

Miles From Home

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Activity overview

The students will use their calculator to find the slope between subsequent points and discuss the meaning of slope in the context of the problem.

Concepts

Slope, line segment, measure

Teacher preparation

See below

Classroom management tips

Small groups of 3 or 4 will help as the students are good at explaining how to use the technology to each other.

TI-Nspire Applications

Spreadsheets, graphs, and creating line segments and measuring slope.

Step-by-step directions

Scenario

At 3pm on Monday, Leslie finds herself 35 miles away from home. Fifteen minutes later, she is at the grocery store, which is 5 miles closer to home. She stays there for a half hour and then leaves to go to Home Depot. It takes her fifteen minutes to arrive at HD, which is 45 miles from her home. She stays there for 15 minutes (buying way too much stuff) and then leaves to go home, which takes her 25 minutes.

Instructor Set up

You will be using the spreadsheet and the graphing screens simultaneously. So, the first step will be to set up the two screens.

1. Control, house (to get the tool key)
2. Go down to 6:Page layout, select page layout, and go to 2: layout 2.
3. Hit menu, 2: Add Graphs & geometry, hit menu again, go down to 3: graph type, 3: scatter plot.
4. Hit CTRL tab to get to second screen.
5. Hit menu 3: lists & spreadsheets
6. Enter data into column A. Then using the donut, go next to the A and type “minutes” hit enter.
7. Enter data into column B. Then using the donut, go next to the B and type “miles” hit enter.
8. Hit CTRL tab to return to graph.
9. Under the x <- choose minutes (enter) hit tab.
10. Under the y <- choose miles (enter) hit tab.
11. Under menu, go down to 9: zoom stat.

Once the program is set up, you can transfer it to the classroom set. This will enable the students to complete the rest of the activity and have discussion on the meaning behind the mathematics, rather than on the set up of the activity.

Assessment and evaluation

In Class Activity

Meaning of Slope

At 3pm on Monday, Leslie finds herself 35 miles away from home. Fifteen minutes later, she is at the grocery store, which is 5 miles closer to home. She stays there for a half hour and then leaves to go to Home Depot. It takes her fifteen minutes to arrive at HD, which is 45 miles from her home. She stays there for 15 minutes (buying way too much stuff) and then leaves to go home, which takes her 25 minutes.

1. Create a table that illustrates Leslie's time and distance from home.

Get program from the TI-nspire by following the steps below:

1. Hit the house key. Hit 6, and using the donut scroll down to the program under "examples" titled "Miles From Home". Hit enter.

Find the slope between the subsequent points. Here's how:

1. Hit "menu", 6: points & lines, arrow over then down to 5: segment, hit enter.
2. Move the pencil so that it is on top of the first point (the point will flash) and hit enter. Repeat for the second point.
3. Hit "menu", 7: measurement, arrow over to 3: slope, hit enter.
4. Move the finger over to the line and you'll see the slope. Hit enter to place the slope value on the graph.
5. Repeat the process.

Describe what each slope means in the context of the problem (you should have 5 to discuss):

In Class Activity (answer key)

Meaning of Slope

At 3pm on Monday, Leslie finds herself 35 miles away from home. Fifteen minutes later, she is at the grocery store, which is 5 miles closer to home. She stays there for a half hour and then leaves to go to Home Depot. It takes her fifteen minutes to arrive at HD, which is 45 miles from her home. She stays there for 15 minutes (buying way too much stuff) and then leaves to go home, which takes her 25 minutes.

2. Create a table that illustrates Leslie's time and distance from home.

Time in minutes (since 3pm)	Miles from Home
0	35
15	30
45	30
60	45
75	45
100	0

Get program from the TI-nspire by following the steps below:

2. Hit the house key. Hit 6, and using the donut scroll down to the program under "examples" titled "Miles From Home". Hit enter.

Find the slope between the subsequent points. Here's how:

6. Hit "menu", 6: points & lines, arrow over then down to 5: segment, hit enter.
7. Move the pencil so that it is on top of the first point (the point will flash) and hit enter. Repeat for the second point.
8. Hit "menu", 7: measurement, arrow over to 3: slope, hit enter.
9. Move the finger over to the line and you'll see the slope. Hit enter to place the slope value on the graph.
10. Repeat the process.

Describe what each slope means in the context of the problem (you should have 5 to discuss):

It takes Leslie $\frac{1}{3}$ miles per minute to get to the grocery store, she is travelling towards home. While she is at the grocery store, her distance from home stays constant and is represented by a slope of 0 (or 0 miles per minute). As she travels from the grocery store to home depot, she is travelling at a rate of 1 mile per minute, and is getting farther away from home. While she is in home depot, her distance from home stays constant (again, represented by a slope of 0 miles per minute). When she leaves home depot, she travels towards home at a rate of 1.8 miles per minute.