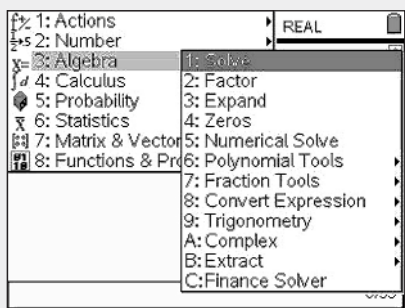# 3-7 Technology: Solve Linear Inequalities

Name _____ Date _____
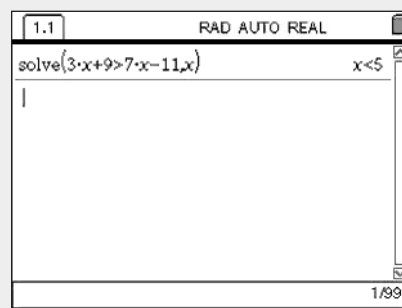
You can use the **Solve** function on a handheld to solve the inequality $3x + 9 > 7x - 11$.

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

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

Step 3 Input $3x + 9 > 7x - 11, x$. Then press enter.

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║ 1: Actions            ▶    ║ REAL      ║
║ 2: Number             ▶    ║           ║
║ 3: Algebra          1: Solve           ║
║ 4: Calculus         2: Factor          ║
║ 5: Probability      3: Expand          ║
║ 6: Statistics       4: Zeros           ║
║ 7: Matrix & Vector  5: Numerical Solve ║
║ 8: Functions & Pro  6: Polynomial Tools ▶ ║
║                     7: Fraction Tools  ▶║
║                     8: Convert Expression ▶║
║                     9: Trigonometry    ▶║
║                     A: Complex         ▶║
║                     B: Extract         ▶║
║                     C: Finance Solver   ║
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║ 1.1              RAD AUTO REAL         ║
║ solve(3·x+9>7·x−11,x)          x<5     ║
║ |                                      ║
║                                 1/99   ║
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Remember: ",x" means solve the inequality for x.

So the solution is $\{x \mid x < 5\}$ or $(-\infty, 5)$.

To verify that the solution determined satisfies the inequality, graph the solution set and choose test points.

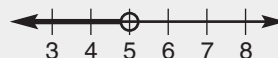$x = 4: 3(4) + 9 \overset{?}{>} 7(4) - 11$

$\qquad\qquad 21 \overset{?}{>} 17$ True

$x = 5: 3(5) + 9 \overset{?}{>} 7(5) - 11$

$\qquad\qquad 24 \overset{?}{>} 24$ False

$x = 6: 3(6) + 9 \overset{?}{>} 7(6) - 11$

$\qquad\qquad 27 \overset{?}{>} 31$ False

number line: 3 4 5 6 7 8, open circle at 5

Use a handheld to find the solution of the inequality. Represent your answer in set builder and interval notation.

1. $9x > 7x - 12$

$\{x \mid x > -6\}; (-6, \infty)$

2. $8x > 2x - 24$

3. $11x - 9 \le 3x - 49$

4. $12x - 2 \le 2x - 62$

5. $3x + 1 \ge 7x + 17$

6. $2x + 3 \ge 9x + 24$

7. $11x - 8 < 5x + 34$

8. $13x - 9 < 2x + 90$

9. $3x - 8 > 56 - 5x$

10. $4x - 11 > 43 - 2x$

11. $3x - 15 \ge 75 - 6x$

12. $7x - 8 \ge 100 - 5x$

Use a handheld to find the solution of the inequality. Represent your answer in set builder and interval notation.

13. $14x - 13 \le 8.3 + 8x$

$\{x \mid x \le 16\}; (-\infty, 16]$

14. $17x - 11 \le 79 + 15x$

_____

15. $3x + 10 \ge 5x + 22$

_____

16. $1.8x - 3.5 \ge 5.86$

_____

17. $3.9x - 4.7 \ge 21.82$

_____

18. $4.8x + 2.9 < 2.3x + 19.9$

_____

19. $5.3x + 1.6 < 3.7x + 16.64$

_____

20. $1.3x - 4.5 < 4.4x + 7.59$

_____

21. $5.7x - 2.8 < 7.9x + 8.42$

_____

22. $\frac{2}{3}x + \frac{1}{5} \le \frac{3}{4}$

_____

23. $\frac{5}{8}x + \frac{1}{3} \le \frac{1}{6}$

_____

24. $\frac{2}{5}x + \frac{1}{2} \ge \frac{5}{4}x + \frac{4}{5}$

_____

25. $\frac{5}{3}x + \frac{1}{4} \ge \frac{7}{2}x + \frac{3}{8}$

_____

26. $\frac{9}{2}x + \frac{7}{10} > 2.4x - |-3.08|$

_____

27. $\frac{11}{2}x + \frac{9}{10} > 3.2x - |-4.16|$

_____

Problem Solving

28. Clayton gave Mia clues to help her guess the number he chose. Clue #1: Eight less than 7 times the number is at least 22. Clue #2: Thirteen more than 5 times the number is at most 52. Clue #3: The number is an integer. Write the inequalities, solve them on a handheld, and give the possible solutions.

_____

29. A farmer removes the fence around a 122,500-square-foot square field and uses it to enclose a rectangular field that is 2 feet longer than twice its width. What are the possible integer widths of the rectangular field?

_____

CHALLENGE

30. Solve $|3x - 5| < 2$ using a handheld.

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