

Vectors with the TI-89

Note that the text uses $\langle 5,5 \rangle$ for the component form of a vector, where the machine uses $[5,5]$.

To find the magnitude and angle of a vector, given the components

Got to MODE. Put the Vector Format in CYLINDRICAL, choice 2, hit ENTER.
Use the brackets (shift of “,” and “÷”) to enclose the vector’s components.

Example: Write “[3,3]”, hit ENTER. You will see $[3\sqrt{2} \text{ p } 45]$ if in degree mode, or $[3\sqrt{2} \text{ p } \frac{\pi}{4}]$ if in radian mode. So the magnitude is $3\sqrt{2}$ and the angle is 45° or $\frac{\pi}{4}$.

To find the components of a vector, given the magnitude and direction

Got to MODE. Put the Vector Format in RECTANGULAR, choice 1, hit ENTER.
Enter the magnitude and angle as follows.

Example: If the vector has magnitude 5 and direction 135° , write “[5, p 135E]”, hit ENTER.
Note the comma after the 5.

You will see $\left[\frac{5\sqrt{2}}{2} \quad \frac{5\sqrt{2}}{2} \right]$, whether degree or radian mode, as long as you entered the degree sign on 135.

If several vectors are given in magnitude angle format, they can be added together and changed to component form all in one move.

Example: Add together the vectors with the following magnitudes and direction angles:

40, 20° ; 15, 88° ; 10, 220° . Be in CYLINDRICAL mode. Write $[40, \text{ p } 20^\circ] + [15, \text{ p } 88^\circ] + [10, \text{ p } 220^\circ]$, hit the green diamond, then ENTER. You should see $[37.709874 \text{ p } 36.147536]$ (assuming you are in degree mode), which gives the magnitude and direction angle of the sum.