WHY THE ANSWER SPLITS

Solving $ax + b > c$ for x: subtracting b gives $ax > c - b$. To divide by a, its sign matters, and in a literal inequality that sign may not be known.

LITERAL INEQUALITY

$$ax > c - b$$

split by **the sign of a**

+

CASE 1

$a > 0$

Direction preserved

$$x > \frac{c-b}{a}$$

−

CASE 2

$a < 0$

Direction reverses

$$x < \frac{c-b}{a}$$

TAKEAWAY

Both cases must be stated, because without knowing a neither can be discarded. Omitting one produces an answer that is wrong half the time.