

Determining cross products and dot products using the TI-89:

In the examples below, the calculator should be using rectangular coordinates for vectors (use MODE - Vector Format - Rectangular).

There are two ways to accomplish these functions:

1. using the numerical values of the vectors to find the cross and dot products
2. saving the vectors as variables and using the variable names to find the cross and dot products

1. Using numerical values:

<u>Cross product:</u> Find the crossP function under CATALOG crossP([1, 2, 3], [5, 0, -1]) Enter (-2.000, 16.000, -10.000) (the result)	<u>Dot product:</u> Find the dotP function under CATALOG dotP([1, 2, 3], [5, 0, -1]) Enter 2.0000 (the result)
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2. Using variables:

<u>Store vectors P and Q as follows:</u> [1, 2, 3] STO alpha p (or use any other name desired) [5, 0, -1] STO alpha q

Now vector operations may be performed using P and Q, including cross and dot products as shown below:

<u>Cross product:</u> Find the crossP function under CATALOG crossP(p, q) Enter (-2.000, 16.000, -10.000) (the result)	<u>Dot product:</u> Find the dotP function under CATALOG dot(P, Q) Enter 2.0000 (the result)
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Note: The TI-89 can also determine:

- A. the length of a vector: Use the function **norm** under CATALOG.
- B. a unit vectors in the direction of a given vector: Use the function **unitV** under CATALOG