

Finding a Generalized Eigenvector with Maple

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> with(LinearAlgebra):
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```
> A:=Matrix([[ -5, -1],[4, -1]]);
```

$$A:=\begin{bmatrix} -5 & -1 \\ 4 & -1 \end{bmatrix} \quad (1)$$

```
> Eigenvectors(A);
```

$$\begin{bmatrix} -3 \\ -3 \end{bmatrix}, \begin{bmatrix} -\frac{1}{2} & 0 \\ 1 & 0 \end{bmatrix} \quad (2)$$

```
> V:=Matrix([[1],[-2]]); # I used this for an eigenvector.
```

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

```
> LinearSolve(A+3*IdentityMatrix(2),V);
```

$$\begin{bmatrix} -\frac{1}{2} - \frac{1}{2} - t_{1,1} \\ -t_{1,1} \end{bmatrix} \quad (4)$$

Any value for $t_{1,1}$ will give a generalized eigenvector. When doing this example in class I used $t_{1,1} = -1$, which gives $[0, -1]^T$.