Learning Works Charter School

Integrated Math IB
Module 9

Student Name: _____ Teacher Name: _____

As you work through the chapters in your Integrated Math 1 course, you will be encouraged to think and to make conjectures while you persevere through challenging problems and exercises. You will make errors – and that's okay! Learning and understanding occur when you make errors and push through mental roadblocks to comprehend and solve new and challenging problems.

<u>Text:</u> *Integrated Math I*, Big Ideas, 2016

**To ensure you are learning, you must show your work for all exercises.
YOU WILL <u>NOT EARN CREDIT</u> FOR ANSWERS <u>WITHOUT WORK</u>.**

Chapter 10: Parallel and Perpendicular Lines (10.1-10.5)

_____ Maintaining Mathematical Proficiency (page 495): Complete exercises #4, 5, 6

_____ 10.1 Pairs of Lines and Angles: Read the lesson and complete exercises
#1, 7, 8, 11, 12, 13, 14, 19, 30, 31

_____ 10.2 Parallel Lines and Transversals: Read the lesson and complete exercises
#3-8 s**all**, 13

_____ 10.3 Proofs with Parallel Lines: Read the lesson and complete exercises
#3, 4, 5, 6, 13, 14, 16, 19

_____ 10.4 Proofs with Perpendicular Lines: Read the lesson and complete exercises
#1, 3, 4, 11, 18, 23, 34-40 **all**

_____ 10.5 Using Parallel and Perpendicular Lines: Read the lesson and complete exercises
#1, 3, 22, 23

Students must complete the Chapter Review with a teacher or tutor at school.

_____ Chapter Review (pages 534-536): Complete exercises #1-16 **all**

Chapter 11: Transformations (11.1-11.4)

_____ Maintaining Mathematical Proficiency (page 541): Complete exercises #1-8 **all**

_____ 11.1 Translations: Read the lesson and complete exercises
#2, 5, 6, 11, 12, 13, 17, 25, 37

_____ 11.2 Reflections: Read the lesson and complete exercises
#2, 3, 4, 7, 13, 21, 22, 25

_____ 11.3 Rotations: Read the lesson and complete exercises
#1, 7, 9, 17, 18, 28

Students must complete the Chapter Review and Project with a teacher or tutor at school.

_____   Chapter Review (pages 578-580): Complete exercises #1-24 **all**
_____   Complete the attached Project **(No project = No credit)**

**A teacher or tutor reviewed the Chapter Review and Project with the student.**

Date: _____ Signature: _____

Grade

Integrated Math 1 Project
Module 9: Transformations
Textbook Pages 541-582

Mandala Project

Mandala is a Sanscrit word meaning "circle". In the Buddhist and Hindu religious traditions sacred art often takes the form of a mandala. Mandala shapes are symmetrical and geometrically based, and are found in religious art all over the world. **In this project, you will be using geometric rotations, translations (slides), reflections, and dilations to create a basic mandala shape.**
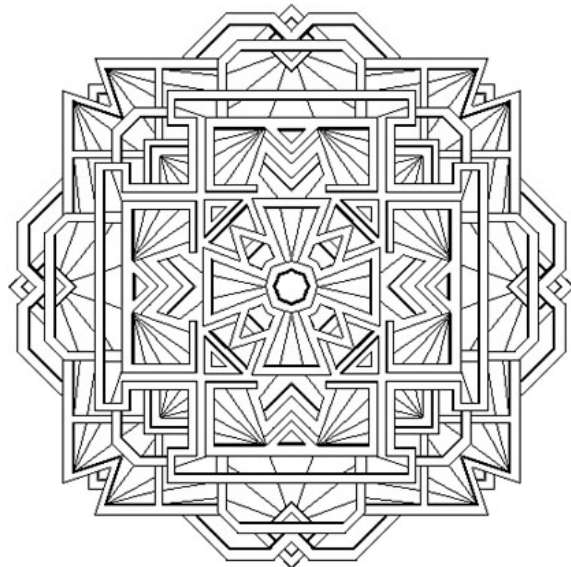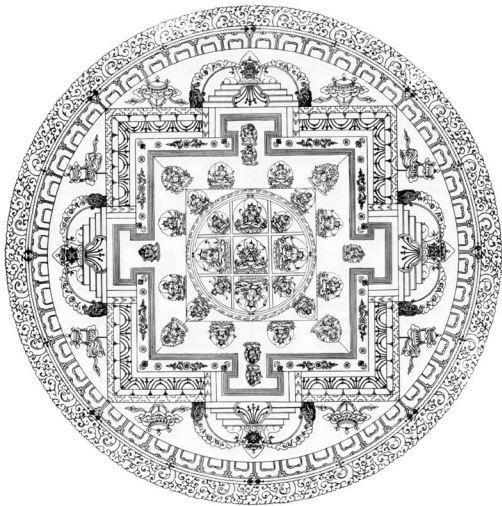
CREATE YOUR OWN MANDALA

Using a full sheet of graph paper, draw a coordinate plane in the middle. Lightly label the quadrants I, II, III, and IV (starting in upper right and going counterclockwise). Follow these directions carefully:

a) Draw a right isosceles triangle **in Quadrant I** with vertices (0,0) (0,12) (12,0)

b) Rotate the triangle 90° counterclockwise about the origin, (0,0).

List the new vertices:

(   )   (   )   (   )

c) Rotate the new triangle 90° counterclockwise about the origin.

List the new vertices:

(   )   (   )   (   )

d) Rotate the new triangle counterclockwise again about the origin.

List the new vertices:

(   )   (   )   (   ) You should be in Quadrant IV

e) Dilate the triangle **in Quadrant IV** by one half (divide all the coordinates by two).

List the new vertices:

(   )   (   )   (   ) You are still in Quadrant IV

f) Rotate this new triangle 90° counterclockwise about the origin three times.

List the vertices to each new triangle:

(   )   (   )   (   ) in Quadrant I

(   )   (   )   (   ) in Quadrant II

(   )   (   )   (   ) in Quadrant III

g) Translate (slide) the smaller triangle **in Quadrant III** one unit down and one unit left. List the

vertices of the new triangle:

(   )   (   )   (   ) in Quadrant III

h) Reflect the triangle from part g across the y-axis.

List the new vertices:

(   )   (   )   (   )

i)   Reflect the triangle from part h across the x-axis.

List the new vertices:

(   )   (   )   (   )

j) Reflect the triangle from part i across the y-axis.

List the new vertices:

(   )   (   )   (   ) You should be in Quadrant II

k) Translate (slide) the triangle **in Quadrant II** (from part j) three units up and three units left.

List the new vertices:

(   )   (   )   (   ) in Quadrant II

l) Dilate the triangle from part k by one half (divide all coordinates by two).

List the vertices:

(   )   (   )   (   ) You are still in Quadrant II

m) Reflect both triangles from parts k and l counterclockwise across the x-, then the y-, then the x-

axis.

You did it! Now personalize your mandalas with additional shapes if you wish. Be sure to maintain the symmetry. Then color it in. You can research "mandala" in Google Images to see some incredible images of this unique kind of geometric art.