

Section 7.7. Centers of Mass of Objects

Note. If the *mass density* ρ of an object (in mass/volume units) relates differentials of mass and volume as $dm = \rho dV$, the center of mass is

$$\bar{x} = \frac{\int_V \rho x dV}{\int_V \rho dV}, \quad \bar{y} = \frac{\int_V \rho y dV}{\int_V \rho dV}, \quad \text{and} \quad \bar{z} = \frac{\int_V \rho z dV}{\int_V \rho dV}$$

for an object occupying volume V .

Note. If ρ is constant, the volume is homogeneous and the center of mass and centroid are the same.

Example. Page 372 Number 7.105.

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