6.4 Solve Compound Inequalities ◤ TEKS *a.5, A.7.B*

QUESTION How can you use a graphing calculator to display the solutions of a compound inequality?

EXAMPLE Display the solutions of a compound inequality on a graphing calculator

Display the solutions of $12 \le 3x \le 21$ on a graphing calculator.

STEP 1 *Rewrite inequality*

Rewrite $12 \le 3x \le 21$ as two separate inequalities joined by *and*.

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$12 \le 3x \le 21$	**Write original inequality.**
$12 \le 3x$ *and* $3x \le 21$	**Write as two inequalities joined by *and*.**

STEP 2 *Enter inequalities*

Press Y= and enter the two inequalities, as shown. Inequality signs can be found in the TEST menu, and *and* and *or* can be found in the LOGIC menu.

STEP 3 *Display solutions*

Press GRAPH to display the solutions of $12 \le 3x$ *and* $3x \le 21$. For each value of x that makes the inequality true, the calculator assigns a value of 1 to y and plots the point $(x, 1)$. For each value of x that makes the inequality false, the calculator assigns a value of 0 to y and plots the point $(x, 0)$.

```
Y1■12≤3X and 3X≤
21
Y2=
Y3=
Y4=
Y5=
Y6=
```
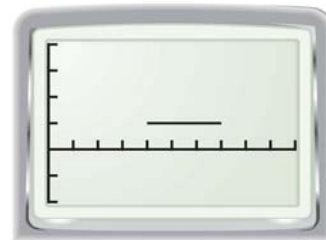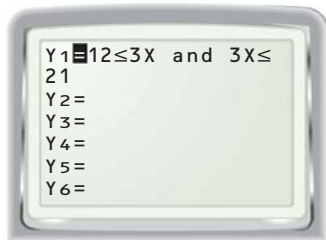
The screen in Step 3 shows the graph of $y = 1$ over the interval $4 \le x \le 7$. This suggests that the solutions are all real numbers greater than or equal to 4 *and* less than or equal to 7.

DRAW CONCLUSIONS

1. Display the solutions of $12 < 3x < 21$ on a graphing calculator. Then compare the graph of $12 < 3x < 21$ with the graph of $12 \le 3x \le 21$.

2. When displaying the solutions of an inequality on a graphing calculator, how do you know which inequality symbols you should use in your solution?

Display the solutions of the inequality on a graphing calculator.

3. $9 \le 3x \le 21$
4. $4 < 4x < 8$
5. $2 \le \frac{1}{4}x \le 12$

6. $-6x > 18$ *or* $-9x < 45$
7. $4x \le 18$ *or* $5x \ge 25$
8. $8x \le 16$ *or* $3x \ge 30$