Unit 2 · Solving One-Step Equations and Inequalities Cheat Sheet

Unit 2 focus: number properties, the distributive property and simplifying

1 PROPERTIES OF NUMBERS

Property	Example
Commutative	$a + b = b + a$
Associative	$(a + b) + c = a + (b + c)$
Identity	$a + 0 = a$, $a \cdot 1 = a$
Zero property	$a \cdot 0 = 0$

2 THE DISTRIBUTIVE PROPERTY

Multiply the outside number by EACH term inside.

Example: $-3(2x - 5)$
Distribute: $-3 \cdot 2x$ and $-3 \cdot (-5)$

Answer: $-6x + 15$

3 SIMPLIFYING EXPRESSIONS

Combine like terms: same variable, same exponent.

Example: $5x + 8 - 2x + 3$
Group: $(5x - 2x) + (8 + 3)$

Answer: $3x + 11$

4 KEY VOCABULARY

like terms	Same variable part.	$4y$ and $-y$
inverse operations	Undo each other.	+ and −, × and ÷
solution	Makes the equation true.	$x = 4$ for $x + 3 = 7$
inequality	Compares with $<$, $>$, $\leq$, $\geq$.	$n \geq 2$

5 GUESS, CHECK, AND REVISE

Make a guess, test it, and adjust up or down.

Example: Two numbers add to 30 and one is 6 more than the other.
Try 10 and 20: difference 10, too big
Try 12 and 18: difference 6 ✓

Answer: 12 and 18

6 QUICK REMINDERS & COMMON MISTAKES

✓ Do remember

- Distribute to every term in the parentheses.
- Only combine like terms.
- Keep the sign in front of each term.

✗ Common mistakes

- $-3(2x - 5) = -6x - 15$: +15 (negative × negative)
- $5x + 3 = 8x$: not like terms
- Dropping a negative sign: circle each sign first

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More practice: one-step equations and inequalities and their graphs

1 ADDING OR SUBTRACTING TO SOLVE

Use the inverse operation on both sides.

Example: $x - 14 = -6$
Add 14: $x = -6 + 14$
Answer: x = 8

2 MULTIPLYING OR DIVIDING TO SOLVE

Divide (or multiply) both sides.

Example: $\frac{y}{-4} = 7$
Multiply by −4: $y = 7(-4)$
Answer: y = −28

3 GRAPHING INEQUALITIES

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

4 INEQUALITIES BY ADDING OR SUBTRACTING

Solve like an equation; the sign does not change.

Example: $n + 9 \leq 4$
Subtract 9: $n \leq -5$
Answer: n ≤ −5

5 INEQUALITIES BY MULTIPLYING OR DIVIDING

Dividing or multiplying by a NEGATIVE flips the inequality sign.

Example: $-3x < 12$
Divide by −3 and flip: $x > -4$
Answer: x > −4

6 CHECK YOURSELF

- Did I follow the order of operations?
- Did I do the same thing to both sides?
- Did I check my answer in the original problem?
- Does my answer have the right sign and units?