

# Seminariepass 7

1. ( $\curvearrowright$ )  $\Sigma M_y = 0$

$$100g \cdot 1,2 - A_z \cdot 2,4 = 0$$

$$A_z = 50g = \underline{490,5N}$$

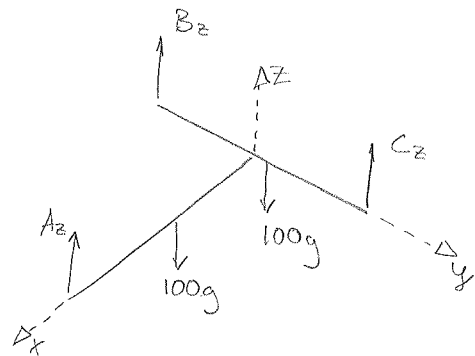
( $\uparrow$ )  $\Sigma F_z = 0$

$$A_z + B_z + C_z - 200g = 0$$

( $\curvearrowleft$ )  $\Sigma M_x = 0$

$$-100g \cdot 0,3 + C_z \cdot 1,5 - B_z \cdot 0,9 = 0$$

$$\Rightarrow B_z = \underline{797,1N}, C_z = \underline{674,4N}$$



2. ( $\uparrow$ )  $A_z - 30g = 0 \Rightarrow A_z = \underline{294,3N}$

( $\curvearrowright$ )  $-B_y \cdot 1,5 - 30g \cdot 0,9 = 0$

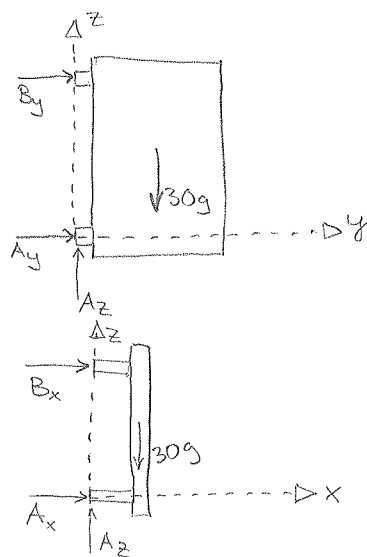
$$B_y = \underline{-176,6N}$$

( $\rightarrow$ )  $-176,6 + A_y = 0$

$$A_y = \underline{176,6N}$$

( $\curvearrowright$ )  $30g \cdot 0,36 + B_x \cdot 1,5 = 0 \Rightarrow B_x = \underline{-70,6N}$

( $\rightarrow$ )  $-70,6N + A_x = 0 \Rightarrow A_x = \underline{70,6N}$



3.  $\vec{F}_{AB} = F \vec{e}_{AB} = F \frac{\vec{AB}}{|\vec{AB}|} = F \frac{\vec{r}_{CB} - \vec{r}_{CA}}{|\vec{r}_{CB} - \vec{r}_{CA}|} =$

$$= F \frac{(-0,36, 0,24, 0,72)}{\sqrt{0,36^2 + 0,24^2 + 0,72^2}} = F(-0,43, 0,29, 0,86)$$

$$\vec{D} = (D_x, 0, D_z) \quad \vec{G} = (0, 0, -100g)$$

$$\Sigma \vec{M}_C = \vec{r}_{CA} \times \vec{F}_{AB} + \vec{r}_{CD} \times \vec{D} + \vec{r}_{CG} \times \vec{G} = \vec{0}$$

$$\Sigma \vec{M}_C = \begin{vmatrix} \vec{e}_x & \vec{e}_y & \vec{e}_z \\ 0,9 & 0 & 0 \end{vmatrix} F + \begin{vmatrix} \vec{e}_x & \vec{e}_y & \vec{e}_z \\ 0 & 1,2 & 0 \end{vmatrix} \begin{matrix} D_x \\ 0 \\ D_z \end{matrix} + \begin{vmatrix} \vec{e}_x & \vec{e}_y & \vec{e}_z \\ 0,27 & 0,6 & 0,36 \end{vmatrix} \begin{matrix} 0 \\ 0 \\ -100g \end{matrix} =$$

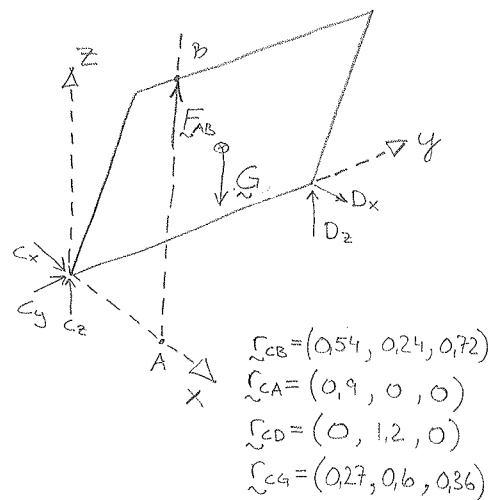
$$= -\vec{e}_y \cdot 0,9 \cdot 0,86 F + \vec{e}_z \cdot 0,9 \cdot 0,29 F + \vec{e}_x \cdot 1,2 D_z - \vec{e}_z \cdot 1,2 D_x - \vec{e}_x \cdot 0,6 \cdot 100g + \vec{e}_y \cdot 0,27 \cdot 100g = \vec{0}$$

$$\vec{e}_y: F = \frac{0,27 \cdot 100g}{0,9 \cdot 0,86} = \underline{343N}$$

$$\vec{e}_z: D_x = \frac{0,9 \cdot 0,29}{1,2} F = \underline{74,1N}$$

$$\vec{e}_x: D_z = \frac{0,6 \cdot 100g}{1,2} = \underline{490,5N}$$

$$D_N = \sqrt{D_x^2 + D_z^2} = \underline{496N}$$



$$\vec{r}_{CB} = (0,54, 0,24, 0,72)$$

$$\vec{r}_{CA} = (0,9, 0, 0)$$

$$\vec{r}_{CD} = (0, 1,2, 0)$$

$$\vec{r}_{CG} = (0,27, 0,6, 0,36)$$