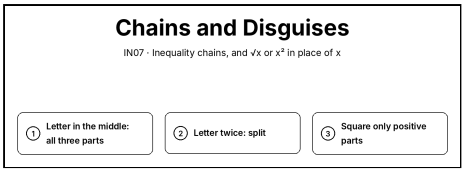
Chains and Disguises: teacher script

IN07-V1 · IN07 Inequality chains, and √x or x² in place of x · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 93 seconds as a video.

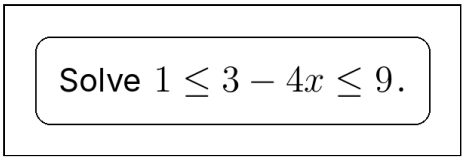
01



Say. Chains. If the letter is only in the middle, do each step to all three parts. If the letter is in more than one part, split the chain. Square a chain only when every part is positive.

Draw. Write the title “Chains and Disguises” and the steps: 1. Letter in the middle: all three parts; 2. Letter twice: split; 3. Square only positive parts.

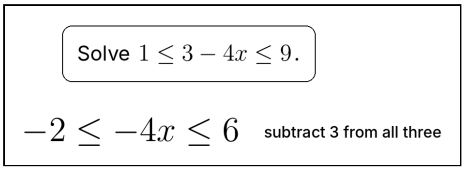
02



Say. Solve 1 is less than or equal to 3 minus 4 x, which is less than or equal to 9.

Draw. Clear the board. Write “Solve 1 \le 3 − 4x \le 9.” in a box at the top.

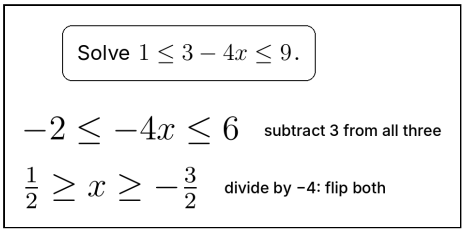
03



Say. Subtract 3 from all three parts: negative 2 is at most negative 4 x, which is at most 6.

Draw. Write −2 \le −4x \le 6 on the next line. Beside it, write “subtract 3 from all three”.

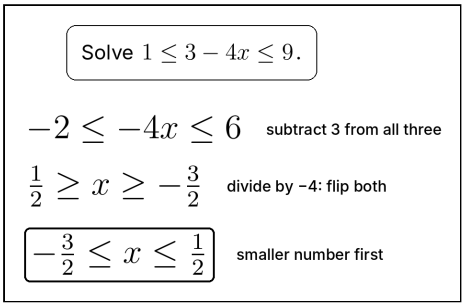
04



Say. Divide all three by negative 4, and flip both signs: one half is at least x, which is at least negative 3 halves.

Draw. Write 1/2 \ge x \ge −3/2 on the next line. Beside it, write “divide by −4: flip both”.

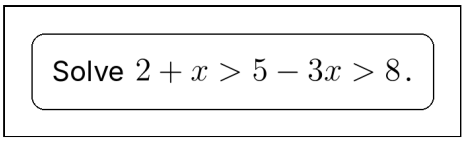
05



Say. Write it with the smaller number first: negative 3 halves is at most x, which is at most one half.

Draw. Write −3/2 \le x \le 1/2 and box it on the next line. Beside it, write “smaller number first”.

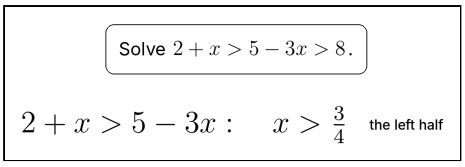
06



Say. Solve 2 plus x is greater than 5 minus 3 x, which is greater than 8.

Draw. Clear the board. Write “Solve 2 + x > 5 − 3x > 8.” in a box at the top.

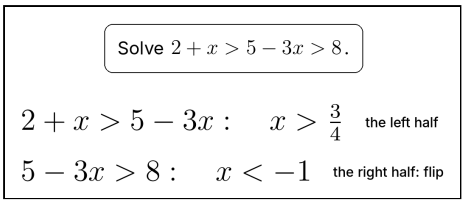
07



Say. x is in two parts, so split it. The left half: 4 x is greater than 3, so x is greater than 3 quarters.

Draw. Write 2 + x > 5 − 3x: x > 3/4 on the next line. Beside it, write “the left half”.

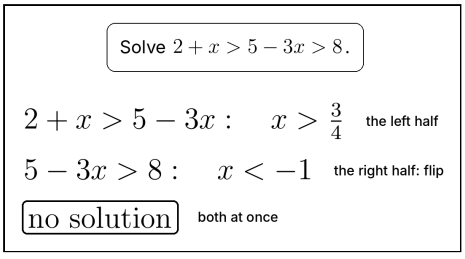
08



Say. The right half: negative 3 x is greater than 3, so x is less than negative 1.

Draw. Write 5 − 3x > 8: x < −1 on the next line. Beside it, write “the right half: flip”.

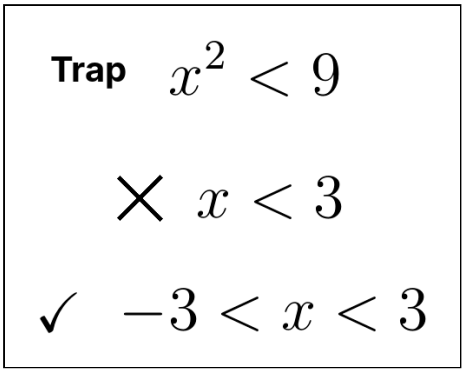
09



Say. No number is both more than 3 quarters and less than negative 1. There is no solution.

Draw. Write no solution and box it on the next line. Beside it, write “both at once”.

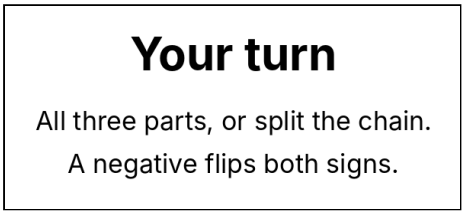
10



Say. Watch for the trap: x squared less than 9 is not just x less than 3. Negative numbers have squares too: negative 4 squared is 16. The answer is x between negative 3 and 3.

Draw. Clear the board. Write “Trap” and $x^2 < 9$. Below, write x < 3 and cross it out ×. Then write −3 < x < 3 with a tick ✓.

11



Say. Now it is your turn. Do each step to all three parts, or split the chain. And dividing by a negative number flips both signs.

Draw. Point to today’s activity: All three parts, or split the chain. A negative flips both signs.