

Name _____ Date _____

Activities adopted from Carnegie Mellon Robotics Academy *Robotics Engineering, Volume 1*.

1. What is the robot looking for?
 - a. Which way should it go when it sees light? Why?
 - b. Which way should it go when it sees dark? Why?

2. Classify each of the following light sensor values as “light” or “dark,” using the threshold value you calculated for your light sensor.
 - a. 34
 - b. 78
 - c. 51
 - d. 40

3. Using your own calculated threshold, describe the motion that the robot will make when the light sensor reads:
 - a. 27
 - b. 38
 - c. 91
 - d. 45

4. Christine writes this program one afternoon, tests it, and finds that it tracks a line well. However, when she comes back the next morning, it doesn’t work! She places her robot on the line and runs the program, but to her surprise, the robot only swing-turns to the right in a circle the whole time.

Explain what the cause of this problem is, your reasoning for why this is the case, and what needs to be done to fix it. If you don’t have any idea what could be wrong, explain instead what steps you would take to help Christine find and fix the issue. For each step, explain how and why you would take that step.

5. Imagine that instead of dark tape on a light surface, your classroom has dark surfaces with light tape on them.

a. Would the robot be able to follow the line using your same program?

b. Would it behave exactly the same, or slightly differently? Explain.

6. Now think about the physical placement of your light sensor on the robot.

a. Is the placement of the light sensor important?

b. What happens if you raise or lower the light sensor?

c. What happens if you place it in the rear of the robot instead of the front,

7. What happened when you tried to increase the speed with the original light sensor positioning?