Answer on Question #42777 – Math - Calculus

Using the given zero, find one other zero of f(x). Explain the process you used to find your solution.

2 - 3i is a zero of f(x) = x4 - 4x3 + 14x2 - 4x + 13.

Solution:

We will use Horner's method (http://en.wikipedia.org/wiki/Horner%27s_method).

So we will create a table of coefficients of equation $x^4 - 4x^3 + 14x^2 - 4x + 13 = 0$:

	1	**-4**	**14**	**-4**	**13**

We will try (2 + 3i) as a zero of the equation:

	1	-4	14	-4	13
2 + 3i					

We copy a first coeficient and put it below:

	1	-4	14	-4	13
2 + 3i	**1**				

Then we multiply my new zero (2+3i) and "1" and put answer in the table:

	1	-4	14	-4	13
		2+3i			
2 + 3i	1				

Then we add "-4" and (2+3i) and put answer in the table:

	1	-4	14	-4	13
		2+3i			
2 + 3i	1	**-2+3i**			

Then we multiply $(2+3i)(-2+3i) = -4 - 6i + 6i + 9i^2 = -4 - 9 = -13$ and put it in the table.

	1	-4	14	-4	13
		2+3i	**-13**		
2 + 3i	1	-2+3i			

Analogically till the end of the table:

	1	-4	14	-4	13
		2+3i	-13	2+3i	-13
2 + 3i	1	-2+3i	1	-2+3i	0

We have received zero in the end. It means, that (2+3i) is a zero of the equation.

Answer:

2+3i