

Technology: Solve Linear Inequalities

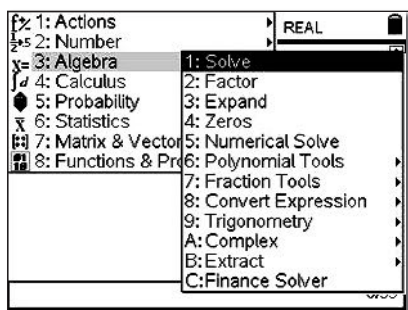
Objective To use a handheld to solve linear inequalities

- Some handhelds allow you to solve linear inequalities. You can use the **Solve** command on a handheld to determine the solution set.

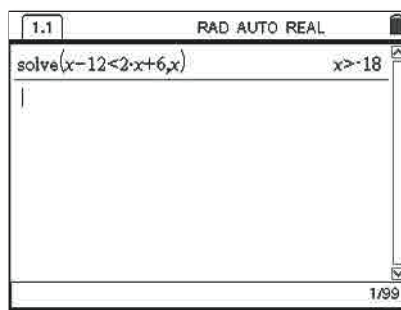
Solve the inequality $x - 12 < 2x + 6$ using a handheld.

Step 1 Press . Then choose to select **Calculator**.

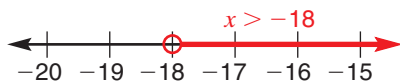
Step 2 Press . Select **Algebra**, then choose **Solve**.



Step 3 Input $x - 12 < 2x + 6$ and then x . Press . The x parameter means to solve the inequality for x .



To verify that the solution set satisfies the inequality without using a handheld, graph the solution set and choose test points.



Try $x = -20$. $x - 12 < 2x + 6$
 $-20 - 12 \stackrel{?}{<} 2(-20) + 6$
 $-32 < -34$ **False**

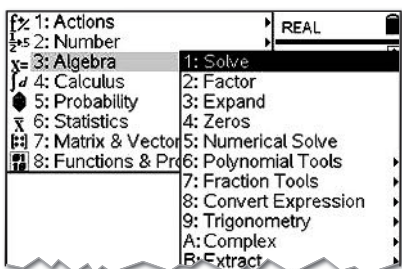
Try $x = -15$. $x - 12 < 2x + 6$
 $-15 - 12 \stackrel{?}{<} 2(-15) + 6$
 $-27 < -24$ **True**

Represent the solution set from the handheld in set-builder and interval notation.

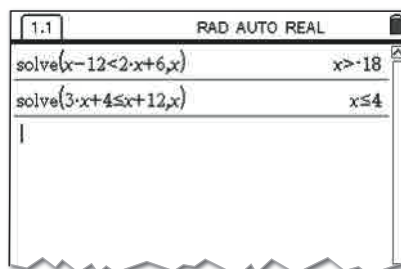
Solution set: $\{x | x > -18\}$, or $(-18, \infty)$.

- Solve the inequality $3x + 4 \leq x + 12$ using a handheld. Verify the solution, then represent the solution set in set-builder and interval notation.

Step 1 Press . Select **Algebra**, then choose **Solve**.

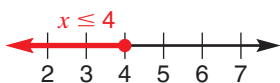


Step 2 Input $3x + 4 \leq x + 12, x$. Then press . Use for the inequality symbol $\leq$.



The solution set is $x \leq 4$.

Verify the solution set without using a handheld.



Try $x = 5$. $3x + 4 \leq x + 12$

$$3(5) + 4 \stackrel{?}{\leq} 5 + 12$$

$$19 \leq 17 \text{ False}$$

Try $x = 2$. $3x + 4 \leq x + 12$

$$3(2) + 4 \stackrel{?}{\leq} 2 + 12$$

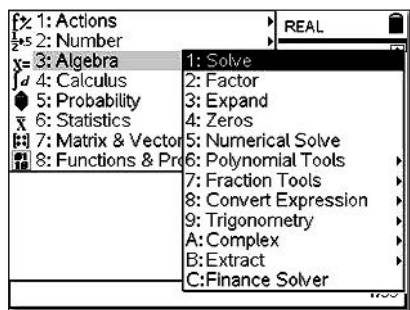
$$10 \leq 14 \text{ True}$$

Solution set: $\{x|x \leq 4\}$, or $(-\infty, 4]$

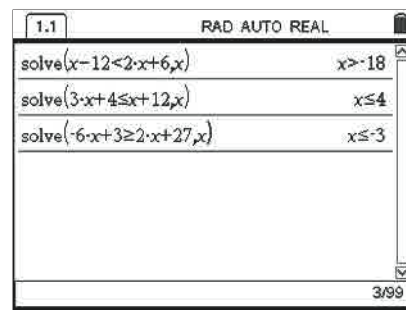
Example

- 1** Solve the inequality $-6x + 3 \geq 2x + 27$ using a handheld. Verify the solution, then represent the solution set in set-builder and interval notation.

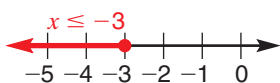
Step 1 Press . Select **Algebra**, then choose **Solve**.



Step 2 Input $-6x + 3 \geq 2x + 27, x$. Then press . Use for the inequality symbol $\geq$.



Verify the solution set without using the handheld.



Try $x = 0$. $-6x + 3 \geq 2x + 27$

$$-6(0) + 3 \stackrel{?}{\geq} 2(0) + 27$$

$$3 \geq 27 \text{ False}$$

Try $x = -5$. $-6x + 3 \geq 2x + 27$

$$-6(-5) + 3 \stackrel{?}{\geq} 2(-5) + 27$$

$$33 \geq 17 \text{ True}$$

Solution set: $\{x|x \leq -3\}$, or $(-\infty, -3]$.

Try These

Use a handheld to solve each inequality. Verify the solution set, then represent your answer in set-builder and interval notation.

1. $7x + 15 > 2x$

2. $5x - 2 \leq 3x + 2$

3. $x - 3 < 15 - 2x$

4. $2x + 7 > 4x + 11$

5. $6 - x > 6x - 1$

6. $3x + 4 \leq 5x + 12$

7. **Discuss and Write** Write two inequalities that have the same solution. Verify your answer using a handheld.