

# Key Concepts



## Linear Relations and Functions

**Objective** Teach students to use a graphing calculator to graph linear relations and functions.

**Note to the Teacher** *This is an exploration lesson, both in using the graphing calculator and in introducing the relationship between the equation of a line and its graph. One possible source of confusion is that if the viewing window is not chosen correctly, a graph may not even appear in the window. Students must use the ZOOM feature in order to get a good view of the graph.*

Ask the class to graph various linear equations. Here are some examples.

**Examples** Graph each pair of linear equations.

1  $y = 3x + 7$  and  $y = 2 - 5x$

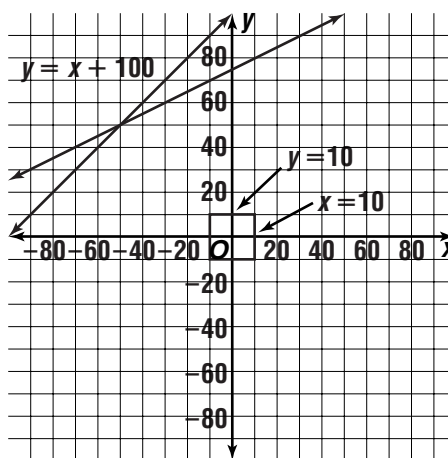
These equations are in slope-intercept form, so  $y$  is given explicitly in terms of  $x$ . This means that  $3x + 7$  and  $2 - 5x$  can be entered directly into the calculator.

2  $4x + 3y = 5$  and  $7x - 2y = 1$

In these equations, students must first solve for  $y$ , and then use the calculator. This reinforces their skills in solving equations.

3  $y = x + 100$  and  $2y - 150 = x$

In these equations, the constants are large numbers. So, if a student chooses to view the graphs in a window that includes only  $x$ - and  $y$ -coordinates between, say,  $-10$  and  $10$ , they will not see anything because there are no points on these graphs in that region of the plane. Be sure to explain this to students, perhaps by drawing the figure at the right.





The central viewing window does not include any part of the line.

Use this lesson to reinforce students' ability to solve equations and to translate a word problem into an algebraic expression. Example 3 in the Student Edition serves this second purpose well.

