

## Slopes and Equations of Lines with GeoGebra

Student Name(s): \_\_\_\_\_

### Introduction

Today you are going to review how to calculate the slope of a line using 2 different methods. Then you will access the Internet and use a software tool for Geometry and Algebra called "GeoGebra" and calculate the slope of a line.

Access the Internet and type in <http://poster.4teachers.org/>.

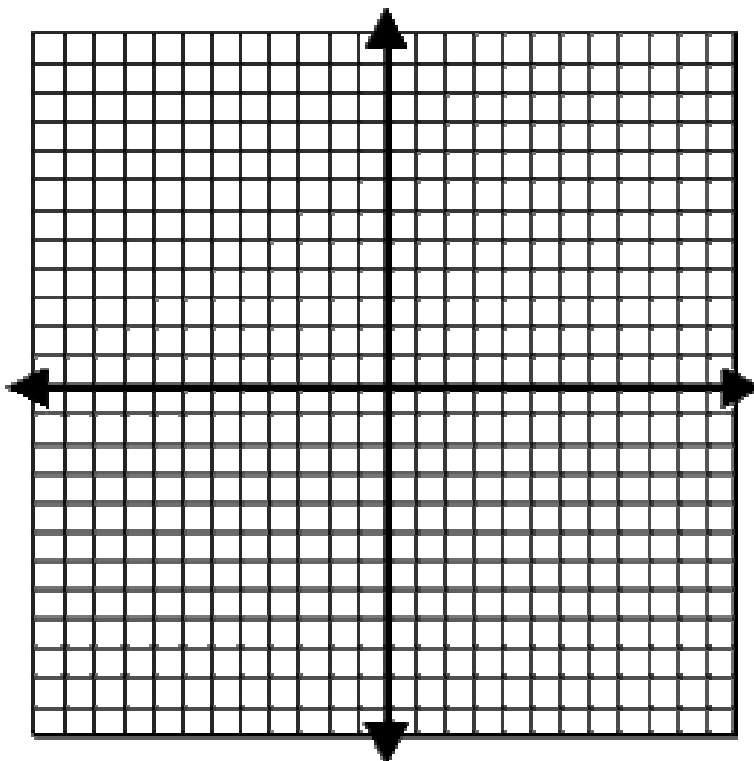
At the bottom right where it says "Search for Posters and Worksheets," click on the drop-down menu and select "**Worksheet ID**" and then key in 124003 as the worksheet code. Click "Search." Click on the ID 124003 on the Search Result page. This will bring up our online Student Directions Worksheet for this activity.

### LINEAR EQUATIONS - SLOPE

Let's review. [What is slope?](#)

Click on "Cool Math Dictionary - Slope" (<http://www.coolmath.com/reference/math-dictionary-S.html>) and click on "Slope of a Line" and read the definition of a slope of a line. After you are done reading the definition, click the BACK arrow TWICE to return to our Student Directions Worksheet.

Click on "Lesson 6" ([http://www.coolmath.com/algebra/Algebra1/06Lines/06\\_findingslopegraph.htm](http://www.coolmath.com/algebra/Algebra1/06Lines/06_findingslopegraph.htm)) and read further about slope. After lesson 6, graph the following points on the grid below: (0, -3) and (5, 4). Now find the slope using the RISE over RUN method as described in Lesson 6. (Note: Slope is not always a whole number). If you need more graph paper, click on "Graph Paper" and print. When you are done click the BACK arrow to return to the Student Directions Worksheet.



## Slopes and Equations of Lines with GeoGebra

Slope (m) = RISE/RUN = (\_\_\_\_\_/\_\_\_\_\_) =

Click on “Lesson 7” ([http://www.coolmath.com/algebra/Algebra1/06Lines/07\\_findingslope2points.htm](http://www.coolmath.com/algebra/Algebra1/06Lines/07_findingslope2points.htm)) and read even further about slope. Find the slope of the line containing the points (0, -3) and (5, 4) without using the graph paper.

- Find the change ( $\Delta$ ) in or difference between the y coordinate values:  $\Delta y = y(B)-y(A)$ .
  
- Find change ( $\Delta$ ) in or difference between the x coordinate values:  $\Delta x = x(B)-x(A)$ .
  
- Finally, find the slope:  $m = \Delta y / \Delta x$ .

When you are done click the BACK arrow to return to the Student Directions Worksheet.


Now let's have some fun with the software, “GeoGebra...”

# Slopes and Equations of Lines with GeoGebra


## Activity 1 - Generate a line - find whole number slope

Click on "Activity 1" (<http://mathcasts.org/gg/student/lines/slopes/slope1.html>)

1. Generate a line

- Click on **New Line**.
  - Click on the Move Drawing Pad icon  if you don't see the line properly! Then click anywhere by the line and drag it into a position you want.
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2. Choose 2 points on the line. Look for 2 points on the grid. Move the Drawing Pad again if necessary.

- Click on the Point icon. 
  - Click on the line to get point A on the line.
  - Click on the line again to get point B on the line.
  - Click on **Check Points**.
- 

3. Find the coordinates of A and B.

- Write these down: Point A (\_\_\_\_\_), Point B (\_\_\_\_\_)
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4. Find the slope of the line.

Okay, now you're ready to find the slope of our line. Refer back to the points you write down in #3 above and....

- Find the change in the y-values:  $\Delta y = y(B) - y(A)$ .
- Find the change in the x-values:  $\Delta x = x(B) - x(A)$ .
- Finally, find the slope:  $\Delta y / \Delta x$ .

It should be a whole number.


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5. Check your answer!

- Type the **slope of the line** in the box below.
- Then click on **Check Answer**.

**Slope of the line is:**

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- Click on Reset  in top right corner to start over.


When you are done click the BACK arrow to return to the Student Directions Worksheet.

## Slopes and Equations of Lines with GeoGebra


### Activity 2 - Generate a line – you find the slope (MORE PRACTICE)

Click on “Activity 2” (<http://mathcasts.org/gg/student/lines/slopes/slope2.html>)

1. Generate a line

- Click on **New Line**.
  - Click on the Move Drawing Pad icon  if you don't see the line properly 😊! Then click anywhere by the line and drag it into a position you want.
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2. Choose 2 points on the line. Look for 2 points on the grid. Move the Drawing Pad again if necessary.

- Click on the Point icon. 
  - Click on the line to get point A on the line.
  - Click on the line again to get point B on the line.
  - Click on **Check Points**.
- 

3. Find the coordinates of A and B.

- Write these down. A (\_\_\_\_\_), Point B (\_\_\_\_\_)
- 


4. Find the slope of the line.

- Find the change in the y-values:  $\Delta y = y(B) - y(A)$ .
  
  - Find the change in the x-values:  $\Delta x = x(B) - x(A)$ .
  
  - Finally, find the slope:  $\Delta y / \Delta x$ .
- 

5. Check your answer!

- Type the **slope of the line** in the box below as a fraction  $a/b$  or as a decimal rounded to 2 decimals.
- Then click on **Check Answer**.

Slope of the line is:

- Click on Reset  in top right corner to start over.

When you are done click the BACK arrow to return to the Student Directions Worksheet.

# Slopes and Equations of Lines with GeoGebra


## Activity 3 - You draw 2 points on grid and find the slope

Click on “Activity 3” (<http://mathcasts.org/gg/student/lines/slopes/slope3.html>)

1. Pick the location for your line.

- Click on the Move Drawing Pad icon .
  - Then click anywhere in the graph and drag it wherever you want. Keep the point (0,0) visible 😊
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2. Pick a first point A on your line.

- Click on the Point icon. 
  - Click on any grid point to get point A.
  - Write down the coordinates of A. ( \_\_\_\_\_ )
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3. Pick a second point B on your line.

- Click on any grid point **BUT** not on the same vertical or horizontal as point A. Why not??
  - Write down the coordinates of B. ( \_\_\_\_\_ )
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4. Check the coordinates.

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5. Draw the line.

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6. Calculate the slope of your line.


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7. Check your answer!

- Type the **slope of the line** in the box below as a fraction  $a/b$  or as a decimal rounded to 2 decimals.
- Then click on .

Slope of the line is:

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- Click on Reset  in top right corner to start over.

When you are done click the BACK arrow to return to the Student Directions Worksheet.

GOOD JOB! You have learned how to generate lines using the tool, GeoGebra, and how to calculate slope.