



Engaging Physics Tutoring

Lektion 13

Photoeffekt
Massenschwerpunkt

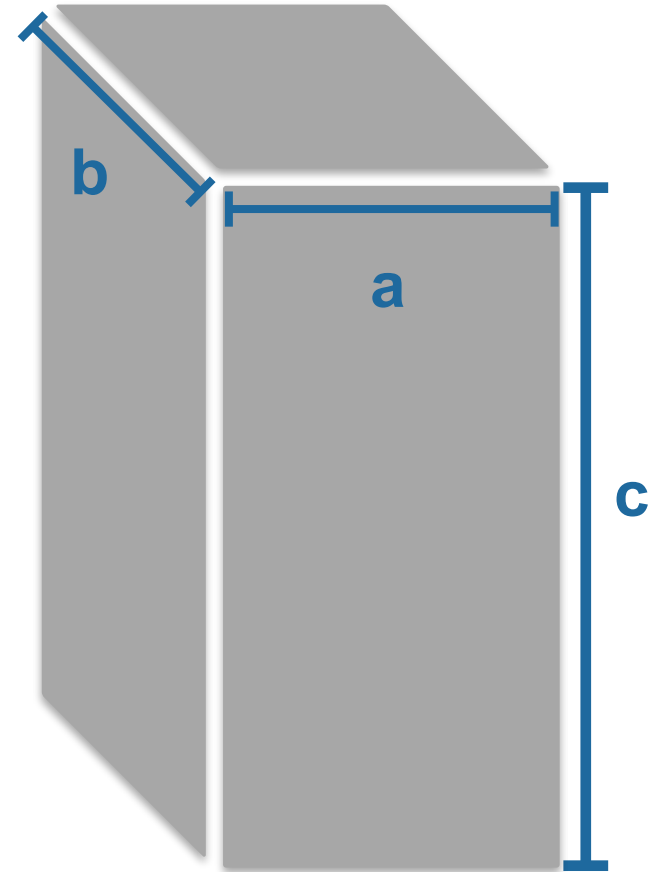
Aufgaben

Massenschwerpunkt

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Wo liegt der Massenschwerpunkt des Quaders?

Der Zylinder habe eine gleichmässig verteilte Dichte von ρ .

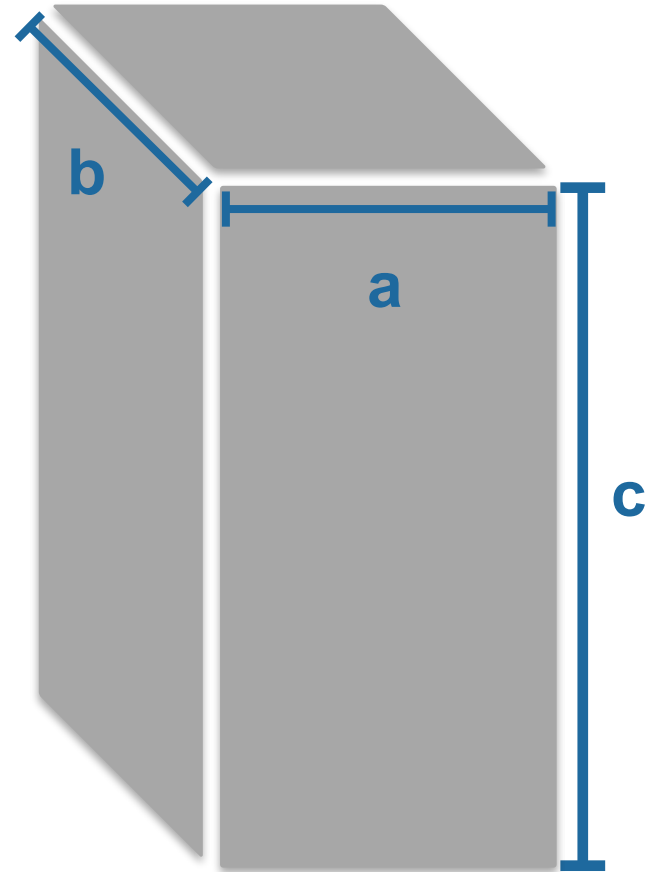


Massenschwerpunkt

Benutze Formel für Schwerpunkt:

$$\vec{r}_s = \frac{\int \vec{r} dm}{\int dm} = \frac{\int \vec{r} \rho dV}{\int \rho dV}$$

Ersetze: $dV = dx dy dz$ $\vec{r} = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$



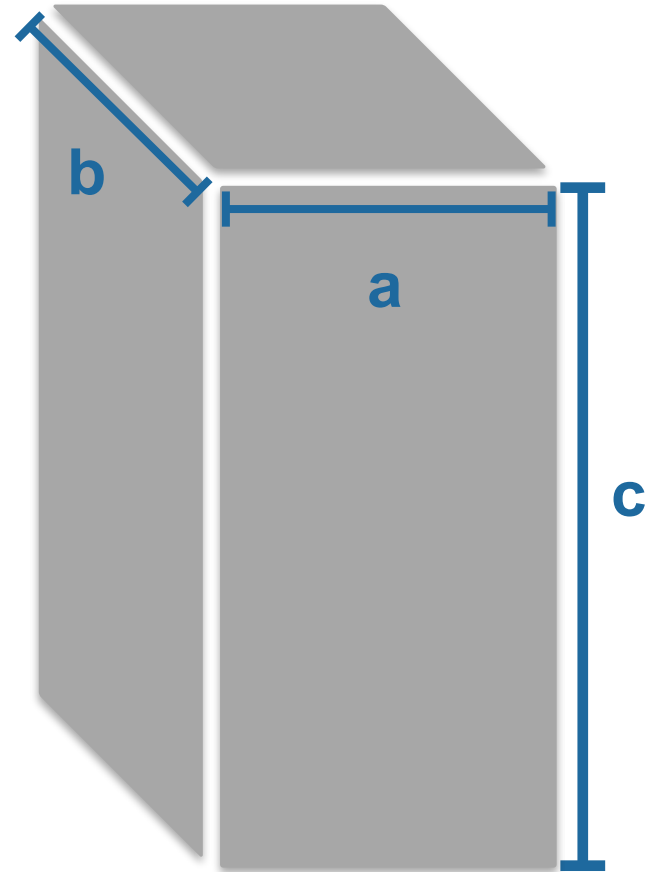
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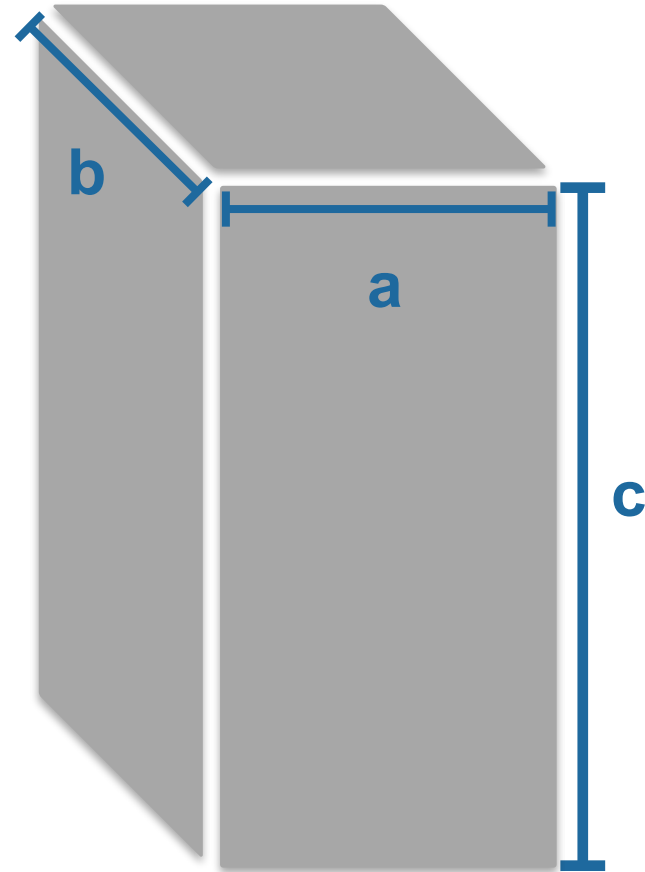
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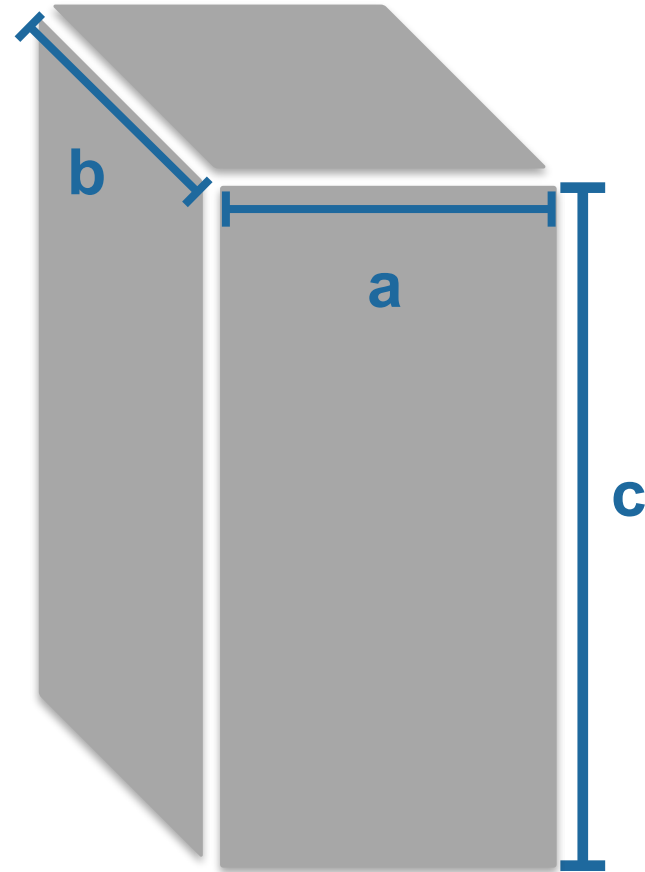
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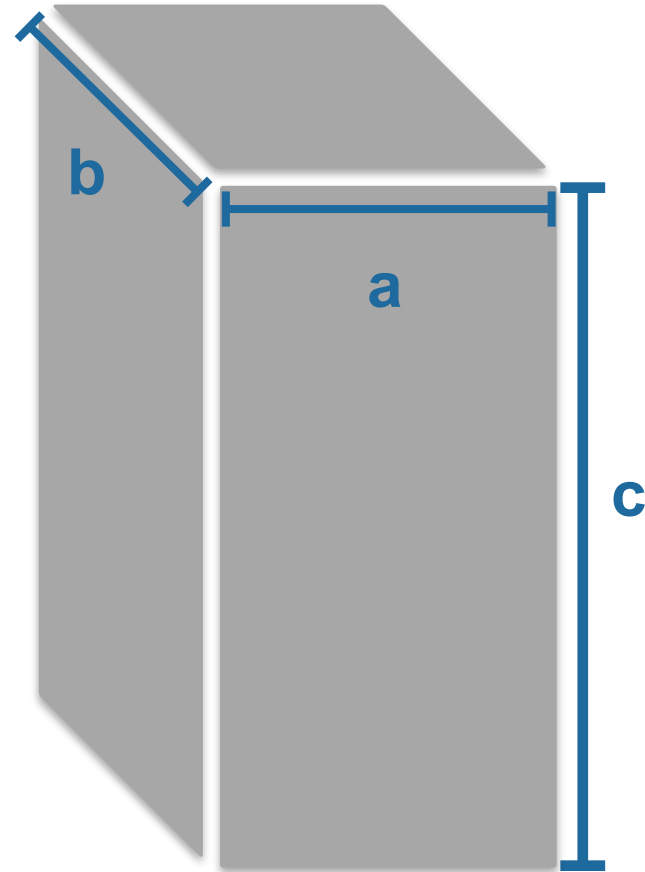
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$$\int \vec{r} \rho dV = \rho \int_0^a \int_0^b \int_0^c \begin{pmatrix} x \\ y \\ z \end{pmatrix} dx dy dz = \rho \begin{pmatrix} \int_0^a \int_0^b \int_0^c x dx dy dz \\ 0 \\ 0 \\ \int_0^a \int_0^b \int_0^c y dx dy dz \\ 0 \\ 0 \\ \int_0^a \int_0^b \int_0^c z dx dy dz \\ 0 \\ 0 \\ 0 \end{pmatrix} = \rho \begin{pmatrix} \frac{a^2}{2} bc \\ \frac{b^2}{2} ac \\ \frac{c^2}{2} ab \end{pmatrix}$$

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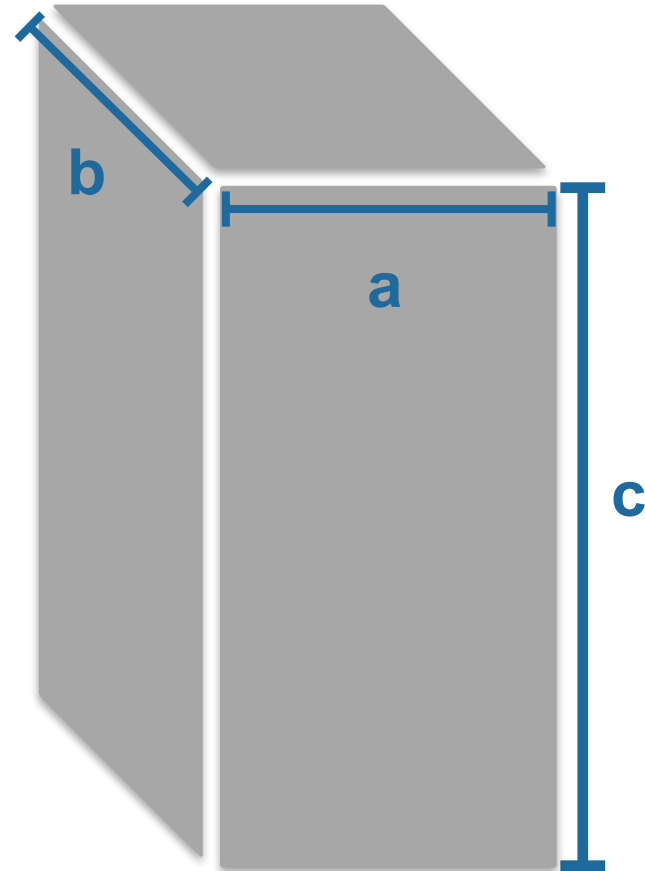


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