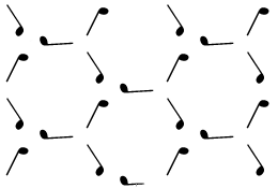
ILS 4430
NAME: _____

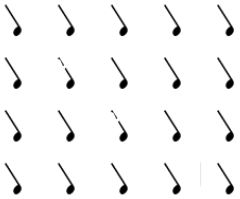
HOMEWORK
Spring 2018

1

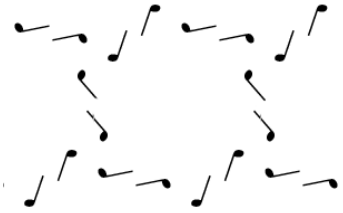
(T1) Problem 1: Classify each pattern as either 0° ,60°, 90°, 120°, or 180°, according to the smallest angle of rotation in the pattern. (10 points)

(a) 

Angle:

(b) 

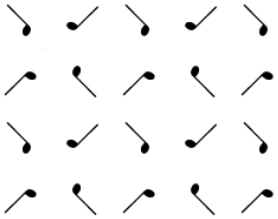
Angle:

(c) 

Angle:

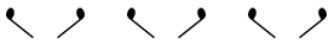
(d) 

Angle:

(e) 

Angle:

(T2) Problem 2: Classify the following frieze patterns in "Hop-Step-Jump" notation. (7 points)

(a) 

Hop-Step-Jump Notation:

(b) 

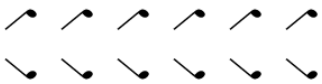
Hop-Step-Jump Notation:

(c) 

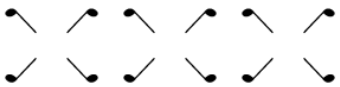
Hop-Step-Jump Notation:

(d) 

Hop Step-Jump Notation:

(e) 

Hop-Step-Jump Notation:

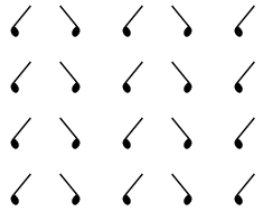
(f) 

Hop-Step-Jump Notation:

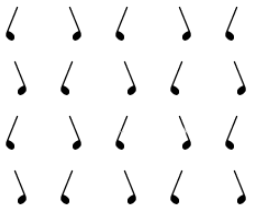
(g) 

Hop-Step-Jump Notation:

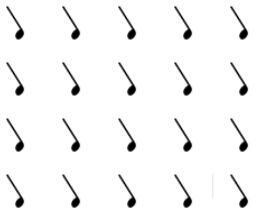
(T3) <u>Problem 3:</u> Classify each wallpaper pattern as either p111, p1m1, p1g1, or c1m1.
(8 points)

(a) 

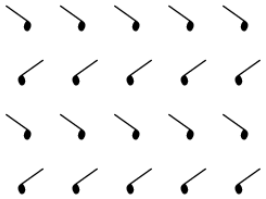
Pattern:

(b) 

Pattern:

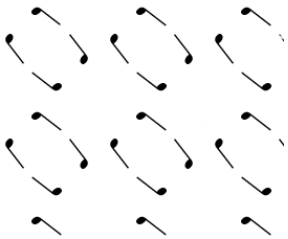
(c) 

Pattern:

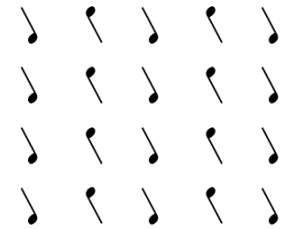
(d) 

Pattern:

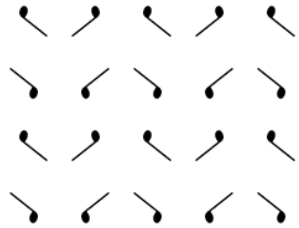
(T3) <u>Problem 4:</u> Classify each wallpaper pattern as either p211, p2mm, p2mg, p2gg, or c2mm.
(10 points)

(a) 

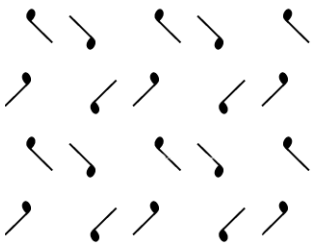
Pattern:

(b) 

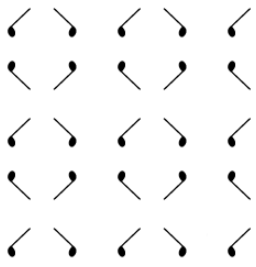
Pattern:

(c) 

Pattern:

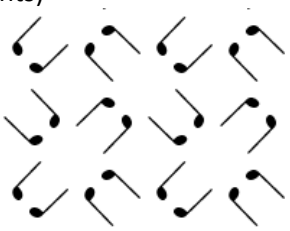
(d) 

Pattern:

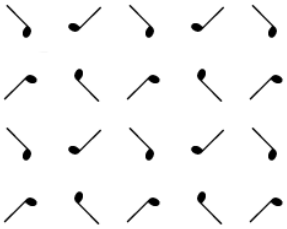
(e) 

Pattern:

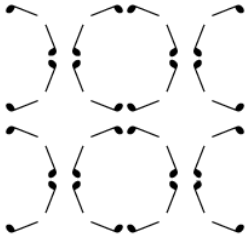
(T4) <u>Problem 5:</u> Classify each wallpaper pattern as either p411, p4gm, or p4mm.
(6 points)

(a) 

Pattern:

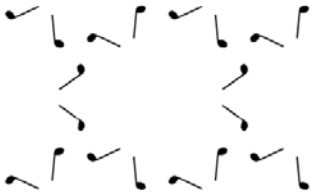
(b) 

Pattern:

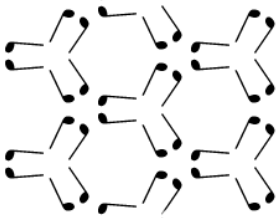
(c) 

Pattern:

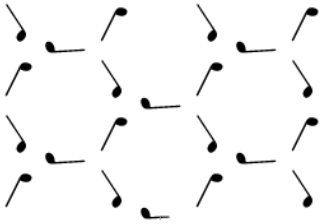
(T4) <u>Problem 6:</u> Classify each wallpaper pattern as either p311, p31m, or p3m1.
(6 points)

(a) 

Pattern:

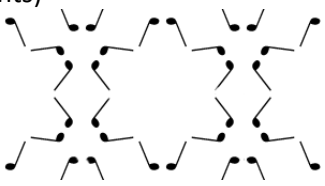
(b) 

Pattern:

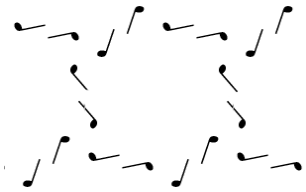
(c) 

Pattern:

(T4) <u>Problem 7:</u> Classify each wallpaper pattern as either p611 or p6mm.
(4 points)

(a) 

Pattern:

(b) 

Pattern:

(T5) Problem 8: Circle the vertex configuration(s) that violate the given rule.
(10 points)

Rule 1: In a semiregular tiling of the plane, the sum of the vertex angles of the polygons meeting at each vertex must be exactly 360°.

(a) 3.8.10.10 (b) 3.4.4.5 (c) 3.12.12 (d) 3.3.3.3.5

Rule 2: A semiregular tiling must have at least three and no more than five polygons meeting at each vertex.

(a) 3.8.10.10 (b) 4.5.6.7.7.10 (c) 3.12.12 (d) 3.4.4.5

Rule 3: No semiregular tiling can have four or more different polygons meeting at a vertex. Thus, if a semiregular tiling has four or more polygons meeting at a vertex, there must be some duplicates.

(a) 3.3.4.3.4 (b) 3.4.8.11.12 (c) 3.12.12 (d) 5.5.5.6

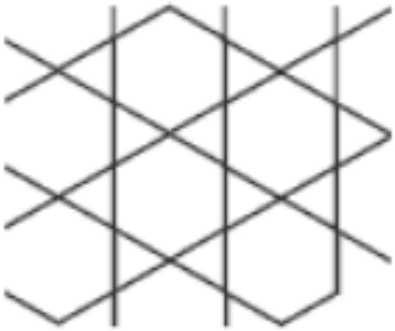
Rule 4: No semiregular tiling with exactly three polygons meeting at each vertex can have the vertex configuration k.n.m where k is odd unless n = m.

(a) 3.7.8 (b) 5.6.6 (c) 6.9.10 (d) 4.6.6

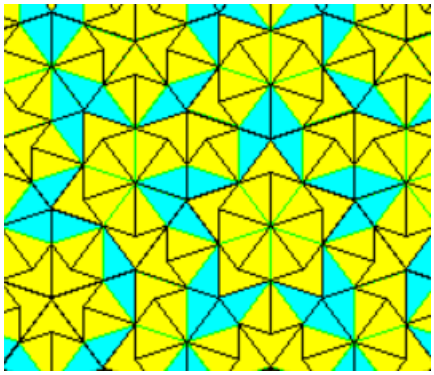
Rule 5: No semiregular tiling with exactly four polygons meeting at each vertex can have the vertex configuration 3.k.n.m unless k = m.

(a) 3.4.6.7 (b) 3.4.4.7 (c) 3.5.7.5 (d) 3.6.8.8

(T6) Problem 9: Construct the dual tiling of the semiregular tiling 3.6.3.6.
(10 points)



(T6 and T7) <u>Problem 10:</u> Classify the tiling type as Escher or Penrose.
(4 points)



Tiling Type:

Tiling Type: