Unit 5 · Inequalities Cheat Sheet

Unit 5 focus: inequality symbols, solutions and graphs

1 KEY VOCABULARY

inequality	Compares two values with <, >, ≤, ≥.	$x > 4$
solution	A value that makes it true.	6 is a solution of $x > 4$
solution set	All values that make it true.	every number greater than 4
open circle	Endpoint not included (< or >).	$x < 2$
closed circle	Endpoint included (≤ or ≥).	$x \geq -1$

2 SYMBOLS IN WORDS

Words	Symbol
at least, no less than	≥
at most, no more than	≤
more than, exceeds	>
fewer than, below	<

3 TESTING SOLUTIONS

Substitute; if the statement is true, the value is a solution.

Example: Is 7 a solution of $3x - 5 \geq 16$?
Substitute: $3(7) - 5 = 16$
Check: $16 \geq 16$ is true

Answer: Yes

4 GRAPHING ON A NUMBER LINE

$x > 3$	**open circle at 3, arrow right**
$x \leq -2$	**closed circle at −2, arrow left**
$y \geq 0$	**closed circle at 0, arrow right**
$n < 5$	**open circle at 5, arrow left**

5 WRITING INEQUALITIES FROM GRAPHS

Closed circle at 4, arrow left	**$x \leq 4$**
Open circle at −1, arrow right	**$x > -1$**
Open circle at 0, arrow left	**$x < 0$**

6 QUICK REMINDERS & COMMON MISTAKES

✓ Do remember

- The arrow points the way the solutions go.
- Many values can be solutions.
- Check one value from your graph.

✗ Common mistakes

- Closed circle for <: use an open circle
- “At least 10” as $x < 10$: $x \geq 10$
- Only listing one solution: describe all of them

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More practice: solving one-step inequalities and applications

1 SOLVING BY ADDING OR SUBTRACTING

Undo with the inverse operation on both sides.

Example: $x + 8 < 15$
Subtract 8: $x < 7$
Answer: $x < 7$

2 SOLVING BY MULTIPLYING OR DIVIDING

Divide or multiply both sides by a positive number.

Example: $4n \geq 36$
Divide by 4: $n \geq 9$
Answer: $n \geq 9$

3 FRACTIONS IN INEQUALITIES

Multiply both sides by the denominator.

Example: $\frac{y}{3} \leq 5$
Multiply by 3: $y \leq 15$
Answer: $y \leq 15$

4 APPLICATIONS

Write the inequality from the words, then solve.

Example: You have $40 and tickets cost $6 each. How many can you buy?
Inequality: $6t \leq 40$
Divide: $t \leq 6.\overline{6}$
Answer: at most 6 tickets

5 WHOLE-NUMBER ANSWERS

Context	Round
Tickets, people, buses	Whole numbers only
“At most” money left	Round down
“At least” buses needed	Round up

Always reread the question to decide.

6 CHECK YOURSELF

- Did I pick the right symbol for the words?
- Open or closed circle?
- Does a number from my graph make the inequality true?
- Does my answer make sense in the story?