

BOAT LAB ASSIGNMENT

Part 1: Tracking Motion of the Row Boat

1. Open the program
2. Leave all the parameters the same for the first round of this experiment.
3. Click start. The timer will start immediately even though Eileen has not yet reached the start line of the race course. When you record your time values, you want to record the total time on the water. So at position zero meters, your time will NOT be zero.
4. Pause the program when the nose of the boat hits each of the designated distances in the table below. Record the time as displayed on the program.

TIME (S)	POSITION (M)
	0
	25
	50
	75
	100
	125
	150
	175
	200

Part 2: Changing one parameter.

1. Click on the paddle button to set the initial parameters for Round 2 of the experiment (Paddle Period, Paddle Strength, Combined Mass, River Current). For this part of the lab, you will be picking **one and only one** of the parameters and running a trial to see how this parameter affects the slope of the boat's graph. Make sure all your other parameters remain constant for the rest of this lab.

TIME (S)	POSITION (M)
	0
	25
	50
	75
	100
	125
	150
	175
	200

LESSON 3

2. Label both your tables, like "Gentle Current" or "Herculean Paddling" or "0.5 s Paddle Period" or "100 kg mass."

Trial 1 y-intercept _____

Trial 1 slope _____

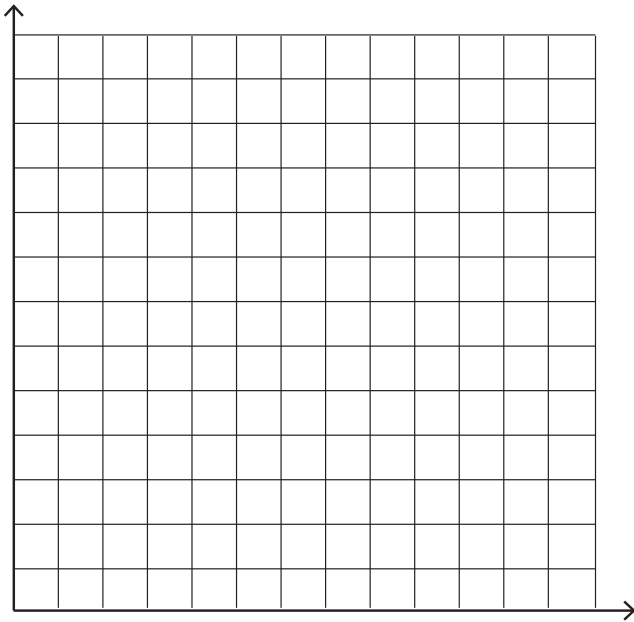
Trial 1 equation (slope intercept form) _____

Trial 2 y-intercept _____

Trial 2 slope _____

Trial 2 equation (slope intercept form) _____

3. After you have collected data for both trials, use the graphing tool in modelbook to help you make a graph with both data sets. Make sure all your data is displayed and properly labeled on one graph so you can compare the lines.



4. When you are done, take a screenshot of your table and graph. Add it to your group's whiteboard.

Help with Functions

In this homework, you will be solving functions and helping to teach Cobi, a life-like robot, about the following math problems.

Problem 1

Instruction: For this problem, write how you would explain to Cobi how to solve the problem.

In preparing for camping, Cobi's friends Tasha and Zach have been arguing over who is better at making s'mores. Tasha has suggested that they use math to figure out who is fastest. Tasha already has a function for how quickly she can make s'mores. It is given below. Help Cobi make a function for Zach given that we know how many minutes it takes him to make 9 s'mores and it takes 1 minute for him to set up.

Step	S'more Maker	Minutes (y)	S'mores (x)	Set-up (b)	Slope (m)
0	Tasha	8	2	4	2
1	Zach	9	2	1	???

Solution

Step	S'more Maker	Minutes (y)	S'mores (x)	Set-up (b)	Slope (m)
0	Tasha	8	2	4	2
1	Zach	9	2	1	4

$$y = mx + b$$

Tasha's equation: $y = 2x + 4$

For Zach's equation...

$$y \text{ minutes} = m \times (x \text{ s'mores}) + 1 \text{ minute for}$$

$$9 \text{ minutes} = m \times (2 \text{ s'mores}) + 1 \text{ minute}$$

$$9 - 1 = m \times 2$$

$$\frac{8}{2} = \frac{m \times 2}{2}$$

$$4 = m$$

$$m = 4 \text{ minutes per s'more}$$

So the equation for Zach's time is $T=4s + 1$, when T stands for the amount of time, in minutes, it takes for them to make all the s'mores, and s stands for the amount of s'mores they are making.

Explanation

Write your explanation here. Remember to use the Talk Moves in order to give a good explanation that might help Cobi learn how to solve the problem.

Problem 2

Instruction: For this problem, Cobi wants to use the equation to figure out how long it takes Tasha and Zach to make 10 s'mores each. Help Cobi fill in how long it takes Tasha to make different amounts of s'mores.

Step	S'more Maker	Amount of S'mores (s)	Time (T)
0	Tasha	$s = 0$	4
1	Tasha	$s = 10$	

Using Tasha's equation of: $T = 2s + 4$

Step Zero: $T = 2(0) + 4$

$$T = 4$$

Step One: solve for $s = 10$

It takes Tasha _____ minutes to make ten s'mores

Problem 3

Instruction: For this problem, Cobi wants to compare how quickly Tasha and Zach can make s'mores. Help Cobi figure out how long it takes Zach to make 10 s'mores using Zach's equation.

Step	S'more Maker	Amount of S'mores (s)	Time (T)
0	Zach	$s = 0$	1
1	Zach	$s = 10$	

Using Zach's equation of: $T = 4s + 1$.

Step Zero: $T = 4(0) + 1$

Step One: Solve for $s = 10$

It takes Zach _____ minutes to make ten s'mores

Part 4

Instruction: For this problem, write how you would explain to Cobi how to solve the problem.

When Cobi gets older, he wants to work as a camp counselor like his older brother and sister, Benji and Daisy! Benji and Daisy worked at different camps and, therefore, made different salaries. Over dinner one night, Cobi wanted to see which camp, Benji's or Daisy's, pays best. All the information Benji and Daisy could remember is listed below. Help Cobi make a function for Daisy's summer pay as a camp counselor using the information given.

Step	Counselor	Money Earned (y)	Weeks (x)	Summer Bonus (b)	Weekly Pay (m)
0	Benji	\$500	7	\$115	\$55
1	Daisy	\$700	12	???	\$40

Solution

Step	Counselor	Money Earned (y)	Weeks (x)	Summer Bonus (b)	Weekly Pay (m)
0	Benji	\$500	7	\$115	\$55
1	Daisy	\$700	12	\$220	\$40

$$y = mx + b$$

Benji's equation: $y = 55x + 115$

For Daisy's equation....

$$y \text{ dollars} = (m \text{ dollars per week}) \times (x \text{ weeks}) +$$

$$700 \text{ dollars} = (40 \text{ dollars per week}) \times (12 \text{ week})$$

$$700 = 480 + b$$

$$220 = b$$

$$b = \$220 \text{ summer bonus}$$

So the equation for Daisy's summer pay is $\mathbf{P} = 40\mathbf{w} + 220$, where \mathbf{P} stands for the amount earned in a summer, in dollars, and \mathbf{w} stands for the number of weeks worked.

Explanation

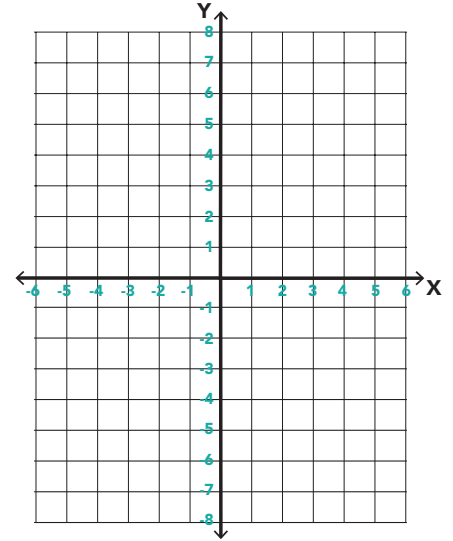
Write your explanation here. Remember to use the Talk Moves in order to give a good explanation that might help Cobi learn how to solve the problem.

INTRO TO SLOPE INTERCEPT FORM ASSIGNMENT

<https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-linear-equations-functions/intro-slope-intercept-form/v/slope-intercept-form>

1. Graph the equation $y=3x + 4$

a. What is the slope of that equation? How do you know?



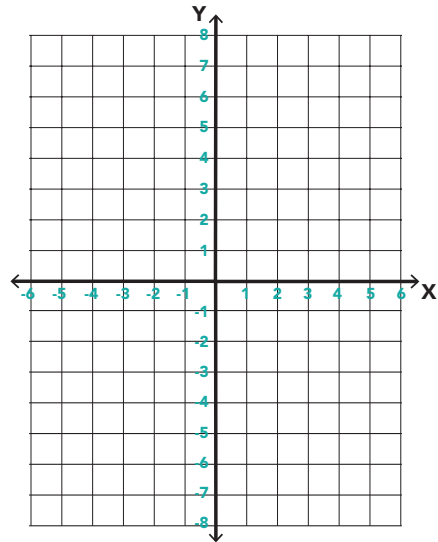
b. What is the y-intercept? What does the y-intercept mean?

2. Use the table to answer the following questions.

X	Y
0	7
1	9
2	11
3	13

LESSON 3

Create a graph using the data from the table.



a. What is the slope?

b. What is the y-intercept?

c. Write the equation of this line.