5-9 Technology: Graph Linear Functions and Inequalities

Objective To use a handheld to graph linear functions and inequalities

Diego burns 7.5 calories per minute playing tennis. Write and graph a function representing the number of calories Diego burns after x minutes of playing tennis.

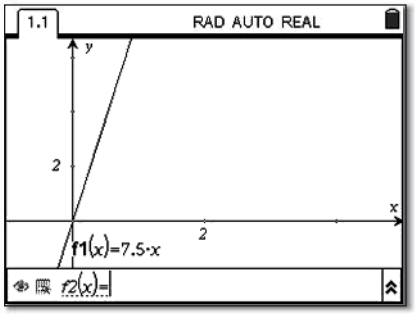
An equation in two variables can be written to represent the total calories burned playing tennis in x minutes.

$y = 7.5x$ ← Total calories burned = 7.5 *times* minutes playing.

► You can use a handheld to graph the linear function.

Step 1 Press [home]. Then choose 2 to select **Graphs & Geometry**.

Step 2 Use $f1(x)$ for y. Input $7.5x$. Then press [enter] to graph the equation.



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The graph of the function shown on the handheld represents the number of calories Diego can burn in x minutes. Note that *only* the first quadrant or the positive values of the linear function can correspond to time and calories burned.

► Sometimes before you can graph an equation using a handheld, you need to solve the equation for y.

Graph the equation: $-x = 2y - 3$ using a handheld.

Solve the equation for y.

$$-x = 2y - 3$$

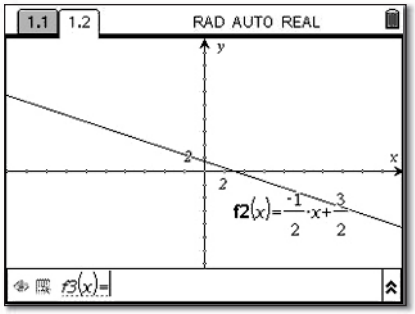
$-x + 3 = 2y - 3 + 3$ ← Use the Addition Property of Equality.

$$-x + 3 = 2y$$

$-\frac{1}{2}x + \frac{3}{2} = y$ ← Use the Division Property of Equality.

Step 1 Press [home]. Then choose 2 to select **Graphs & Geometry**.

Step 2 Use $f2(x)$ for y. Input $-\frac{1}{2}x + \frac{3}{2}$. Then press [enter] to graph the equation.



* Window setting adjusted to fit graph

▶ You can also use a handheld to graph linear inequalities.

Graph the inequality $-4y + 7 < 9$ using a handheld.

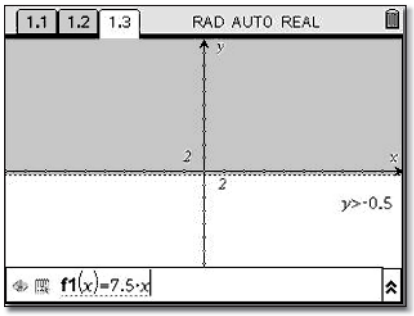
Remember: Reverse the inequality symbol when multiplying or dividing by a negative number.

Solve the inequality for y.

$$-4y + 7 < 9$$
$$-4y + 7 - 7 < 9 - 7 \quad \leftarrow \text{Use the Subtraction Property of Inequality.}$$
$$-4y < 2$$
$$\frac{-4y}{-4} > \frac{2}{-4} \quad \leftarrow \text{Use the Division Property of Inequality.}$$
$$y > -0.5$$

Step 1 Press [home]. Then choose [2] to select **Graphs & Geometry**.

Step 2 Use [clear] to delete the equal sign. Then input [>] -0.5. Press [≈ enter] to graph the inequality. Since an inequality is not a function, $f3(x)$ changes to y.



Example

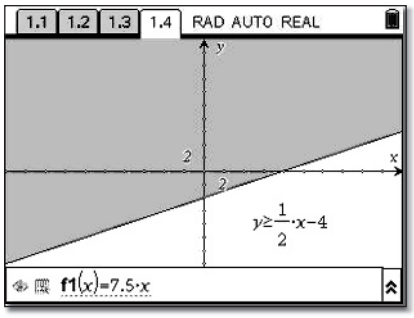
1 Graph the inequality $2y + 6 \geq x - 2$ using a handheld.

Solve the inequality for y.

$$2y + 6 \geq x - 2$$
$$2y + 6 - 6 \geq x - 2 - 6 \quad \leftarrow \text{Use the Subtraction Property of Inequality.}$$
$$2y \geq x - 8 \quad \leftarrow \text{Simplify.}$$
$$\frac{2y}{2} \geq \frac{x - 8}{2} \quad \leftarrow \text{Use the Division Property of Inequality.}$$
$$y \geq \frac{1}{2}x - 4 \quad \leftarrow \text{Simplify.}$$

Step 1 Press [home]. Then choose [2] to select **Graphs & Geometry**.

Step 2 Use [clear] to delete the equal sign. Input $\geq \frac{1}{2}x - 4$. Press [ctrl] [>] for the $\geq$ symbol. Then press [≈ enter] to graph the inequality.



Try These

Use a handheld to graph the linear function or inequality.

1. $y = 2x + 3$

2. $y + 6 = -x - 4$

3. $-3y - 4 = 9x + 7$

4. $y \leq 3x - 9$

5. $y + 6 \geq x - 2$

6. $-4y + 10 > 2x - 3$

7. Discuss and Write How would the graph $y > 5x - 6$ change if the inequality symbol was $\geq$? or $<$? or $\leq$? Use a handheld to check your answers.

Go to PRACTICE BOOK Lesson 5-9 for exercise sets.