Race to Tie Calendar (90 min block)

Week	Mon	Tues	Wed	Thur	Fri	
1	1. Entry Doc 2. Collect data from teacher car. 3. Begin Part 1 data analysis	1. Review linear functions – tables, graphs and equations (Function Flyer Applet) 2. Finish Part 1 data analysis.	1. Warm-up Review of project to date Ask students: "What is next?" 2. Linkbot Car: - py code - ch code 3. Linkbot Car data collection and analysis.	1. Finish data collection and analysis. 2. Figure out starting position.	1. Go through rubric. 2. Gather and organize materials for portfolio and prepare for presentation.	
2	1. Presentations 2. Race 3. Finish portfolio 4. Reflection (rubric)	1. Assessment				
3						

Race to Tie:

Dear Students,
I just got this cool little car and want to race it in the classroom. The problem is, it really isn't fair that mine is a racecar and yours is just a little robot. To give you a chance of winning I will change the rules of the race. In this race your robot car will have to tie mine. You may start your car from wherever you would like.
Since how fast your Linkbot car is does not matter in the race, I will assign each team a speed. Even with the new race rules, I am still a little nervous about beating you so each team must show that their Linkbot car placement will result in a tie, the presentation must include:

- A name for your Linkbot car.
- A graph showing your car's motion.
- The velocity for your car.
- The placement of your car in the race so that it will tie the pace car.
- The final equation for your car.

After I am satisfied, each team will have two chances to tie my car.

Sincerely,
Your Teacher

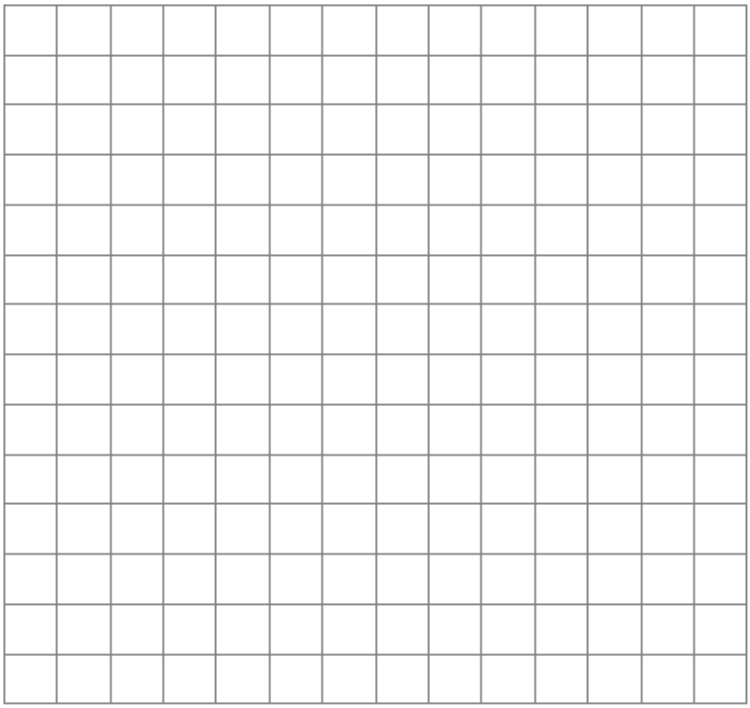
Know	Need to Know	Next Steps

Name:_____ Date:_____

Race to Tie - Teacher's Car

Data:

Graph:



1. What is the equation for the car?

2. How did you find the equation?

3. What does the slope mean?

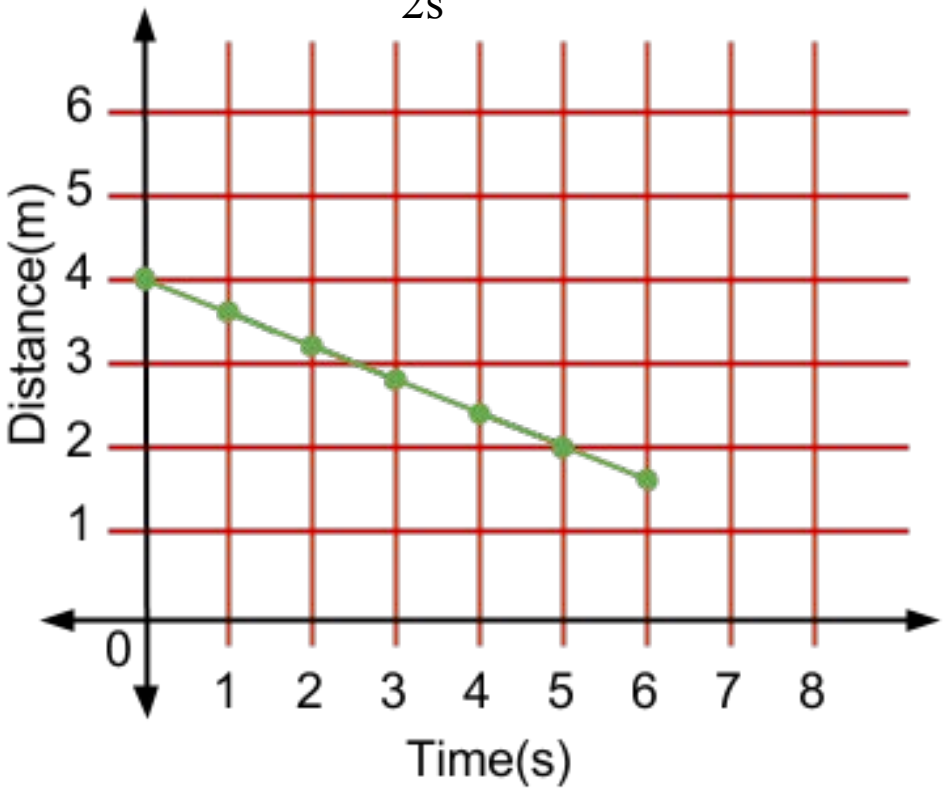
4. How far will the car go in 3.5 seconds?

5. How long will it take for the car to go 5 meters?

Warm-up: Find the Error

A student made 1 mistake below, find and correct the mistake.

1. The rule is: $4\text{m} - \frac{5\text{m}}{2\text{s}} \cdot x = y$



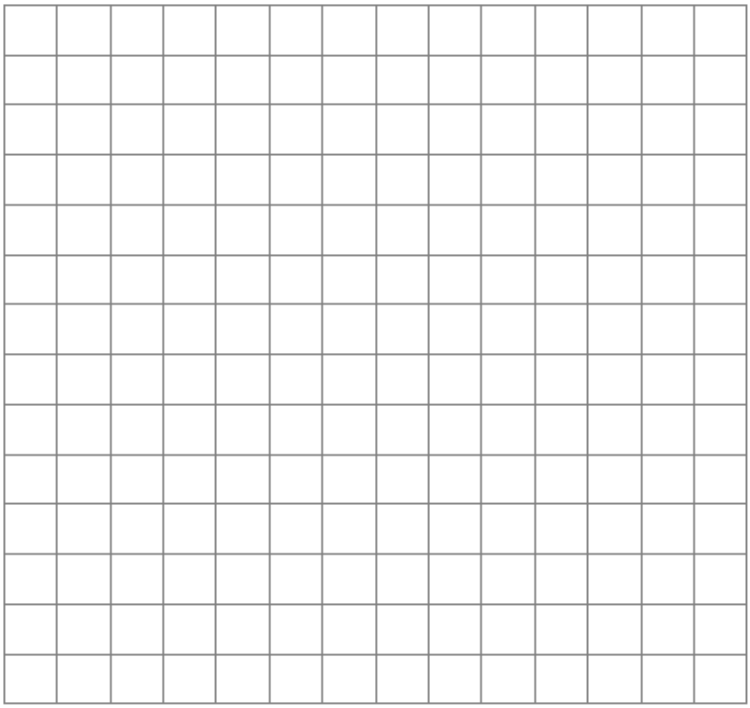
Race to Tie - Linkbot Car

Name:_____ Date:_____

Your assigned speed is _____.
The code for changing your Linkbot car's speed is: robot.setJointSpeeds(*speed*, 0, *speed*)

Data:

Graph:



1. What is the equation for the car?

2. How did you find the equation?

3. What does the slope mean?

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Race to Tie Rubric

STUDENT: _____

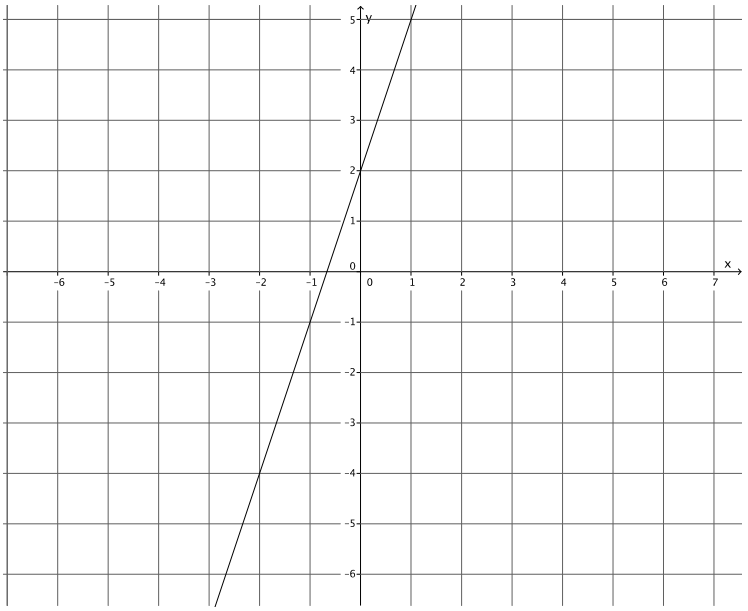
EVALUATOR: _____ DATE: _____

CRITERIA	UNSATISFACTORY (Below Performance Standards)	PROFICIENT (Meets Standards)	ADVANCED (Demonstrates Exceptional Performance)
Portfolio An organized collection of work from the project.	Fails to meet any of the *Proficient* descriptors Potential Pitfalls: • Fails to take into account the different starting position. • Graphs are sloppy, difficult to read, mislabeled, or lack labels. • Not all group members participate in exploration. • Did not include all work. • Majority of calculations incorrect. 0 - - - - - - - - - - - - 8 - - - - - - - - - - - - 16	• Includes all major work for the project (data sheets, graphs, etc) **<u>and you…</u>** • List the car's name • Provide an accurate graph of the race showing each car's motion an where they tie • Calculate the velocity of each car • Calculate the placement of your car so it will tie the pace car • Show the final equation for your car. 17 - - - - - - - - - - - - 19 - - - - - - - - - - - - 21	In addition to meeting the PROFICIENT criteria… • All graphs are easy to read • All calculations are correct 23 - - - - - - - - - - - -24 - - - - - - - - - - - - 25
Presentation Students should explain the big ideas of their project.	Fails to meet any of the *Proficient* descriptors. Potential Pitfalls: • Not all group members participate in presentation. • Group is not engaged in other group's presentations. • Body language and delivery is somewhat unprofessional. 0 - - - - - - - - - - - - 8 - - - - - - - - - - - - 16	• Methodology for each calculation is accurately and clearly explained • Accurately addresses questions posed • Majority of calculations correct – no major procedural errors • Conduct a professional presentation: a. Maintain eye contact with audience b. Maintain appropriate volume and inflection c. Use appropriate gestures d. Exercise good timing; Avoid awkward pauses e. Presentation is relevant; does not exclude any required information 17 - - - - - - - - - - - - 19 - - - - - - - - - - - - 21	In addition to meeting the PROFICIENT criteria… • During presentation explained why the graph is a straight line. • During presentation, can verbally relate how to find slope with what the slope means. • All graphs are easy to read. • All calculations are correct. 23 - - - - - - - - - - - -24 - - - - - - - - - - - - 25
Race Tolerance measured when pace car completes the race.	Fails to meet any of the *Proficient* descriptors Potential Pitfalls: • Starts car too early. • Calculations incorrect. • Did not measure properly. 0 - - - - - - - - - - - - 2 - - - - - - - - - - - - 4	• The car is within 5 to 7 inches of the finish line when the teacher car finishes in first or final heat. 5 - - - - - - - - - - - - 6.5 - - - - - - - - - - - - 8	In addition to meeting the PROFICIENT criteria… • The car is within 0 to 3 inches of the finish line when the teacher car finishes in either heat • The car is within 5 to 7 inches of the finish line when the teacher car finishes in both first and final heats. 9 - - - - - - - - - - -9.5 - - - - - - - - - - - - 10

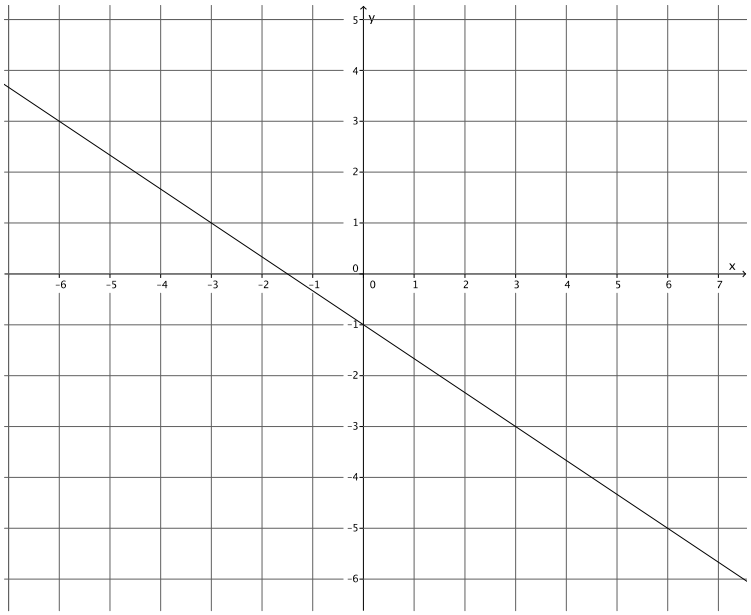
Final Reflection How they did and what they might do better next time.	Fails to meet any of the *Proficient* descriptors Potential Pitfalls: • Student does not accurately describe the difficulties • Sentences are not complete • Reflection does not address problem solving strategies • Ignores possible ways to improve results. 0 - - - - - - - - - - - - 2 - - - - - - - - - - - - 4	• Student describes the math they learned and the difficulties they encountered • Reflection explains some of the problem solving strategies used • Discusses possible ways to improve 5 - - - - - - - - - - - - 6.5 - - - - - - - - - - - - 8	In addition to meeting the PROFICIENT criteria… • Student expresses the reasons behind the difficulties encountered by other groups as well as their own • Thoughtful and well written complete sentences a. Response is supported by examples and personal reflections b. Illustrates a complex and important issue and simplifies it c. No grammatical or spelling errors • Specific examples of how you could improve your results? 9 - - - - - - - - - - -9.5 - - - - - - - - - - - - 10

COMMENTS:

1. Write the equation that represents the line shown.



2. Write the equation that represents the line shown.

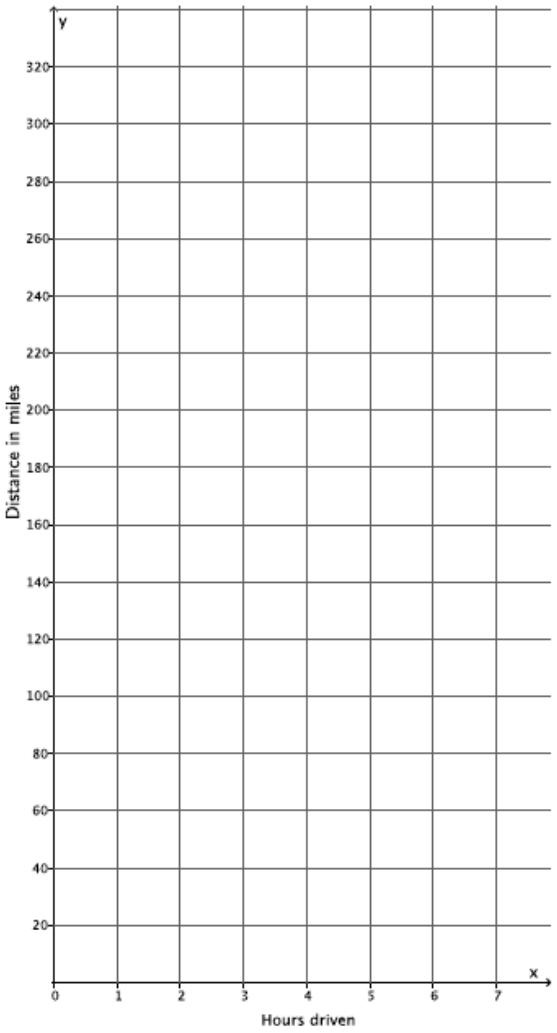


3. A group of friends are on a road trip. So far, they have driven 120 miles. They continue their trip and drive at a constant rate of 50 miles per hour.

   a. Let y represent the total distance traveled in x hours. Write an equation to represent the total number of miles driven in x hours.

   b. Identify the slope and the y-intercept. What do these numbers represent?

   c. Graph the equation on the given coordinate plane.



   d. Could any other line represent this situation? For example, could a line through point $(0, 120)$ with slope 75 represent the total distance the friends drive? Explain.

   e. How long would you estimate they had been driving to reach the first 120 miles? Explain.

   f. How long will it take them to drive 420 miles? Explain.