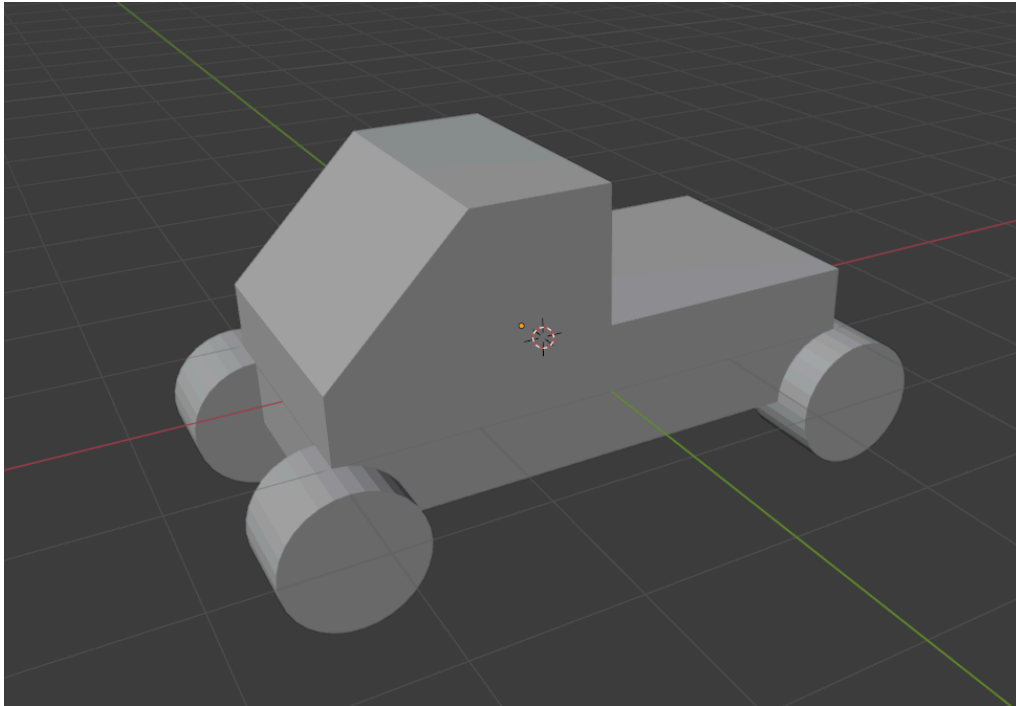
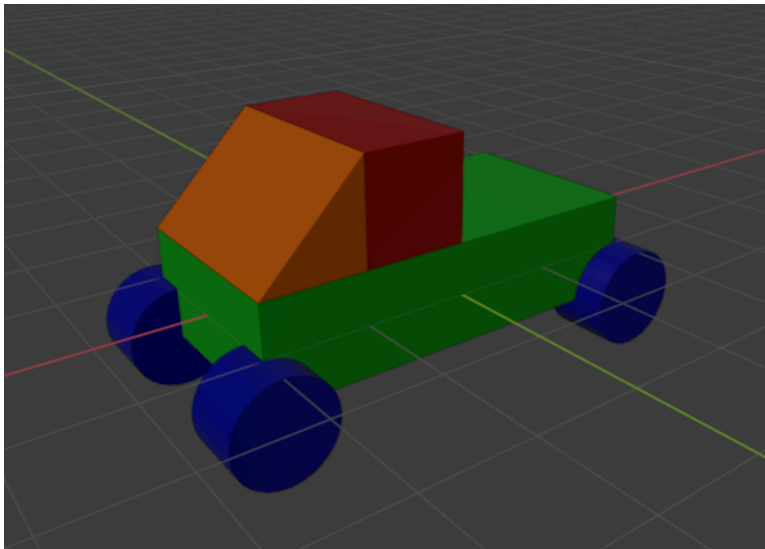


Partiel Math Partie Écrite :



2. Volumes :



$$V_{\text{vert}} = 2 \times 0.5 \times 1 = 1$$

$$V_{\text{Rouge}} = 0.5 \times 0.5 \times 1 = \frac{1}{4}$$

$$V_{\text{Orange}} = V_{\text{Rouge}} / 2 = \frac{1}{8}$$

$$V_{\text{Bleu}} = \left(\frac{1}{4}\right)^2 \times \pi \times \frac{1}{3} = \pi/48$$

$$\text{MasseTotale} = 1 + \frac{1}{4} + \frac{1}{8} + 4 \times (\pi/48) = 1.64$$

3. Centres d'inertie :

Cvert (0,0,0), Crouge($\frac{1}{4}, 0, \frac{1}{2}$), Corange($-\frac{2}{3}, 0, \frac{5}{12}$),

Cbleu1($-1, -\frac{1}{2}, -\frac{1}{4}$), Cbleu2($-1, \frac{1}{2}, -\frac{1}{4}$), Cbleu3($1, -\frac{1}{2}, -\frac{1}{4}$), Cbleu4($1, \frac{1}{2}, -\frac{1}{4}$)

4. Matrices d'inerties :

$$M_{\text{vert}} = \begin{pmatrix} \frac{17}{48} & 0 & 0 \\ 0 & \frac{5}{48} & 0 \\ 0 & 0 & \frac{5}{12} \end{pmatrix}$$

$$M_{\text{rouge}} = \begin{pmatrix} \frac{1}{96} & 0 & 0 \\ 0 & \frac{5}{192} & 0 \\ 0 & 0 & \frac{5}{192} \end{pmatrix}$$

$$M_{\text{bleu}} = \frac{\pi}{48} \begin{pmatrix} \frac{1}{64} + \frac{1}{108} & 0 & 0 \\ 0 & \frac{1}{64} + \frac{1}{108} & 0 \\ 0 & 0 & \frac{1}{32} \end{pmatrix}$$

$$M_{\text{orange}} = \begin{pmatrix} \frac{1}{48} & 0 & 0 \\ 0 & \frac{5}{48} & 0 \\ 0 & 0 & \frac{5}{48} \end{pmatrix}$$