

# Poles an Zeros

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*Source:* <http://sci.tech-archive.net/Archive/sci.electronics.basics/2008-02/msg00823.html>

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  - *Date:* Thu, 28 Feb 2008 19:14:25 -0800 (PST)
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Hello,

Could someone explain to me Poles and Zeros.  
What does a Pole do and what does a zero do and how they interact together.  
How does phase, gain, and delays relate to them?

If a book or a link could be recommended along with a what math needs to be used. (maybe a course outline to work from)

I am right now working on systems which I have an good idea on how they work but I don't seem to have the underlying understanding or how to calculate.

Some fully worked out examples I can look at would also be helpful. I just seem to be missing parts. I have found information. But I am having some issues putting it all together. A number of fields all converge and I am not able to find a path and seem to be jumping around and not getting anywhere.

The area I am interested in are digitally controlled power converters (DC/AC and DC/DC power supplies).

Thank you,  
Rob

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