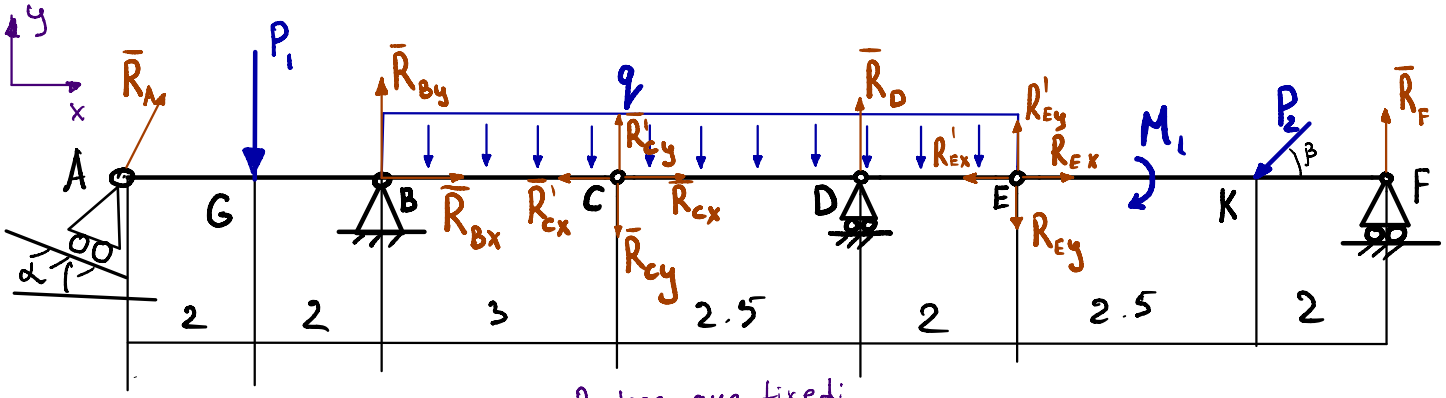


RO: 3 rigid bodies : AC, CE, EF.

Method: statics

Bodies are fixed:

AC: A-roller support R_A
B- support R_{Bx}, R_{By}
C-pin R'_{Cx}, R'_{Cy}

CE: C-pin R_{Cx}, R_{Cy}
D- roller support R_D
E-pin R'_{Ex}, R'_{Ey}

EF: E-pin R_{Ex}, R_{Ey}
F-roller support R_F

Force analysis:

AC: $R_A \rightarrow R_A\cos\alpha$, $R_A\sin\alpha$

$R'_{Cy} = -R_{Cy}$; $R'_{Cx} = -R_{Cx}$

$R'_{Ey} = -R_{Ey}$; $R'_{Ex} = -R_{Ex}$

Solution:

$$AC:\begin{cases} x: R_A\cos\alpha + R_{Bx} - R'_{Cx} = 0 \\ y: R_A\sin\alpha + R_{By} + R'_{Cy} - q\cdot BC - P_1 = 0 \\ M_A: -P_1\cdot AG + R_{By}\cdot AB - q\cdot BC\cdot\left(AB + \frac{BC}{2}\right) + R'_{Cy}\cdot AC = 0 \end{cases}$$

$$CE:\begin{cases} x: R_{Cx} - R'_{Ex} = 0 \\ y: -R_{Cy} + R'_{Ey} + R_D - q\cdot CE = 0 \\ M_E: -R_D\cdot DE + q\cdot CE\cdot\frac{CE}{2} + R_{Cy}\cdot CE = 0 \end{cases}$$

$$EF:\begin{cases} x: R_{Ex} - P_2\cdot\cos\beta = 0 \\ y: -R_{Ey} - P_2\sin\beta + R_F = 0 \\ M_E: -P_2\cdot(\sin\beta)\cdot EK - M_1 + R_F\cdot EF = 0 \end{cases}$$

$$-R_D\cdot DE + q\cdot\frac{CE^2}{2} + R_D\cdot CE - 7.372\cdot CE = 0$$

$$R_D = \frac{7.372\cdot CE - q\cdot\frac{CE^2}{2}}{CE - DE} = 7.5996$$

Answer:

$R_A = 4.68$

$R_{Bx} = 5.69$

$R_{By} = 14.38$

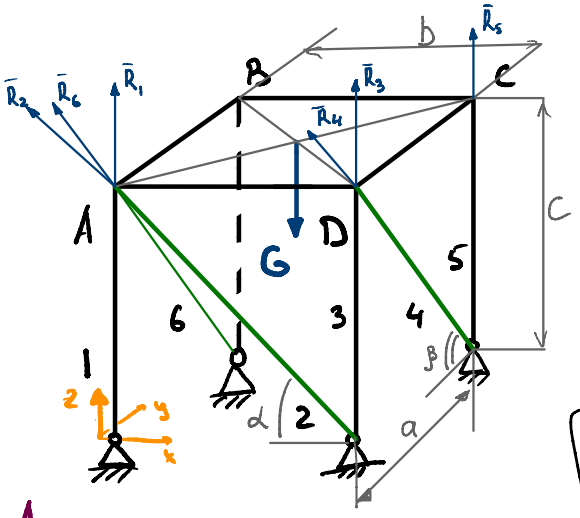
$R_{Cx} = 9$

$R_{Cy} = -1.487$

$R_D = 3.74$

$R_{Ex} = 9.0$ $R_{Ey} = 1.072$

$R_F = 16.66$



RO: 1 rigid body ABCD, 1-6 rods.

Method: statics

Body is fixed: A - rod 1 R_1, rod 2 R_2, rod 6 R_6; B - rod 3 R_3, rod 4 R_4; C - rod 5 R_5

Force analysis:

$R_2 \rightarrow$ x: $R_2 \cdot \cos\alpha$; z: $R_2 \cdot \sin\alpha$

$R_6 \rightarrow$ y: $-R_6 \cdot \cos\beta$; z: $R_6 \cdot \sin\beta$

$R_4 \rightarrow$ y: $-R_4 \cdot \cos\beta$; z: $R_4 \cdot \sin\beta$

Solution:

$$
\begin{cases}
x: & -R_2 \cdot \cos\alpha + P = 0 \\
y: & -R_6 \cdot \cos\beta - R_4 \cdot \cos\beta = 0 \\
z: & R_6 \cdot \sin\beta + R_4 \cdot \sin\beta + R_2 \cdot \sin\alpha + R_1 + R_3 + R_5 - G = 0 \\
M_{Ax}: & R_5 \cdot a - G \cdot \frac{a}{2} = 0 \\
M_{Ay}: & -(R_5 \cdot b + R_3 \cdot b + R_4 \cdot b \sin\beta) + G \cdot \frac{b}{2} = 0 \\
M_{Az}: & -R_4 \cdot \cos\beta \, b - P \cdot a = 0
\end{cases}
$$

Answer:

$R_1 = -37.(6)$

$R_2 = 38.005848$

$R_3 = 23.(3)$

$R_4 = -35.43382$

$R_5 = 9.0$

$R_6 = 35.4338$