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> restart;
> with(LinearAlgebra) : with(plottools) : with(plots) :
> #i
v_1 := Vector([2, 3, 0])

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$$v_1 := \begin{bmatrix} 2 \\ 3 \\ 0 \end{bmatrix} \quad (1)$$

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> v_2 := Vector([1, -2, 3])

```

$$v_2 := \begin{bmatrix} 1 \\ -2 \\ 3 \end{bmatrix} \quad (2)$$

```

> u_1 := \frac{v_1}{\text{Norm}(v_1, 2)}

```

$$u_1 := \begin{bmatrix} \frac{2\sqrt{13}}{13} \\ \frac{3\sqrt{13}}{13} \\ 0 \end{bmatrix} \quad (3)$$

```

> u_2 := \frac{(v_2 - (u_1 \cdot v_2) \cdot u_1)}{\text{Norm}(v_2 - (u_1 \cdot v_2) \cdot u_1, 2)}

```

$$u_2 := \begin{bmatrix} \frac{21\sqrt{2158}}{2158} \\ -\frac{7\sqrt{2158}}{1079} \\ \frac{3\sqrt{2158}}{166} \end{bmatrix} \quad (4)$$

```

> # ii
> null_vector := Vector([0, 0, 0])

```

$$\text{null_vector} := \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix} \quad (5)$$

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> line_v1 := line(null_vector, v_1, color = purple)
line_v1 := CURVES\left(\begin{bmatrix} 0. & 0. & 0. \\ 2. & 3. & 0. \end{bmatrix}, \text{COLOUR}(\text{RGB}, 0.50196078, 0., \right. \quad (6)

```

0.50196078)

> line_v2 := line(null_vector, v_2, color = orange)

line_v2 := CURVES $\left(\begin{bmatrix} 0. & 0. & 0. \\ 1. & -2. & 3. \end{bmatrix}, \text{COLOUR}(\text{RGB}, 0.80000000, 0.19607843, \right.$ (7)

0.19607843)

> line_u1 := line(null_vector, u_1, color = blue)

line_u1 := CURVES $\left(\begin{bmatrix} 0. & 0. & 0. \\ 0.554700196225229 & 0.832050294337844 & 0. \end{bmatrix}, \right.$ (8)

COLOUR(RGB, 0., 0., 1.00000000))

> line_u2 := line(null_vector, u_2, color = red)

line_u2 := CURVES([[0., 0., 0.], (9)

[0.452057391355098, -0.301371594236732, 0.839535155373754]],
COLOUR(RGB, 1.00000000, 0., 0.))

> display(line_v1, line_v2, line_u1, line_u2)

