

Amath390 Mathematics & Music
Quiz 1
Thursday, Oct. 6 4:30-6:00pm
STC 0050

The midterm will cover the material in the online lecture notes, up to page 35 and assignments 1-3. Assignment 3 is due Wednesday at noon and the solutions will be posted that day.

You should be able to

- solve the oscillator equation, unforced and also with periodic forcing
- write the solution to the oscillator equation as a sum of sines and cosines and also as a sine wave with phase shift
- understand resonance and how to calculate the resonant frequency for an undamped oscillator
- understand assumptions in the modelling of
 - vibrating strings (such as piano and guitar strings),
 - various wind instruments as long thin tubes
- understand the relevance of various parameters in the model to the characteristics of a string or wind instrument
- calculate the fundamental frequency of various instruments using the models in the lecture notes
- solve the wave equation with various boundary conditions
- know the meaning of the words frequency, phase shift, Hertz, resonance, pitch, timbre, fundamental frequency, harmonic, overtone

Only an approved pink tie calculator is permitted; no other aids will be allowed.

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