Unit 7 · Solving Equations and Inequalities Cheat Sheet

Unit 7 focus: two-step and multi-step equations, fractions and decimals

1 TWO-STEP EQUATIONS

Undo addition or subtraction first, then multiplication or division.

Example: $5x - 7 = 18$
Add 7: $5x = 25$
Divide by 5: $x = 5$

Answer: x = 5

2 MULTI-STEP EQUATIONS

Distribute, combine like terms, then solve.

Example: $3(x + 4) - x = 20$
Distribute: $3x + 12 - x = 20$
Combine: $2x + 12 = 20$

Answer: x = 4

3 EQUATIONS WITH FRACTIONS

Multiply every term by the LCD to clear fractions.

Example: $\frac{x}{3} + \frac{1}{2} = \frac{7}{6}$
Multiply by 6: $2x + 3 = 7$

Answer: x = 2

4 EQUATIONS WITH DECIMALS

Multiply by 10 or 100 to clear decimals, or solve directly.

Example: $0.4x + 1.2 = 3.6$
Subtract 1.2: $0.4x = 2.4$

Answer: x = 6

5 WRITE AN EQUATION

Define a variable, translate the words, solve.

Example: A gym charges $25 to join and $15 a month. Total $160. How many months?
Equation: $25 + 15m = 160$

Answer: 9 months

6 QUICK REMINDERS & COMMON MISTAKES

✓ Do remember

- Undo operations in reverse order.
- Distribute to every term.
- Multiply EVERY term by the LCD.

✗ Common mistakes

- $5x - 7 = 18 \rightarrow 5x = 11$: add 7: 25
- $3(x + 4) = 3x + 4$: $3x + 12$
- Clearing only one fraction: multiply every term

Unit 7 · Solving Equations and Inequalities Cheat Sheet

More practice: variables on both sides, two-step inequalities, formulas and interest

1 VARIABLES ON BOTH SIDES

Collect variable terms on one side first.

Example: $7x + 3 = 2x + 28$
Subtract 2x: $5x + 3 = 28$
Solve: $5x = 25$

Answer: x = 5

2 TWO-STEP INEQUALITIES

Solve like an equation; flip the sign if you multiply or divide by a negative.

Example: $-2x + 5 > 13$
Subtract 5: $-2x > 8$
Divide by −2, flip: $x < -4$

Answer: x < −4

3 TRANSFORMING FORMULAS

Solve for the requested variable using inverse operations.

Example: Solve $P = 2l + 2w$ for w.
Subtract 2l: $P - 2l = 2w$

Answer: $w = \frac{P-2l}{2}$

4 SIMPLE INTEREST

$I = Prt$ (r as a decimal, t in years).

Example: \$800 at 4% for 3 years
Multiply: $800 \times 0.04 \times 3$

Answer: \$96

5 COMPOUND INTEREST

$B = P(1 + r)^t$ when interest is added yearly.

Example: \$1,000 at 5% for 2 years
Compute: $1000(1.05)^2$

Answer: \$1,102.50

6 CHECK YOURSELF

- Did I check by substituting my solution?
- Did I flip the sign for a negative divisor?
- Did I convert the percent to a decimal?
- Did I collect variables on one side first?