
Subject: Better Root Finder

Posted by [Max Watson](#) on Sun, 15 Apr 2007 04:55:41 GMT

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IDL's `fx_root` seems very limited; when I want to find the root of say $x^3 - 8$ with the initial guess vector `[-1,-100,100]`, IDL returns a complex number: `( -1.00000, 1.73205)`. Is there a way that `fx_root` can be easily modified so that it can find the right answer with a bad initial guess?

Subject: Re: Better Root Finder

Posted by [James Kuyper](#) on Mon, 16 Apr 2007 15:15:24 GMT

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Max Watson wrote:

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> $x^3 - 8$ with the initial guess vector `[-1,-100,100]`, IDL returns a
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> `fx_root` can be easily modified so that it can find the right answer
> with a bad initial guess?

As has already been pointed out, that is "a" right answer, just not the one that you wanted. When there are multiple roots, it's logically impossible for a root finding technique to guarantee that it will give you the one you want, unless you give it sufficient information to determine which of those roots IS the one you want. An initial guess that is sufficiently close to the desired solution is one approach; methods that are restricted to finding real roots would be another approach, if the root you want is the only real one.
