Math Man On The Slopes
ID: 11748

<div align="right">

Time required
15-30 minutes

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Activity Overview
In this activity, students will practice identifying slopes with informal pictures, and can self-check their understanding with one of the measurement tools. The students will also identify the slope and intercept of a given graph and will choose the correct equation in a multiple choice format.

Topic: Slope and Slope-intercept

- *Visual ideas about slope*
- *Finding the intercept*
- *Determining the slope*
- *Writing an equation from a line*

Teacher Preparation and Notes

- *Teacher preparation should include instruction about the basics of identifying positive and negative slopes, as well as intercepts. The students will need to have exposure and practice with the form $y = mx + b$, but can also gain confidence through self assessment items embedded in the file.*

- *Before beginning the activity, students should clear all lists and turn off functions. To clear the lists, press* 2nd [CATALOG] *and scroll down until the arrow is in front of* ***ClrAllLists***. *Press enter twice. To clear any functions, press* Y= *and then press* CLEAR *when the cursor is next to each Y= equation.*

- ***To download the student worksheet and calculator files, go to education.ti.com/exchange and enter "11748" in the keyword search box.***

Associated Materials

- *MathManOnSlopes_Student.doc*
- *MATHMAN, DIPPER, SLOPE (Cabri Jr. files)*
- *MathManOnSlopes_LrnChk.edc*

Suggested Related Activities
To download any activity listed, go to education.ti.com/exchange and enter the number in the keyword search box.

- *Slope Intercept Form (TI-84 Plus family with TI-Navigator) — 10624*
- *Exploring Slope Intercept Form of a Line (TI-84 Plus family with TI-Navigator) — 5094*
- *Using the Transform Application in an Algebra Class (TI-84 Plus family) — 6637*
- *How Many Drivers? Investigate the Slope Intercept Form of a Line (TI-84 Plus family) — 5650*


Problem 1 – Visually Estimating Slope

Students are introduced to the visual idea of slopes uphill and downhill as one might see when looking at a ski slope. With the Cabri Jr. file **MATHMAN** open, discuss with students where Math Man should ski. Ask questions of which lines are the steepest and have them discuss what impact this might have on his speed.
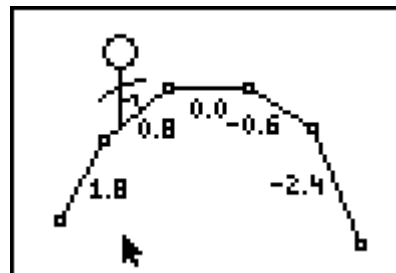
Math Man skis best on the slopes of –0.6 and –2.4.

With the file **DIPPER**, students will see a representation of the "Big Dipper", a formation commonly recognized in the night sky. Let students work in pairs to discuss which slope best fits each segment.
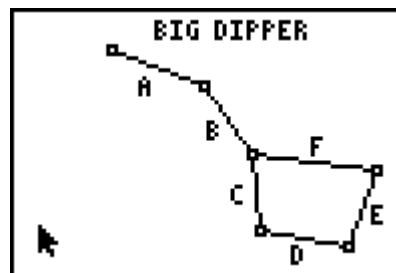

Helpful hint for students:
    Choose the most obvious answers first, and
    leave the "tricky" ones (A, D, and F) for last.

To check their answers, students can use the **Slope** tool (GRAPH > Measure > Slope). Move to a segment and when the arrow appears and the segment flickers, press ENTER.
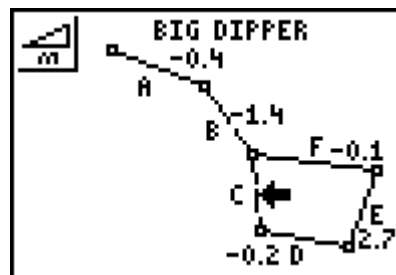

Problem 2 – Exploring Precise Slope

Students are given a line with 2 points. They are to move the point at (–2, 4) find a new line with one of the points (0, 3) remaining the same. The new line should have a slope of $\frac{2}{3}$. They can determine the slope by either looking at the slope triangle or by counting the spaces on the *x*- and *y*-axes (rise over run). Each space represents one unit.
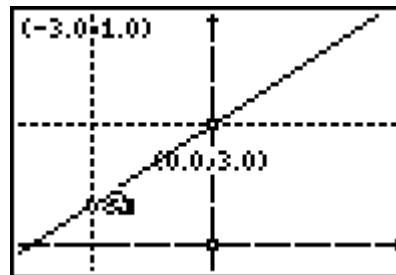
Facilitate a discussion on the methods used to determine where to move the point to make a slope of $\frac{2}{3}$. Also discuss the coordinates of the point, the *y*-intercept, and the equation of the line. Students should understand that no matter what point they choose to make the slope $\frac{2}{3}$, the equation will remain the same.

Students are to move the point at (0, 3) to (1, 0). They are to move the other point so the line has a slope of 1.

Ask students if their method of determining where to place the point changed. Challenge students to find another point that will give the same line.
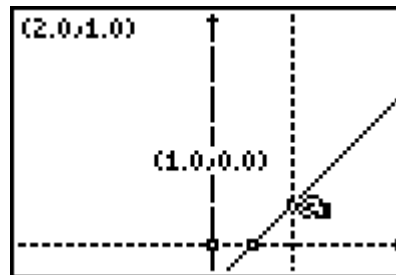
Problem 3 – Slope-Intercept Equation

This problem is intended for students to tie everything, slope, *y*-intercept, and equation, together.

The first question asks students to identify the slope of the line. Students can use the grid to count the slope triangle in the form of "rise over run" or they can mentally use the formula for slope since the points are given on the worksheet.
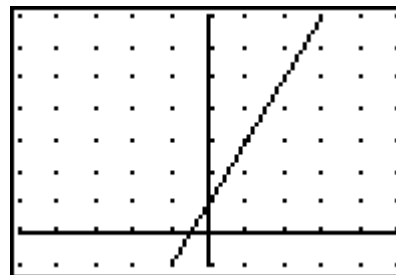
The second question asks students to identify the *y*-intercept of the line. They may need to be reminded that a *y*-intercept is on the vertical *y*-axis, and its ordered pair would be (0, *b*).

Students are to use both pieces of information to determine the slope-intercept form of the equation of the line.

Problem 4 – Assessing Understanding

Several questions are given on the student worksheet to assess the understanding of students on slope-intercept form.

If you are using TI-Navigator send the LearningCheck document ***MathManOnSlopes_LrnChk.edc*** as a self-check quiz to students. If you send the self-check file to students, have them complete the assessment and then see how they did.

You could also ask each question as a **Quick Poll** and quickly see student responses.