The object shown below is made from a piece of thin, homogenous wire. Determine the location \((\bar{x}, \bar{y})\) of the center of gravity using the x-y coordinate system shown on the figure.

\[ \Sigma L = 771 \text{ mm} \]
\[ \Sigma \bar{x}L = 0 \text{ mm}^2 \]
\[ \bar{x} = \frac{\Sigma \bar{x}L}{\Sigma L} = 0 \text{ mm} \]
\[ \Sigma \bar{y}L = -45000 \text{ mm}^2 \]
\[ \bar{y} = \frac{\Sigma \bar{y}L}{\Sigma L} = -58.4 \text{ mm} \]

Determine the location \((\bar{x}, \bar{y})\) of the centroid for the shaded area shown below using the x-y coordinate system shown on the figure.

\[ \Sigma A = 22 \text{ in}^2 \]
\[ \Sigma \bar{x}A = 66 \text{ in}^3 \]
\[ \Sigma \bar{y}A = 97 \text{ in}^3 \]
\[ \bar{x} = \frac{\Sigma \bar{x}A}{\Sigma A} = 3 \text{ in} \]
\[ \bar{y} = \frac{\Sigma \bar{y}A}{\Sigma A} = 4.41 \text{ in} \]
Determine the location \((\bar{x}, \bar{y})\) of the centroid for the shaded area shown below using the x-y coordinate system shown on the figure.

\[
\begin{align*}
\text{Area} & = 1.28 \text{ m}^2 \\
\overline{x} & = \frac{959 \text{ m}^3}{128 \text{ m}^2} = 7.49 \text{ m} \\
\overline{y} & = \frac{650 \text{ m}^3}{128 \text{ m}^2} = 5.07 \text{ m}
\end{align*}
\]

The object shown below is made of homogenous metal. Determine the location \((\bar{x}, \bar{y}, \bar{z})\) of the center of gravity using the x-y coordinate system shown on the figure.

\[
\begin{align*}
\overline{x} & = \frac{4.12 \times 10^8}{1.093 \times 10^7} = 38.2 \text{ mm} \\
\overline{y} & = \frac{1.563 \times 10^8}{1.093 \times 10^7} = 14.3 \text{ mm} \\
\overline{z} & = 0
\end{align*}
\]