	-60,75	-60,75

$$U = 22,5 \text{ m/s}$$

$$\rho = 1,2 \text{ kg/m}^3$$

$$F = C_p \cdot \frac{\rho}{2} U^2$$

$$F = C_p \cdot \frac{\rho}{2} \cdot 1,2 \cdot 22,5^2 = C_p \cdot 303,75$$



$$F_1 = \frac{303,75 + 243}{2} \cdot 0,225 = 61,509 \text{ N/m} \quad \checkmark$$

$$F_2 = \frac{243 + 30,75}{2} \cdot 0,225 = 30,75 \text{ N/m} \quad \checkmark$$

$$F_3 = \frac{212,63 - 30,75}{2} \cdot 0,159 = 14,489 \text{ N/m} \quad \checkmark$$

$$F_4 = \frac{212,63 + 60,75}{2} \cdot 0,159 = 21,73 \text{ N/m} \quad \checkmark$$

$$F_5 = \frac{2 \cdot 60,75}{2} \cdot 0,159 = 9,66 \text{ N/m} \quad \checkmark$$

$$F_6 = \frac{303,75 - 60,75}{2} \cdot 0,159 = 19,32 \text{ N/m} \quad \checkmark$$

$$F_x = \sin \alpha \cdot (F_1 + F_2) + F_3 + F_4$$

$$F_y = \cos \alpha \cdot (-F_1 - F_2) - F_5 + F_6$$

$$F_x = 0,707 \cdot (61,509 + 30,75) + 14,439 + 21,73 = 101,446 \text{ N/m} \quad \checkmark$$

$$F_y = 0,707 \cdot (-61,509 - 30,75) - 9,66 + 19,32 = -55,567 \text{ N/m} \quad \checkmark$$

$$C_{Fx} = \frac{F_x}{\frac{1}{2} \rho U^2 A_{\text{eff}}} = \frac{101,446}{\frac{1}{2} \cdot 1,2 \cdot 22,5^2 \cdot 0,318} = 1,05 \quad \checkmark$$

$$A_{\text{eff}} = 1 \cdot 0,318 = 0,318 \text{ m}^2$$

$$C_{Fy} = \frac{F_y}{\frac{1}{2} \rho U^2 A_{\text{eff}}} = \frac{-55,567}{\frac{1}{2} \cdot 1,2 \cdot 22,5^2 \cdot 0,318} = -0,575 \quad \checkmark$$

c) $U_0 = 20 \text{ m/s}$

$$\rho = 1 \text{ kg/dm}^3 = 1000 \text{ kg/m}^3$$

$$\frac{L_s}{L_k} = 5$$

$$F_x = C_{Fx} \cdot \frac{1}{2} \rho U_0^2 \cdot 5 A_{\text{eff}} = 1,05 \cdot \frac{1}{2} \cdot 1000 \cdot 20^2 \cdot 5 \cdot 0,318 = 335\,900 \text{ N} = 335,9 \text{ kN} \quad \checkmark$$

$$F_y = C_{Fy} \cdot \frac{1}{2} \rho U_0^2 \cdot 5 A_{\text{eff}} = -0,575 \cdot \frac{1}{2} \cdot 1000 \cdot 20^2 \cdot 5 \cdot 0,318 = -182\,850 \text{ N} = -182,85 \text{ kN} \quad \checkmark$$