US419

Side View Sketch

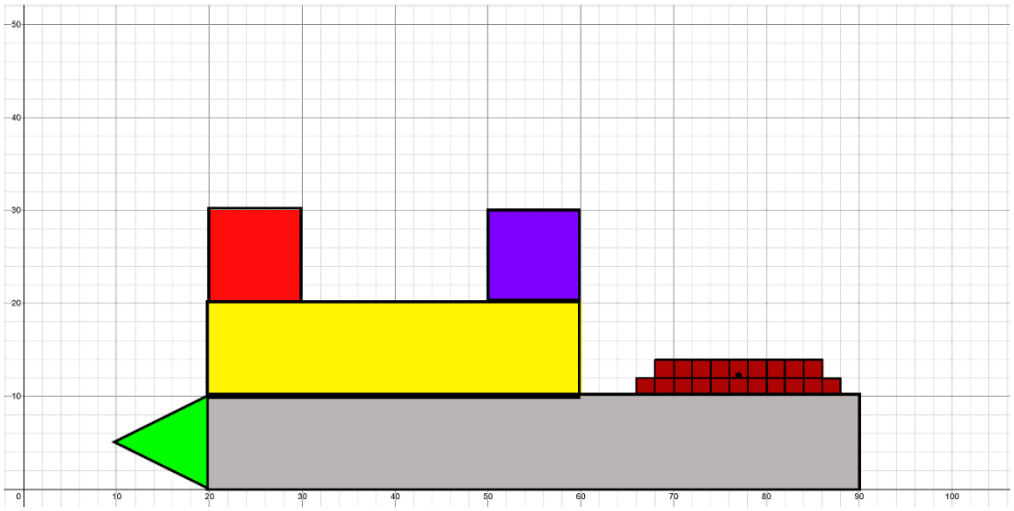

Figure 1 - Vessel type 71 sketch (side view)

Upper View Sketch

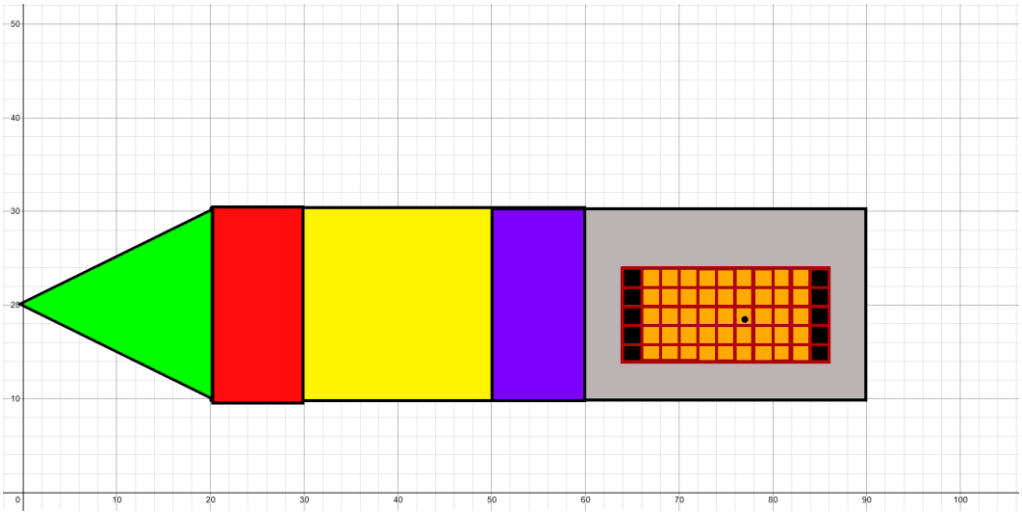

Figure 2 - Vessel type 71 sketch (upper view)

Cálculo do centro de massa

Para o cálculo do centro de massa, iremos aplicar a seguinte fórmula:

$$center\ of\ mass = \frac{sum\ of\ all\ (position \times mass)}{sum\ of\ all\ masses}$$

$$X = \frac{\sum_i^n m_i x_i}{\sum_i^n m_i} = \frac{m_1 x_1 + m_2 x_2 + \cdots + m_n x_n}{m_1 + m_2 + \cdots + m_n}$$

Figure 3 - Formula for the center of mass calculation

Assumindo que a massa (m) é igual para todos os contentores, tem-se:

$$X = \frac{m \times \sum_i^n x_i}{m \times i}$$

Simplificando a expressão, obtemos:

$$X = \frac{\sum_i^n x_i}{i}$$

Assim, calculando o centro de massa para as 3 coordenadas, temos:

Coordenada x

$$X = \frac{67 + 2 \times 69 + 2 \times 71 + 2 \times 73 + 2 \times 75 + 2 \times 77 + 2 \times 79 + 2 \times 81 + 2 \times 83 + 2 \times 85 + 87}{20}$$

$$\Leftrightarrow X = \mathbf{77}$$

Coordenada Z

$$Z = \frac{11 \times 11 + 9 \times 13}{20} = \mathbf{11,9}$$

Coordenada Y

$$Y = \frac{15 \times 20 + 17 \times 20 + 19 \times 20 + 21 \times 20 + 23 \times 20}{100} = \mathbf{19}$$

Podemos, então, concluir que o centro de massa é **C(77; 11,9; 19)**.