Flip, Slide, Turn

Common Core Standard: 8.G.A.1- Verify experimentally the properties of rotations, reflections, and translations.

Introduction: Welcome to Flip, Slide, Turn, the game that turns math into dance moves! The goal of the game is to use rigid transformations in order to move across the coordinate plane and end up in the middle of the dance floor. Details will be found on your team's cell phone but first let's get you set up to play the game.

You will need:

- One Giant Coordinate Plane (at least 20ft x 20ft)
- Team Number Cards
- Coordinate Plane Markers - J/ I/ G/ Y
- Different Color Sticky Note for Each Team (to keep track of their last point)
- One Cell Phone per Team
- One piece of Patty Paper per Team
- One Coordinate Plane Worksheet per Team
- One Pencil per Team
- Optional: The song "Getting Jiggy Wit It" by Will Smith or Other Music
- Optional: Warm- Up (Pre-Assessment) and Cool Down (Post- Assessment) for Each Student

Set-Up:

1) Set up the Giant Coordinate Plane in a space large. You will not only want space for the Giant Coordinate Plane but also space around the Giant Coordinate Plane for observers.
2) Place the following Coordinate Plane Markers on the Giant Coordinate Plane:
    a) J(7,7)
    b) I (-8,3)
    c) G(-4,-6)
    d) Y(6,-3)
3) Establish the number of players or teams. Have players/ team stand on the side of the Giant Coordinate Plane. Give each player/ team a Team Number Card:

    This game can be played by individuals or with teams. The maximum number of individual players is four. The maximum number of teams is four teams with three players on each team (twelve players total).

    Recommendation - For teams with three players, it is recommended that each team member takes one of the three following roles:

    a) **Dancer** - This player will be the main dancer on the dance floor and will represent the point on the coordinate plane.
    b) **Choreographer** - This player will be in charge of the cell phone and will be the one giving the directions to the Dancer.
    c) **Floor Manager** - This player will be in charge of the Coordinate Plane Worksheet and Patty Paper. They will need to work with the Dancer and Choreographer to make sure the Dancer is making the right move and landing on the correct point. Also, the Floor Manager is in charge of keeping track of each location. If you get lost or you forget your last point, ask the Floor Manager!
4) Hand each team (or individual player) ONE Cell Phone, ONE Coordinate Plane Worksheet, ONE piece of Patty Paper, and ONE Pencil.
5) Have each player/team log into Flip, Slide, Turn on the Wearable Learning Platform with their cell phones. The rest of the directions will be given to the players/ teams through this platform.

Final Recommendation: Play "Gettin Jiggy Wit It" by Will Smith or other music, as you try to dance your way across the coordinate plane!

Directions on the Wearable Learning Platform:

Welcome: Welcome to Flip, Slide Turn! The game where you dance across the coordinate plane…hope you brought your dancing shoes because we are about to get JIGGY WIT IT!

Purpose: Your goal is to be in the middle of the dance floor (0,0) by the end of the dance. In order to get to the middle of the dance floor, you will need to flip, slide, and turn to various points on the coordinate plane by following the instructions on your phone. If you make a mistake, don't worry! Just jiggy on back to the last point you were at and try again. Are you ready to Get Jiggy Wit It?

Team Number: I like that you are singing the song already! Alright! First, let's get into position. What is your Team Number?

Getting Players/ Teams into Position:
If players are just playing as individuals, then just have them type in their own names

Player/ Team 1 - Alright Team 1, let's get you into position! First, which team member has the longest hair? Type their name in:
Congratulations! You will be our dancer on the dance floor!So, get your dancing shoes on and head over to point (7,7).What letter marks your point? J

Player/ Team 2 - Alright Team 2, let's get you into position! First, which team member has the shortest hair?Type their name in:
Congratulations! You will be our dancer on the dance floor! So, get your dancing shoes on and head over to point (-8,3). What letter marks your point? I

Player/ Team 3 - Alright Team 3, let's get you into position! First, which team member is the oldest? Type their name in:
Congratulations! You will be our dancer on the dance floor! So, get your dancing shoes on and head over to point (-4,-6). What letter marks your point? G

Player/ Team 4 - Alright Team 4, let's get you into position! First, which team member is the youngest? Type their name in:
Congratulations! You will be our dancer on the dance floor! So, get your dancing shoes on and head over to point (6,-3). What letter marks your point? Y

Practice Moves
Flip/ Reflection: Excellent! Now that your dancer is in position, let's practice some moves before we really hit the dance floor. Our first move on this dance floor is called a FLIP (no gymnastics required, we swear!). Flips simply require you to jiggy on over to another side of the dance floor by "flipping" (aka reflecting) over the y-axis, the x-axis, y=x (the positive diagonal) or y=-x (the negative diagonal). The key is that you need to land on the same point but on the other side of the dance floor. Are you ready to try? Flip over the y-axis! What is your new location? Remember to type your location as a point like (x,y). No spaces and remember to include negatives if necessary.

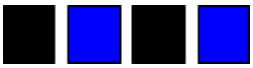
Practice Moves Continued
Slide/ Translation: Now let's SLIDE! Sliding (aka translating) is just moving left, right, up or down on the coordinate plane. Now let's get you slidin'! Dancer, position yourself so that you are facing the top of the coordinate plane (but be careful not to move off of your original point!).
Now, slide X units to the left/ right and X units up/ down (different teams will have different translations). What is your new location?

Turn/ Rotation: OK, time for your final dance move! Let's learn how to TURN! Turning (aka Rotating) is a quick dance move to get from one quadrant to the next but it is a bit tricky. For this game, we are only going to be turning around the origin (0,0), either clockwise or counterclockwise. So think of a record spinning from its center point. Now, imagine you are a little dot sitting at the outer edge of that record. As the record is turning, it is moving you in one big circle, around and around and around and around and

around…AH!!! Don't get sick on me! OKay, so there are four opportunities for you to jump off this turning record but you have to think about where you are landing. Turning 90 degrees means that you are jumping off immediately into the next quadrant.Turning 180 degrees means that you are only going halfway around the circle, so you should land in the quadrant diagonal from where you started. Turning 270 degrees means that you are jumping off after turning through three quadrants.
Turning 360 degrees means you are traveling full circle, and you should land at the exact point you started at. Ready to give it a try? Turn 180 degrees counterclockwise/ clockwise around the origin! What is your new location? Remember to type your location as a point like (x,y). No spaces and remember to include negatives if necessary.

Game Start: Excellent! Now that you have your dance moves, it's time to FLIP, SLIDE, TURN!
Remember, your goal is to end up in the middle of the dance floor (0,0) by the end of the dance!
When you are ready to GET JIGGY, tap the color code into your phone:

This game can be played either at a leisurely pace or as a race. To make it a leisurely pace, just have the players/ teams tap in the color code whenever they are ready. To make the game into a race, have all players/ teams input the color code at the same time.

Color Code: 

Team Number Cards

Team 1

Team 2

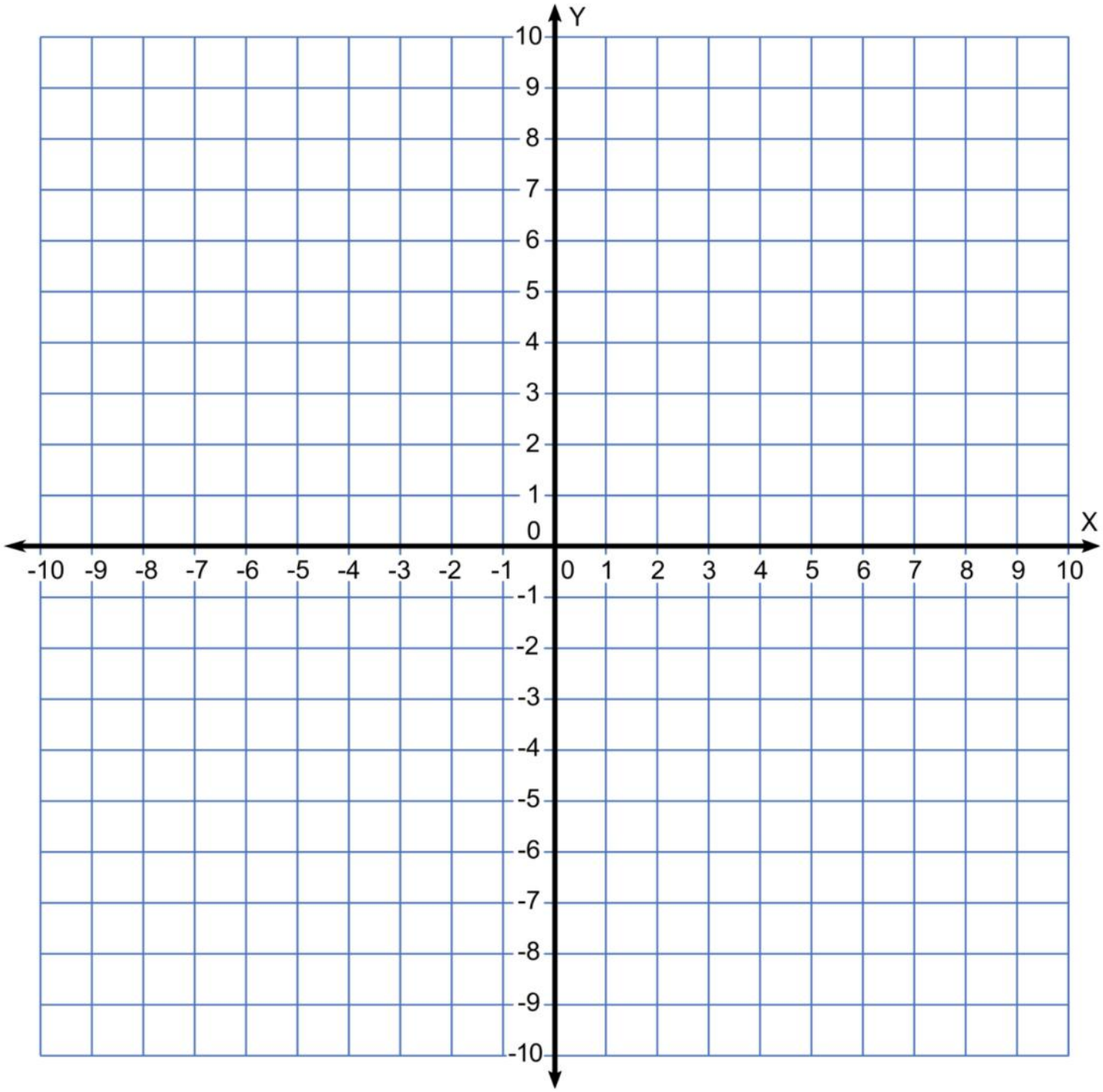
Team 3

Team 4

Coordinate Plane Markers

J (7,7)	**I** (-8,3)
G (-4,-6)	**Y** (6,-3)

Coordinate Plane Worksheet



Name: **Grade:** **Date:**

Warm-Up

Given the point W, located as shown in the diagram:

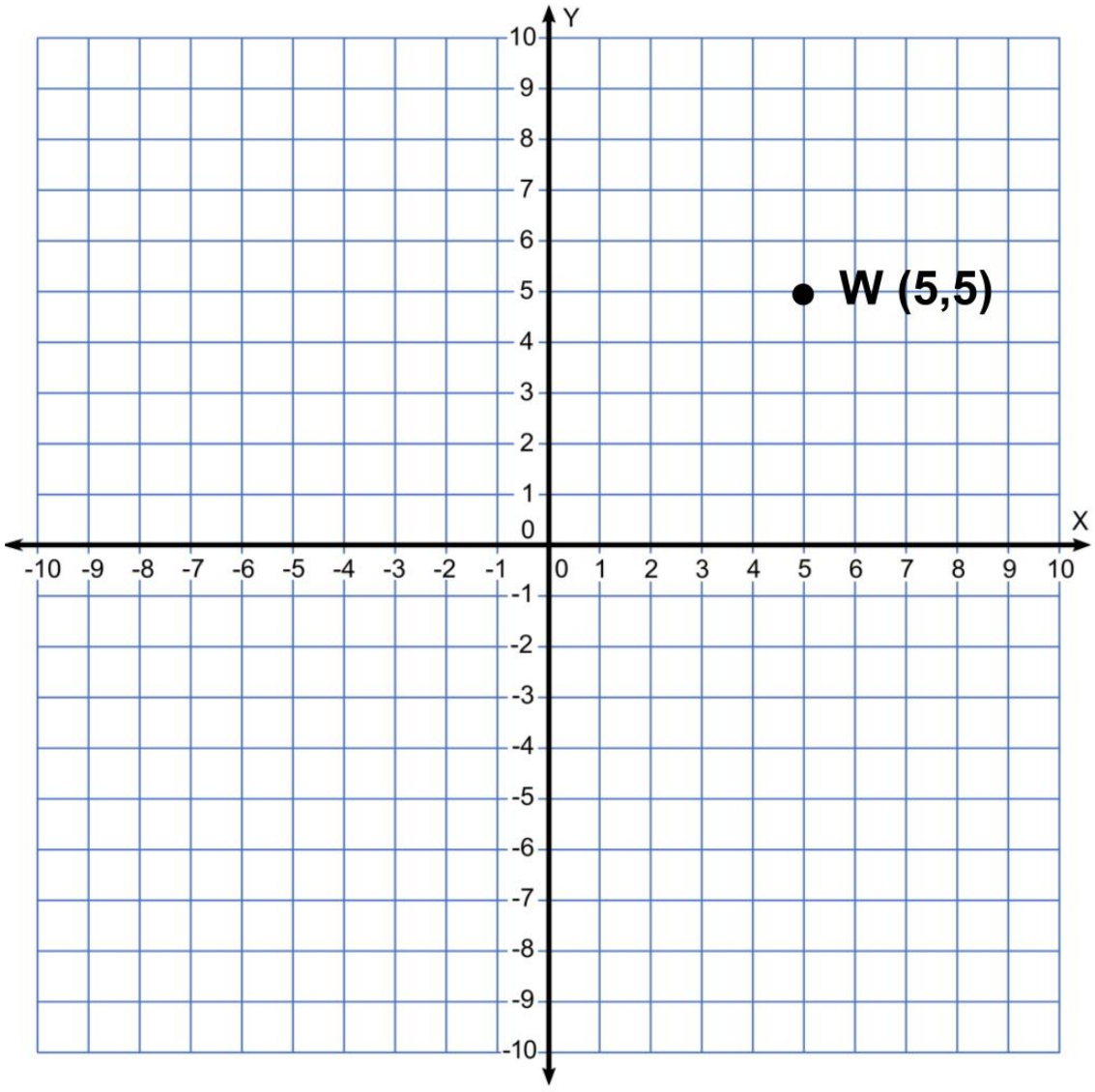
1. Reflect W over the y-axis. Graph the point and label it W'. What are the coordinates of W'?

2. Rotate W' 180 degrees clockwise around the origin. Graph the point and label it W''. What are the coordinates of W''?

3. Translate W'' 2 units to the left and 2 units up. Graph the point and label it W'''. What are the coordinates of W'''?

4. Reflect W''' across the x=y axis. Graph the point and label it W''''. What are the coordinates of W''''?

5. Rotate W'''' 90 degrees counterclockwise around the origin. Graph the point and label it W'''''. What are the coordinates of W'''''?



Name: **Grade:** **Date:**

Cool Down

Given the point C, located as shown in the diagram:

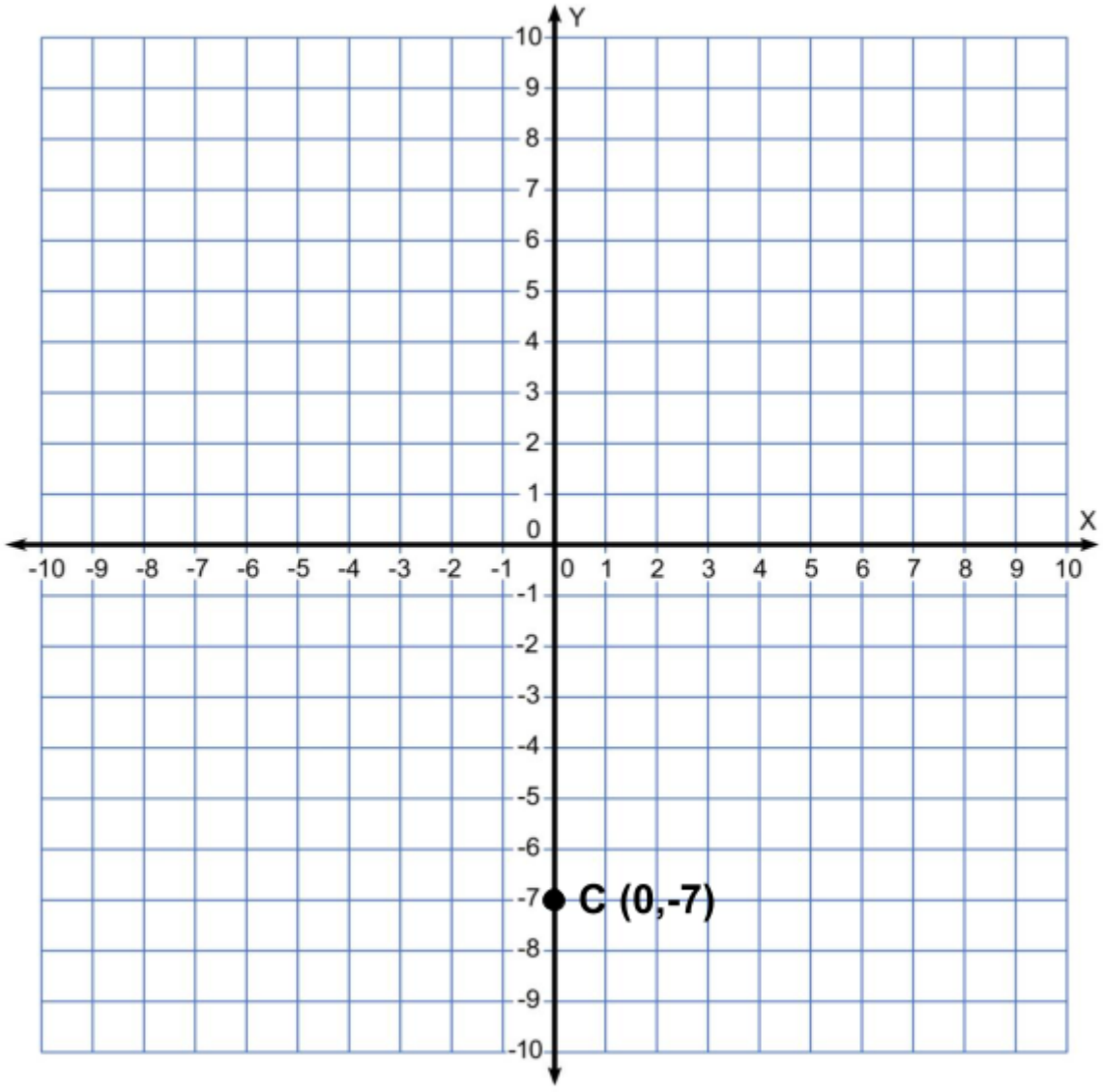
1. Translate C 7 units to the right and 3 units up. Graph the point and label it C'. What are the coordinates of C'?

2. Reflect C' over the x-axis. Graph the point and label it C''. What are the coordinates of C''?

3. Reflect C'' over -x=y. Graph the point and label it C'''. What are the coordinates of C'''?

4. Rotate C''' 270 degrees clockwise around the origin. Graph the point and label it C''''. What are the coordinates of C''''?

5. Translate C'''' 4 units to the left. Graph the point and label it C'''''. What are the coordinates of C'''''?



Answer Key

Team 1	Team 2	Team 3	Team 4
J(7,7) Reflect y-axis	I(-8,3) Reflect y-axis	G(-4,-6) Reflect y-axis	Y(6,-3) Reflect y-axis
J1(-7,7) 2 left, 2 up	I1(8,3) 4 left, 3 up	G1(4,-6) 3 left, 1 up	Y1(-6,-3) 4 right, 1 up
J2(-9, 9) 180 counterclockwise	I2(4,6) 180 counterclockwise	G2(1,-5) 180 clockwise	Y2(-2,-2) 180 counterclockwise
J3(9,-9) 5 left, 6 up	I3(-4,-6) Reflect x-axis	G3(-1,5) 7 right, 2 down	Y3(2,2) 9 left, 7 down
J4(4,-3) Reflect x-axis	I4(-4,6) 180 clockwise	G4(6,3) 180 clockwise	Y4(-7, -5) Reflect x-axis
J5(4,3) 180 clockwise	I5(4,-6) 2 left 5 up	G5(-6,-3) Reflect x-axis	Y5(-7,5) 180 clockwise
J6(-4,-3) 90 counterclockwise	I6(2,-1) 90 counterclockwise	G6(-6,3) 90 clockwise	Y6(7,-5) 90 clockwise
J7(-3,4) 3 right 3 down	I7(1,2) 2 left, 2 down	G7(3,6) 2 left, 6 down	Y7(-5, -7) 5 right, 6 up
J8(0,1) 8 left 3 down	I8(-1,0) 6 left, 8 down	G8(1, 0) 8 right, 2 down	Y8(0,-1) 4 right, 10 up
J9(-8,-2) 270 clockwise	I9(-7, -8) 270 counterclockwise	G9(9, -2) 270 counterclockwise	Y9(4, 9) 270 clockwise
J10(2,-8) Reflect x-axis	I10(-8,7) Reflect x=y	G10(-2, -9) Reflect y-axis	Y10(-9,4) Reflect y-axis
J11(-2,-8) 5 left, 2 up	I11(7,-8) 180 clockwise	G11(2,-9) 3 right, 4 up	Y11(9, 4) Reflect -x=y
J12(-7,-6) Reflect -x=y	I12(-7,8) Reflect x-axis	G12(5, -5) Reflect x=y	Y12(-4,-9) 90 counterclockwise
J13(6,7) 6 left, 7 down	I13(-7,-8) 7 right, 8 up	G13(-5,5) 5 right, 5 down	Y13(9,-4) 9 left, 4 up
End (0,0)	End (0,0)	End (0,0)	End (0,0)