

How to get Eigenvalues in Maple

This quick help file will show you how to get eigenvalues in maple. The tutor function in maple is helpful in going over the basic ideas. I will use in this example the linalg package. (If you type "with(linalg);" it will give you a list of commands in the package that you can use. If you want to know how to use the command then click on the command then go to your menu at the top of maple and click help and help with "name of command you click on". I generated a random two by two matrix and assigned it to "A". I then assigned "I2" as the identity matrix of the same size. I multiplied λ by the identity matrix I2 minus the primary matrix A and assigned it the value C. Then I got the determinant of C to get the characteristic polynomial and assigned it to the value CP. From there I solved the polynomial equation and got two eigenvalues.

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restart :
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with(linalg) :
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$$A := \begin{bmatrix} 44 & -31 \\ 92 & 67 \end{bmatrix} :$$

$$I2 := \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} :$$

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C :=  $\lambda$ ·I2 - A;
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$$\begin{bmatrix} \lambda - 44 & 31 \\ -92 & \lambda - 67 \end{bmatrix} \quad (1.1)$$

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CP := det(C);
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$$\lambda^2 - 111\lambda + 5800 \quad (1.2)$$

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solve(CP,  $\lambda$ );
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$$\frac{111}{2} + \frac{1}{2} I\sqrt{10879}, \frac{111}{2} - \frac{1}{2} I\sqrt{10879} \quad (1.3)$$

```
Check := eigenvalues(A);
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$$\frac{111}{2} + \frac{1}{2} I\sqrt{10879}, \frac{111}{2} - \frac{1}{2} I\sqrt{10879} \quad (1.4)$$

As you can see when we checked the work with the "eigenvalues" command we received the same answer.

I hope you find this helpful if you are using Maple in your class. Should you have any suggestions for improvement or if you need tutoring please feel free to contact me at joseph_pousada@optonline.net.