

References Chapter 2, 3 and Appendix A in *DSP First Text*

Videos: Professor Van Veen is an award winning instructor at the University of Wisconsin - Madison. This channel contains short topical lectures on a wide range of signal processing topics.

1. Sinusoids are easily defined using trigonometry, an approach that naturally exposes the relationship between phasors and sinusoids. You will also learn the definition of the amplitude, phase, and frequency of a sinusoid. <http://AllSignalProcessing.com> for more great signal processing content, including problems with solutions, concept/screenshot files, quizzes, MATLAB and data files. 11:16

<https://www.youtube.com/watch?v=8z0D1gDRw8M&feature=youtu.be>

2. Why Study Sinusoids?

Sinusoids occur as a natural physical phenomenon and play an important role in signal processing and communications. Virtually any signal can be expressed as a weighted sum of sinusoids, and the response of a very useful class of systems is completely characterized by how the system responds to sinusoids. <http://AllSignalProcessing.com> for more great signal processing content, including problems with solutions, concept/screenshot files, quizzes, MATLAB and data files. 5:24

<https://www.youtube.com/watch?v=yXjXJ5OINyQ&feature=youtu.be>

2a. Example Finding Parameters of a Sinusoid from a Graph 6:19

This video illustrates finding the amplitude, phase, and frequency of a sinusoid from the graph of the sinusoid.

<https://www.youtube.com/watch?v=h72Eax1jQkw&feature=youtu.be>

3. Complex Numbers Review (Wouldn't hurt to review)

Review of how to work with complex numbers in rectangular and polar coordinates. 10:22

<https://www.youtube.com/watch?v=UAn9uah7puU&list=PLGI7M8vwfrFNO-gQ1xoJmN3bJy2-wp2J3>

4. Complex Sinusoid Representations for Real Sinusoids 13:21

A complex-valued sinusoid is defined in terms of amplitude, frequency, and phase. Graphically it is shown as a vector in the complex plane that rotates at a constant rate given by the frequency. The length of the vector defines the amplitude while the angle with respect to the real axis at time zero defines the phase. Such a rotating vector is termed a phasor. Real-valued sinusoidal signals are defined as a sum of two rotating vectors, one associated with positive frequency or counter-clockwise rotation and the other associated with negative frequency or clockwise rotation. This graphical depiction explains for sinusoids the meaning of "negative frequency".

<https://www.youtube.com/watch?v=Tm3gl6PQOYo&feature=youtu.be>

5. Barry VanVeen Introduction to DSP

Introductory overview of the field of signal processing: signals, signal processing and applications, philosophy of signal processing, and language of signal processing. 12:58

<https://youtu.be/YmSvQe2FDKs>

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