

# 301 Set Theory Practice Exam Answer Key

A) Pitch Inversions. Assume C4=0

For the following, do one of the following: given two chords, find the pitch inversion that relates them; or, given a chord and a pitch inversion, find the inversion of the chord.

1) **Ip25**      2) **Ip24**      3) **Ip27**

B) Pitch-Class Inversions. Assume C=0

For the following, do one of the following: given two chords, find the pitch-class inversion that relates them; or, given a chord and a pitch-class inversion, find the inversion of the chord (of course, any registral distribution of the correct pitch classes will be considered correct).

4) 1) **I11**      2) **I3**      3) **I3**

**D F# Ab Bb**

C) Set Class and Interval Vector.

For each of the following pitch class sets, find the set class name (best normal order) and calculate the interval vector. Which sets are Z related?

7) **[0158]**      **[014679]**      **[0247]**      **[01247]**

**<101220>**      **<224232>**      **<021120>**      **<222121> Z rel.**

11) **[0148]**      **[01356]**      **[02358]**

**<101310>**      **<222121> Z rel.**      **<123121>**

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## D) Invariant Subsets.

For the following pitch-class set, find three pitch-class transformations (inversions or transpositions) that result in invariant subsets of cardinality 3 or higher (trichords or larger). Name the transformation, write the resulting chord, and draw arrows pointing to the invariant pitch classes.

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The musical notation consists of a single staff in treble clef. The first measure contains the pitch-class set: G4, A4, B4, C5, D5, E5, F5, G5. The second measure shows the transformation  $I_{10}$  (inversion around C5), with arrows pointing to the invariant subset {G4, A4, B4}. The third measure shows the transformation  $I_1$  (inversion around G4), with arrows pointing to the invariant subset {G4, A4, B4}. The fourth measure shows the transformation  $T_3$  (transposition up by 3 semitones), with arrows pointing to the invariant subset {B4, C5, D5}.

**These are examples of correct answers, there may be others...**