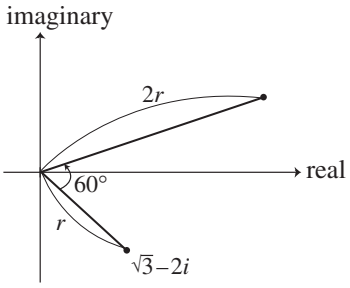
Problems Involving Complex Numbers, with an Emphasis on Polar Form

(fx-100MS/fx-115MS/fx-570MS/fx-991MS only)

Example 1 **Rotate $\sqrt{3} - 2i$ 60 degrees around the origin of the complex plane, and then determine the point with a ratio of 2 with the origin as the center.**

Explanation Defining r as the distance of point (a, b) from the origin on the complex plane and θ as the angle formed with the positive part of the x-axis makes it possible to express complex number $z = a + bi$ as $z = r(\cos\theta + i\sin\theta)$. This is called polar representation of complex number z. Using polar representation for z_2 in the complex number multiplication $z_1 \times z_2$ gives us $z_2 = r_2(\cos\theta_2 + i\sin\theta_2)$. Now we can rotate z_1 $\theta_2°$ around the origin of the complex plane, giving us a value with a ratio of r_2 with the origin as the center.



Operation

1. Select the CMPLX Mode.

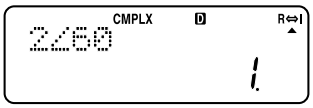
MODE 2

2. Specify the angle unit .

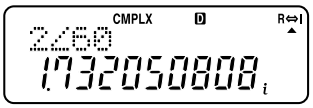
MODE MODE MODE MODE 1 (Deg)

3. Input the polar form of the complex number, with $r = 2$, and $\theta = 60$. The values you input are automatically converted to rectangular form on the display, but you can also display them in polar form.

2 SHIFT ∠ 60 =

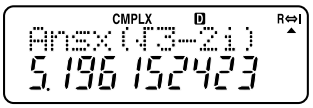


SHIFT Re↔Im



4. Multiply by $\sqrt{3} - 2i$.

[×] [(] [√] [3] [−] 2 [*i*] [)] [=]



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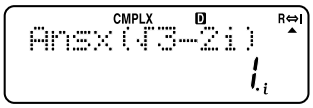

The above obtains the complex number 5.196152423 + i.