

Vector Conversions on the TI-81 Calculator

The following instructions explain the key-by-key keystrokes necessary to convert a vector in Rectangular form to a vector in Polar form, and vice versa.

Before you begin, adjust the angular **MODE** of your calculator. If you want input or output in degrees, set the calculator to **DEGREE**; if you want radians, set the calculator to **RADIAN**.

Rectangular to Polar Conversion

1. Press **MATH**
2. Select **R►P**(: press **ENTER** to put it on the main screen.
3. Enter the rectangular components (x,y) of the vector: **1,3** for our example here.
4. Press **)**

On the main screen you will see

R►P(1,3)

5. Press **ENTER** to get the radial component of your vector: **3.16227766**
6. R and θ are stored in the variables **R** and **θ** . To display both components press:

ALPHA R ENTER ALPHA θ ENTER

7. On the main screen you will see:

R
3.16227766
 θ
71.56505118 *(if you are in **DEGREE** mode)*

or

R
3.16227766
 θ
1.24904577 *(if you are in **RADIAN** mode)*

8. The vector can now be written in polar form.

$$(\mathbf{R}, \theta) = 3.16227766 \angle 71.56505118^\circ$$

Vector Conversions on the TI-81 Calculator

The following instructions explain the key-by-key keystrokes necessary to convert a vector in Polar form to a vector in Rectangular form.

Before you begin, adjust the angular **MODE** of your calculator. If you want input or output in degrees, set the calculator to **DEGREE**; if you want radians, set the calculator to **RADIAN**.

Polar to Rectangular Conversion

When you enter the angle be sure it agrees with the current angular mode of the calculator. Enter degrees if it is in **DEGREE** mode and radians if it is in **RADIAN** mode. When in doubt, you may check and, if necessary, change the mode even in the middle of this entry process.

*(Be sure you are in **DEGREE** mode for this example.)*

1. Press **MATH**
2. Use the down arrow to select **P►R**(: press **ENTER** to put it on the main screen.
3. Enter the polar components (R,θ) of the vector: **3.16227766, 71.56505118** for our example here.
4. Press **)**

On the main screen you will see

P►R(3.16227766,71.56505118)

5. Press **ENTER** to get the x component of your vector: **1.000000**
6. x and y are stored in the variables **X** and **Y**. To display both components press:

ALPHA X ENTER ALPHA Y ENTER

7. On the main screen you will see:

X	1.000000
Y	3.000000

8. The vector can now be written in rectangular form.

$$(1, 3) = 1i + 3j$$