AMath390

Math & Music **Fall 2016**

Assignment # 6 Due: noon Nov. 17 in dropbox 6 slot 3 (s.1) or slot 4 (s. 2)

Note: Give all answers to 3 significant digits.

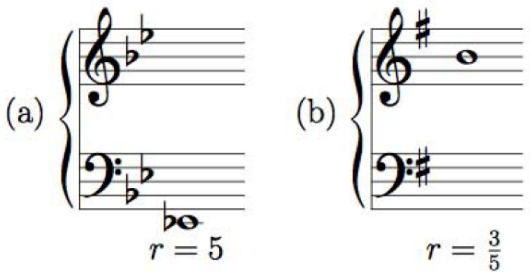
1. Label the note with pitch 440 Hz as A. Find the frequency of the sixth note in the scale, (usuallly called $F^{\#}$) in Pythagorean, just intonation, and equal temperament.

2. In equal temperament, what factor do you multiply the root note (tonic) by to obtain the 7^{th} note in the (major) scale?

3. (a) How much does a equally tempered fifth differ from a just fifth in cents?

   (b) Repeat (a) for thirds.

4. Write on a staff the note that best approximates the frequency having the given interval ratio r from the given note. Use the standard equal temperament scale. Explain your calculations.



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5. Consider an equally tempered system with 19 notes.

   (a) What note best approximates the ratio $\frac{3}{2}$? Give the error in cents.

   (b) In the usual equally tempered system with 12 notes, which note best approximates the ratio $\frac{3}{2}$? Which system, 12-tet or 19-tet, yields a smaller error?