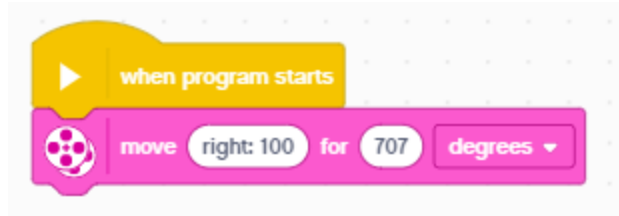


2. Precise Turns

Changing the direction of a robot's driving path is essential when navigating around an area. Your mission is to program your robot to rotate at every angle desired with the maximum precision possible without using sensors.

CREATE THE PROGRAM ON THE SOFTWARE:



Set bot on position 2 on mat 2, facing “0/360” and run.

1. How many degrees are the bot's wheels programmed for?
2. Which direction did your bot turn, clockwise or counterclockwise?
3. How many degrees did your bot turn according to the mat?
4. What are some factors that might change the rotation of the bot, programmable and non-programmable?

CONTEMPLATE AND MODIFY

Rebuild your program to make your robot do the following:

- Point turn clockwise for 90 degrees
 - Point turn counterclockwise for 90 degrees
1. To get the bot to turn 90 degrees, how many degrees did you need to turn the wheels?

2. Why is the degree input of the Move Block not the same degree spin of the robot?

NOW...figure out how many degrees of rotation of the wheel is needed to complete the degrees rotations of the bot below. Is there a formula for figuring it out? Can you predict the robot's wheel rotations?

Degrees of Bot	Predicted Wheel Degrees	Actual Wheel Degrees
75 degrees clockwise		
225 degrees clockwise		
15 degrees clockwise		

So, is there a way for you to figure out (within a few degrees) how to get rotational degrees to wheel degrees?

ROTATIONAL CHALLENGE

Create a new program to move your robot from start position 3 via position 3.1 (must stop at 3.1) to end position 3.2, **using only turns**. When you are ready, test your program using start position 3 on **mat 3** and document your result. Wheels go in the grey boxes with the metal ball starting at the red mark labeled 3. Record your exploration on the next page.

1. **Write a short description, including diagrams, of your program solution and the turns you made.**