Exercise 29

In Exercises 29 to 31, use vector methods to describe the given configurations.

The parallelepiped with edges the vectors **a**, **b**, and **c** emanating from the origin

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Solution

Assuming that the vectors, **a**, **b**, and **c**, are linearly independent, the entire three-dimensional space is spanned by taking a linear combination of these three.

$$\mathbf{r}(s,t,u) = s\mathbf{a} + t\mathbf{b} + u\mathbf{c}$$

By restricting s, t, and u to be between 0 and 1, only points within the parallelepiped with edge vectors, **a**, **b**, and **c**, are obtained.

$$\{s\mathbf{a} + t\mathbf{b} + u\mathbf{c},\ 0 \le s \le 1,\ 0 \le t \le 1,\ 0 \le u \le 1\}$$