⚖️ Linear inequalities & interval notation

Date _____ Topic 1/3

CUES · QUESTIONS

1. When does the inequality sign flip?
2. Interval notation for $x > -2$?
3. Set notation for $x \leq 5$?
4. Open dot vs closed dot?

Cover the notes. Answer each cue from memory.

NOTES

1 · Worked example Copy one example from the page. Next to each line write WHY in a few words.

2 · Fill in the blanks Cover the steps and redo it. Leave a gap where you are unsure.

3 · Your turn A new question. Then check it against the answer.

SUMMARY — IN MY OWN WORDS, TWO SENTENCES

⚖️ Quadratic inequalities (sign analysis)

Date _____ Topic 2/3

CUES · QUESTIONS

1. Opens up, want < 0. Where?
2. Opens up, want > 0. Where?
3. Solve $x^2 + 4 > 0$.
4. First move for $x^2 \geq 5x$?

Cover the notes. Answer each cue from memory.

NOTES

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SUMMARY — IN MY OWN WORDS, TWO SENTENCES

⚖ Domain & range limits in context

Date _____ Topic 3/3

CUES · QUESTIONS

1. Domain of a projectile $h(t)$ launched at $t = 0$?
2. Range of a projectile launched from the ground?
3. Domain for "number of tickets sold"?
4. "At least" means which symbol?

Cover the notes. Answer each cue from memory.

NOTES

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3 · Your turn A new question. Then check it against the answer.

SUMMARY — IN MY OWN WORDS, TWO SENTENCES

⚖️ Linear & Quadratic Inequalities • Formula and trap sheet

Everything you need before a test, on the fewest pages. Fold it and keep it in your binder.

Linear inequalities & interval notation

FORMULAS

$a < b$ and $k < 0 \Rightarrow ka > kb$ — Multiplying by a negative flips the sign

$x \leq 4 \Leftrightarrow (-\infty, 4]$ — Inequality ↔ interval notation

REMEMBER

- Solve like an equation; multiply or divide by a NEGATIVE → flip the sign.
- $\leq, \geq$: closed dot, square bracket. $<, >$: open dot, round bracket. ∞ always round.

WATCH OUT

- $-4x \geq 12 \Rightarrow x \geq -3 \rightarrow x \leq -3$.
- $x < 5$ as $(-\infty, 5] \rightarrow (-\infty, 5)$.

Quadratic inequalities (sign analysis)

FORMULAS

$a(x-r)(x-s) < 0,\ a > 0,\ r < s \Rightarrow r < x < s$ — Opens up: negative between the zeros

$a(x-r)(x-s) > 0,\ a > 0 \Rightarrow x < r$ or $x > s$ — Opens up: positive outside the zeros

REMEMBER

- Everything to one side, find the zeros, then decide the sign between and outside them.
- Opens up: negative BETWEEN the zeros, positive OUTSIDE.

WATCH OUT

- $x^2 > 16 \Rightarrow x > \pm 4 \rightarrow x < -4$ or $x > 4$.
- $-x^2 + x + 6 \geq 0$ read as opening up → opens down: $-2 \leq x \leq 3$.

Domain & range limits in context

FORMULAS

$h(t) \geq 0$ and $t \geq 0$ — Typical projectile restrictions

REMEMBER

- Domain in context: time from 0 to landing, lengths > 0, counts are whole numbers.
- Range in context: the vertex value (if inside the domain) and the endpoint values.

WATCH OUT

- Domain of a ball model "all real numbers" → $0 \leq t \leq t_{\text{land}}$.
- Range from the endpoints only → include the vertex (the top of an arch).