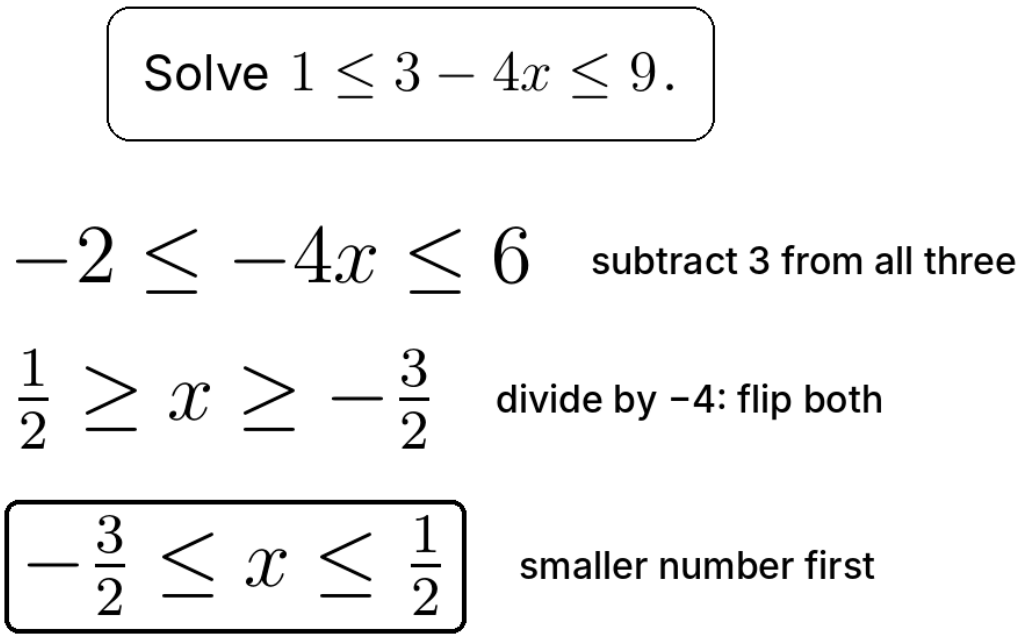
Chains and Disguises

IN07-V1 · storyboard · IN07 Inequality chains, and √x or x² in place of x. Read each picture with its sentences.

Picture 1



1. Solve 1 is less than or equal to 3 minus 4 x, which is less than or equal to 9.
2. Subtract 3 from all three parts: negative 2 is at most negative 4 x, which is at most 6.
3. Divide all three by negative 4, and flip both signs: one half is at least x, which is at least negative 3 halves.
4. Write it with the smaller number first: negative 3 halves is at most x, which is at most one half.

Picture 2

Solve $2 + x > 5 - 3x > 8$.

$2 + x > 5 - 3x$: $x > \frac{3}{4}$ the left half

$5 - 3x > 8$: $x < -1$ the right half: flip

$\boxed{\text{no solution}}$ both at once

5. Solve 2 plus x is greater than 5 minus 3 x, which is greater than 8.
6. x is in two parts, so split it.
7. The left half: 4 x is greater than 3, so x is greater than 3 quarters.
8. The right half: negative 3 x is greater than 3, so x is less than negative 1.
9. No number is both more than 3 quarters and less than negative 1.
10. There is no solution.

Picture 3

Trap $x^2 < 9$

$\times$ $x < 3$

$\checkmark$ $-3 < x < 3$

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