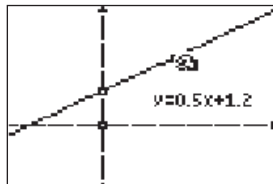# Investigating Equations of Lines

Approximate Total Time: 25 minutes

ACTIVITY OVERVIEW:
In this activity we will

- Draw a line and find its equation
- Move the points defining the line and observe the changes in the equation
- Draw another line and observe changes in its equation
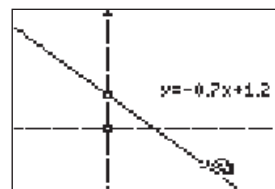

$y=0.5x+1.2$

We can explore the equations of lines written in the form: $y = mx + b$. By moving points defining the lines, we can view the related changes in the parameters of the equations.

NCTM Geometry Standard: Specify locations and describe spatial relationships using coordinate geometry and other representational systems.
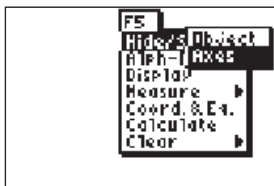
1

Press [APPS]. Move down to the CabriJr APP and press [ENTER]. Press [ENTER], or any key, to begin using the application.

Press [Y=] for the F1 menu and select **New**. (If asked to **Save changes?** press [◄] [ENTER] to choose "No.")

2

To show the axes, press [GRAPH] for the F5 menu, move to **Hide/Show**, and then move right and down to **Axes**. Press [ENTER].

3

Press [WINDOW] for F2, move to **Line** and press [ENTER]. Move until the y-axis is flashing and press [ENTER] at some location on the axis to mark the y-intercept of the line. Move to the right and up and press [ENTER]. This marks the second point that defines the line.

4

Press [GRAPH] for the F5 menu, move to **Coord. & Eq.** and press [ENTER]. Move until the line is flashing and press [ENTER]. The equation of the line is displayed and can be moved to a convenient location. Press [CLEAR] to deactivate the *hand*. Press [CLEAR] again to turn of the **Coord. & Eq.** tool.
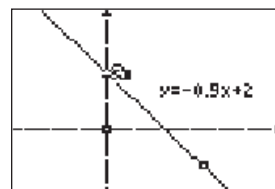
5

Move until the point (not on the y-axis) is flashing and press [ALPHA]. Move the point up and down and observe the changes in the equation of the line.

The slope of the line changes as the point moves. The y-intercept stays constant since it was one of the two points used to define the line.
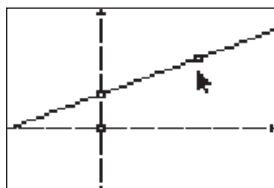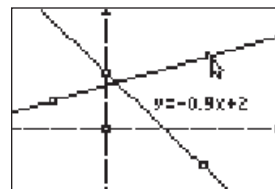
6

Press [CLEAR] and move until the y-intercept is flashing. Press [ALPHA] and move the point up and down on the axis. Observe that the y-intercept and the slope both change as the point is moved.
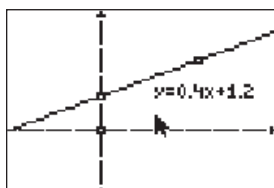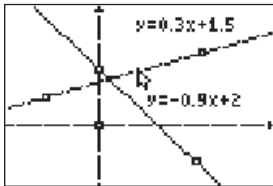
7

Draw another line using two more points, neither of which is the y-intercept of the new line. To do this press [WINDOW] for F2, move to **Line** and press [ENTER]. Move to a location in the second quadrant and press [ENTER]. Move to a location in the first quadrant and press [ENTER]. This marks the second point that defines the line.

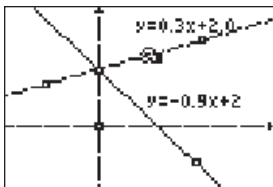Getting Started with Geometry • cabrijr.com

Act. 25.indd 48 3/6/06 5:19:14 PM

8

To find the equation of the new line, press GRAPH for the F5 menu, move to **Coord. & Eq.** and press ENTER. Move until the new line is flashing and press ENTER. The equation of the line is displayed and can be moved to a convenient location. Press CLEAR to deactivate the *hand*. Press CLEAR again to turn of the **Coord. & Eq.** tool.

9

Move until the new line is flashing and press ALPHA. Unlike the first line, this entire new line can be moved up or down keeping the same slope since the y-intercept was not one of the defining points.

You can also use the *hand* to move either of the points used to define the line. This will change the slope and the y-intercept.

For TI-Navigator™ Users

Activity Center: Have students submit equations with certain characteristics (e.g. with a specific slope, parallel to a given line, with the same y-intercept as a given line). For help, see page 69.

10

To exit the APP, press Y= for the F1 menu. Move to **Quit**, then press ENTER. (Or you can press 2nd MODE for [QUIT].)