

Homework #3, ENGN 100-300, F15. Due **Thu. Oct. 15, in class**

Notes

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- This is an individual assignment, not a group project. Refer to the course syllabus for the collaboration policies.
 - For unstapled solutions, only the first page will be graded.
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1. [5] A periodic signal with period $1/2000$ sec is known to be band-limited with maximum frequency 12000 Hz. How many samples must be taken of this signal to be able to determine its Fourier series coefficients?

2. [5] A sinusoidal signal has amplitude 7, frequency 440 Hz, and phase $\pi/3$. How fast must we sample this signal to avoid aliasing?

3. [5] Sketch the spectrum of the signal $x(t) = 5 + 3 \cos(2\pi 200t) + 4 \cos(2\pi 300t)$.

4. [5] Sketch the spectrum of the signal $x(t) = 6 \cos(2\pi 200t) \cos(2\pi 300t)$. Be careful!

5. [5] How fast must we sample the signal $x(t) = 6 \cos(2\pi 200t) \cos(2\pi 300t)$ to avoid aliasing?

6. [5] Determine the fundamental period of the signal that has the following spectrum.

