$$(a)\,\{a\}\,[a]\,\langle a\rangle\,|a|\,\|a\| \tag{1}$$

$$\left(\frac{a}{b}\right)\left\{\frac{a}{b}\right\}\left[\frac{a}{b}\right]\left\langle\frac{a}{b}\right\rangle\left|\frac{a}{b}\right|\left\|\frac{a}{b}\right\| \tag{2}$$

$$\left(\frac{a^2}{b}\right)\left\{\frac{a^2}{b}\right\}\left[\frac{a^2}{b}\right]\left\langle\frac{a^2}{b}\right\rangle\left|\frac{a^2}{b}\right|\left\|\frac{a^2}{b}\right\| \tag{3}$$

$$\left(\frac{a^2}{b^2}\right)\left\{\frac{a^2}{b^2}\right\}\left[\frac{a^2}{b^2}\right]\left\langle\frac{a^2}{b^2}\right\rangle\left|\frac{a^2}{b^2}\right|\left\|\frac{a^2}{b^2}\right\| \tag{4}$$

$$\left(\int\frac{a^2}{b^2}\right)\left\{\int\frac{a^2}{b^2}\right\}\left[\int\frac{a^2}{b^2}\right]\left\langle\int\frac{a^2}{b^2}\right\rangle\left|\int\frac{a^2}{b^2}\right|\left\|\int\frac{a^2}{b^2}\right\| \tag{5}$$

$$\left(\sqrt{\frac{a^2}{b^2}}\right)\left\{\sqrt{\frac{a^2}{b^2}}\right\}\left[\sqrt{\frac{a^2}{b^2}}\right]\left\langle\sqrt{\frac{a^2}{b^2}}\right\rangle\left|\sqrt{\frac{a^2}{b^2}}\right|\left\|\sqrt{\frac{a^2}{b^2}}\right\| \tag{6}$$

$$(\ 1\ )\{\ 1\ \}[\ 1\ ]\langle\ 1\ \rangle|\ 1\ |\|\ 1\ \| \tag{7}$$

$$(\ 1^2\ )\{\ 1^2\ \}[\ 1^2\ ]\langle\ 1^2\ \rangle|\ 1^2\ |\|\ 1^2\ \| \tag{8}$$

$$\begin{pmatrix}1&2\\3&4\end{pmatrix}\left\{\begin{matrix}1&2\\3&4\end{matrix}\right\}\left[\begin{matrix}1&2\\3&4\end{matrix}\right]\left\langle\begin{matrix}1&2\\3&4\end{matrix}\right\rangle\left|\begin{matrix}1&2\\3&4\end{matrix}\right|\left\|\begin{matrix}1&2\\3&4\end{matrix}\right\| \tag{9}$$

$$\begin{pmatrix}1&2\\3&4\\5&6\end{pmatrix}\left\{\begin{matrix}1&2\\3&4\\5&6\end{matrix}\right\}\left[\begin{matrix}1&2\\3&4\\5&6\end{matrix}\right]\left\langle\begin{matrix}1&2\\3&4\\5&6\end{matrix}\right\rangle\left|\begin{matrix}1&2\\3&4\\5&6\end{matrix}\right|\left\|\begin{matrix}1&2\\3&4\\5&6\end{matrix}\right\| \tag{10}$$

$$\begin{pmatrix}1&2\\3&4\\5&6\\7&8\end{pmatrix}\left\{\begin{matrix}1&2\\3&4\\5&6\\7&8\end{matrix}\right\}\left[\begin{matrix}1&2\\3&4\\5&6\\7&8\end{matrix}\right]\left\langle\begin{matrix}1&2\\3&4\\5&6\\7&8\end{matrix}\right\rangle\left|\begin{matrix}1&2\\3&4\\5&6\\7&8\end{matrix}\right|\left\|\begin{matrix}1&2\\3&4\\5&6\\7&8\end{matrix}\right\| \tag{11}$$

Definition 1. The Galilean group is defined as

$$\mathrm{Gal}(3) \quad = \quad \left\{\begin{bmatrix}1&0&s\\ \mathbf{v}&R&\mathbf{y}\\0&0&1\end{bmatrix}\,\middle|\, s\in\mathbb{R}\,,\,\mathbf{y},\mathbf{v}\in\mathbb{R}^3\,,\,R\in\mathrm{O}(3)\right\}$$

with a natural closed Lie subgroup structure of $\mathrm{GL}(5;\mathbb{R})$