

Math, Mind, and Music

Quiz 3

April 15, 2005

Solve 3 out of four questions for a 100% score. Extra credit is possible.

1. (a) Define rhythm.
(b) What is cross rhythm?
(c) What is the relationship between duration and intensity of sound?
(1+2+2)

2. We discussed psychological experiments to quantify the perception of rhythm.
(a) What stimuli are used when investigating rhythm in simple psychological experiments?
(b) What is the dependent variable in these experiments?
(c) What tasks have the participants to perform? (Describe two.)
(2+1+2)

3. Music happens on vastly separate time scales. Indicate typical durations (or ranges of durations) for each of the following.
(a) Shortest repetition time such that two tones are perceived as separate
(b) Natural beat interval that humans choose without external stimuli
(c) Length of a single rhythmic pattern in music
(d) Length of a musical phrase
(e) Length of a single piece of music
(5)

4. Find and name as many symmetries as you can in the following excerpt of a piece by Webern.
(5)

Etwas lebhaft ♩ = ca 80

rit. tempo

rit.

Flute

Oboe

Clarinet

Trumpet

Piano

immer mit Dämpfer

f *p*

3 3

3 3

3 3

3 3

Detailed description: This is a page of a musical score for a woodwind and piano ensemble. The score is in 2/4 time and consists of five staves: Flute, Oboe, Clarinet, Trumpet, and Piano. The tempo is marked 'Etwas lebhaft' with a quarter note equal to approximately 80 beats per minute. The performance includes dynamic markings of *f* (forte) and *p* (piano), and articulation such as accents and slurs. The Clarinet and Piano parts feature triplet markings. The Trumpet part is marked 'immer mit Dämpfer' (always with mute). The score shows a rhythmic pattern of eighth and sixteenth notes, with some rests. The Flute and Oboe parts have a melodic line starting with a quarter rest followed by eighth notes. The Clarinet part has a melodic line starting with a quarter rest followed by eighth notes. The Trumpet part has a melodic line starting with a quarter rest followed by eighth notes. The Piano part has a complex rhythmic pattern in both hands, including triplets and slurs.