

Homework 2

Math 109 / Music 109A, Spring 2020

Due Monday, February 10.

1. In $\frac{3}{2}$ time, give the duration in beats for:

- (a) a dotted sixteenth note
- (b) a quarter note with four dots

In $\frac{12}{8}$ time, taken as a compound time signature, give the duration in beats for:

- (c) a dotted half note
- (d) an eighth note tied to a thirty-second note

2. Prove the equation:

$$1 + r + r^2 + \cdots + r^m = \frac{1 - r^{m+1}}{1 - r}.$$

for any integer $m \geq 0$ and any real number $r \neq 1$. Hint: Consider the product $(1 - r)(1 + r + r^2 + \cdots + r^m)$. Explain how this relates to the durations of dotted notes.

3. Notate and name the following triplets:

- (a) that which divides the half note into 7 equal notes
- (b) that which divides the eighth note into 5 equal notes
- (c) that which divides the whole note into 11 equal notes

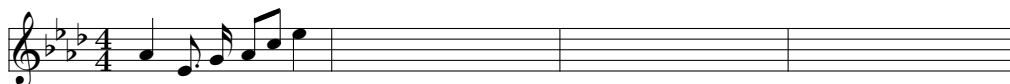
Notate and give the total duration, in $\frac{4}{4}$ time, of:

- (a) a sixteenth note septuplet
- (b) a quarter note triplet

4. Complete these measures with a single durational note:

(a) $\frac{3}{4}$  (b) $\frac{4}{4}$  (c) $\frac{9}{8}$ 

5. Complete the following example three ways with a measure having the same rhythm,



employing, respectively:

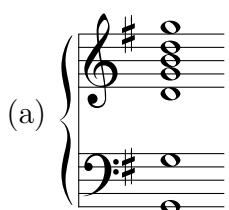
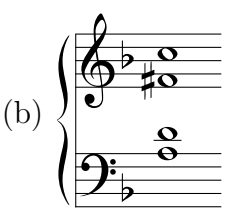
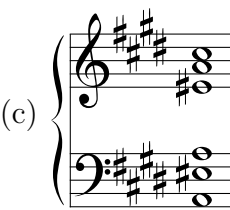
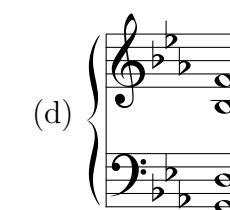
- (a) diatonic transposition up one scale tone
- (b) diatonic transposition up three scale tones
- (c) chromatic transposition down a minor third

Which of these, if any, represent both diatonic and chromatic transposition?


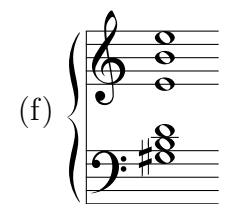
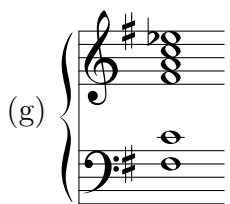
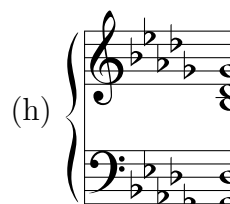
6. For the chorus of the song *Carolina In the Morning*, give the form (e.g., ABAC or ABA) by dividing the chorus into segments consisting of eight measures. The song is on the course web page under Handouts.

For the same refrain, locate transformations such as translation (melodic and/or rhythmic) and transposition (diatonic and/or chromatic), other than those that are dictated by the global form determined above. You may reference your discussion by numbering the measures, letting measure 1 be the first measure of the chorus.

7. Identify these chords by root note and suffix (e.g., Gm⁷ or B^b aug). In the case of augmented or diminished seventh chords, take the root to be the lowest note.

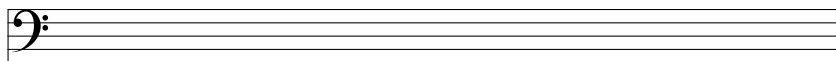
(a)  (b)  (c)  (d) 

Identify these chords by root scale note and suffix (e.g., III⁷ or #IV m) relative to the indicated mode. Again, in the case of augmented or diminished seventh chords, take the root to be the lowest note.

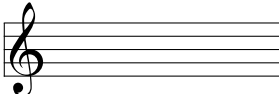
(e)  major
 (f)  minor
 (g)  major
 (h)  Lydian

8. Write these chords with correct spelling on the bass clef.

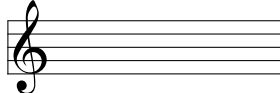
- (a) E^bm⁷ (b) D dim (c) G^b (d) C[#]7



9. Write these chords with correct spelling on the given clef, using the indicated key signature and mode.

(a) \flat III⁷ in the key of C major 

(b) IVm⁷ in the key of B^b minor 

(c) I aug in the key of A Myxolydian 

(d) \flat VII in the key of A^b Dorian 

10. Name the chord given by each of these sequence of semitones:

- (a) 4,5 (b) 2,4,3 (c) 6,3,6 (d) 7,8,7 (e) 8,16,27

Name the chord given by each of these sequence of intervals:

- (a) fifth, fourth, major third, tritone
(b) major third, minor sixth, major sixth
(c) fifth, octave, minor third, tritone
(d) step, fifth, major sixth
(e) minor third, minor third, step