MAT 120 — Homework 4 — Fall 2023

Due date: Tuesday, Oct.11

Notes: We showed how to tune a keyboard with fifths and octaves, assuming the fifth is given as f cents. Refer to the Equal Tempered version of this tuning as ET, and the MeanTone version as MT and the Just version as JT. We showed that MT and JT both have wolf fifths, one being flat to ET and the other being sharp to ET. Assume the tuning process starts with C as we did in class so that the wolf fifth is from F to C.

1. Write the sequence of 12 semitones in the chromatic scale from C to C by using the symbols s_1 and s_2.

2. How many different types of whole tones occur in each of the tuning systems MT and JT? Write each type of whole tone in terms of a sequence of semitones and also give the cent value.

3. Same question for minor third. (Call these m_1, m_2, etc.)

4. Same question for major third. (Call these M_1, M_2, etc.)

5. Same question for major triad. Write these as a type of major third followed by a type of minor third. Show which type of triad occurs in each of the twelve keys.