

# Normal Form and Transformations

Name: \_\_\_\_\_

## PART 1: Normal form

Put the following groups of notes into normal form. The first is completed for you as an example.



a. [8, 11, 1, 3]



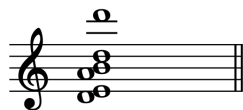
b. \_\_\_\_\_



c. \_\_\_\_\_



d. \_\_\_\_\_



e. \_\_\_\_\_



f. \_\_\_\_\_



g. \_\_\_\_\_

## PART 2: Calculating transformations

You are given several sets in normal order. Perform the requested operation, then write the new set in normal order. *Note that when you invert a set, you may have to recalculate its normal form.* The first is completed for you as an example.

Original	Transformation	New set in normal order
a. [5, 9, 11, 0]	$\overleftrightarrow{I_0}$	[0, 1, 3, 7] _____
b. [7, 9, 0, 1, 2]	$\overrightarrow{T_5}$	_____ _____
c. [0, 3, 4, 8]	$\overrightarrow{T_{11}}$	_____ _____
d. [2, 6, 9]	$\overrightarrow{T_9}$	_____ _____
e. [2, 5, 8, 9]	$\overleftrightarrow{I_9}$	_____ _____
f. [9, 10, 1, 3, 4, 6]	$\overleftrightarrow{I_2}$	_____ _____
g. [6, 9, 10, 11]	$\overleftrightarrow{I_6}$	_____ _____

## PART 3: Identifying transformations in normal form

The following pairs of sets may or may not be related by either transposition ( $T_n$ ) or inversion ( $I_n$ ). If the two are related by  $T_n$  or  $I_n$ , indicate the transformation type and index number; if they are not related, write “none.” The first is completed for you as an example.

	Set 1	Set 2	Relationship
a.	[5, 9, 11, 0]	[1, 2, 4, 8]	$I_1$ _____
b.	[7, 9, 0, 1, 2]	[2, 3, 4, 7, 9]	_____
c.	[0, 3, 4, 8]	[10, 1, 2, 6]	_____
d.	[2, 6, 9]	[5, 8, 0]	_____
e.	[2, 5, 8, 9]	[7, 10, 1, 2]	_____
f.	[9, 10, 1, 3, 4, 6]	[4, 5, 7, 10, 11, 0]	_____
g.	[6, 9, 10, 11]	[6, 7, 8, 11]	_____

## PART 4: Identifying transformations in a score

On the following page, you are given the final page of “Nacht” from *Pierrot Lunaire* by Arnold Schoenberg.

- In measure 20, all the trichords formed by the eighth-note triplets in the piano can be related by transposition or inversion.
  - Calculate the  $T_n$  and  $I_n$  relationships between adjacent trichords (horizontally) as well as trichords that occur simultaneously (vertically). *Hint: it may help to put sets in normal order first.*
  - Draw arrows connecting the trichords and label each arrow with the  $T_n$  or  $I_n$  relationship. One has been completed for you.
- In any instrument, find four other trichords that are related by  $T_n$  to the trichords in m. 20. As before, draw arrows connecting each pair and label it with the  $T_n$  relationship.

# Normal Order and Transformations

B-Kl. (B)  
Vcl.

un - - - sichtbar die Un - - - ge - tü - me auf die Men - - - schen -

*Iii*

B-Kl. (B)  
Vcl.

her - - - zen nie - der... fin - - stre,schwar - - ze

B-Kl. (B)  
Vcl.

Rie - - - sen - fal - ter.

nimmt Klarinette in A

sehr große Pause, aber quasi im Takt, dann folgt:  
**Gebet an Pierrot.**  
Klavier, Klarinette in A

A very long pause, but practically in tempo, then go on to  
"Gebet an Pierrot"