Adding and Subtracting Linear Expressions

Apply the skill to decisions and designs

Name _____ **Date** _____ **Score** _____ / 10

QUICK REVIEW

Add or subtract matching variable coefficients and constants. A minus before parentheses changes every sign inside:
$(5x + 2) - (2x - 3) = 5x + 2 - 2x + 3 = 3x + 5$.

Worked example

Example: simplify $(7x + 9) + (4x - 3)$.

1. Remove the second parentheses with sign 1: $7x + 9 + (4)x + (-3)$.
2. Variable coefficient: $7 + (4) = 11$.
3. Constant: $9 + (-3) = 6$; result $11x + 6$.
Answer: $11x + 6$.

Practice Problems

Show your thinking.

1. Material order: a cost in dollars is modeled by $(2x + 3) + (3x + 5)$. Rewrite it to expose its coefficient and fixed amount, then find the cost at $x = 2$.

2. Two design formulas: decide whether $(3x - 2) - (2x + 5)$ and $x - 7$ are equivalent for every x. Give algebra and a numerical check.

3. Packing total: rewrite $(4x + 5) + (-x + 3)$, then evaluate the rewritten expression at $x = 2$.

4. Cost components: an equivalent form of $(5x + 2) - (3x - 2)$ has coefficient q on x and constant r. Find (q, r) and then write the resulting expression.

5. Invoice check: a calculator reports 24 for $(2x + 7) + (5x + 3)$ when $x = 2$. Verify by rewriting first; report any error.

6. Unknown adjustment: $(3x + 4) - (4x - 1) = -x + k$. Find k, then write the simplified expression.

7. Locker-code rule: a cost in dollars is modeled by $(7x - 5) + (-3x + 9)$. Rewrite it to expose its coefficient and fixed amount, then find the cost at $x = 2$.

8. Token-count rule: decide whether $(-4x + 6) - (9x - 2)$ and $-13x + 8$ are equivalent for every x. Give algebra and a numerical check.

9. Tile-pack rule: rewrite $(5x - 8) + (-2x + 3)$, then evaluate the rewritten expression at $x = 2$.

10. Meter-offset rule: an equivalent form of $(8x + 1) - (-5x - 7)$ has coefficient q on x and constant r. Find (q, r) and then write the resulting expression.

Answer Key

1. $5x + 8$; cost \$18.00.
2. Yes; they are equivalent.
3. $3x + 8$; value 14.
4. $(q, r) = (2, 4)$; $2x + 4$.
5. No error; $7x + 10$ evaluates to 24.
6. $k = 5$; $-x + 5$.
7. $4x + 4$; cost \$12.00.
8. Yes; they are equivalent.
9. $3x - 5$; value 1.
10. $(q, r) = (13, 8)$; $13x + 8$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Remove the second parentheses with sign 1: $2x + 3 + (3)x + (5)$.
2. Variable coefficient: $2 + (3) = 5$.
3. Constant: $3 + (5) = 8$; result $5x + 8$.
4. The cost at $x = 2$ is $5(2) + (8) = 18$ dollars.

Problem 2

1. Remove the second parentheses with sign -1: $3x - 2 + (-2)x + (-5)$.
2. Variable coefficient: $3 + (-2) = 1$.
3. Constant: $-2 + (-5) = -7$; result $x - 7$.
4. Numerical check at $x = 2$: both equal $1(2) + (-7) = -5$.

Problem 3

1. Remove the second parentheses with sign 1: $4x + 5 + (-1)x + (3)$.
2. Variable coefficient: $4 + (-1) = 3$.
3. Constant: $5 + (3) = 8$; result $3x + 8$.
4. At $x = 2$: $3(2) + (8) = 14$.

Problem 4

1. Remove the second parentheses with sign -1: $5x + 2 + (-3)x + (2)$.
2. Variable coefficient: $5 + (-3) = 2$.
3. Constant: $2 + (2) = 4$; result $2x + 4$.

Problem 5

1. Remove the second parentheses with sign 1: $2x + 7 + (5)x + (3)$.
2. Variable coefficient: $2 + (5) = 7$.
3. Constant: $7 + (3) = 10$; result $7x + 10$.
4. Check: $7(2) + (10) = 24$.

Problem 6

1. Remove the second parentheses with sign -1: $3x + 4 + (-4)x + (1)$.
2. Variable coefficient: $3 + (-4) = -1$.
3. Constant: $4 + (1) = 5$; result $-x + 5$.
4. The variable terms match, so the missing constant is $k = 5$.

Problem 7

1. Remove the second parentheses with sign 1: $7x - 5 + (-3)x + (9)$.
2. Variable coefficient: $7 + (-3) = 4$.
3. Constant: $-5 + (9) = 4$; result $4x + 4$.
4. The cost at $x = 2$ is $4(2) + (4) = 12$ dollars.

Problem 8

1. Remove the second parentheses with sign -1: $-4x + 6 + (-9)x + (2)$.
2. Variable coefficient: $-4 + (-9) = -13$.
3. Constant: $6 + (2) = 8$; result $-13x + 8$.
4. Numerical check at $x = 2$: both equal $-13(2) + (8) = -18$.

Problem 9

1. Remove the second parentheses with sign 1: $5x - 8 + (-2)x + (3)$.
2. Variable coefficient: $5 + (-2) = 3$.
3. Constant: $-8 + (3) = -5$; result $3x - 5$.
4. At $x = 2$: $3(2) + (-5) = 1$.

Problem 10

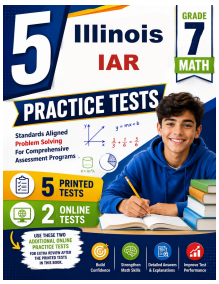
1. Remove the second parentheses with sign -1: $8x + 1 + (5)x + (7)$.
2. Variable coefficient: $8 + (5) = 13$.
3. Constant: $1 + (7) = 8$; result $13x + 8$.

TESTINAR

Keep Building Grade 7 Math Skills

Choose the practice book matched to your state assessment and turn worksheet practice into a complete test-prep plan.

All Grade 7 books



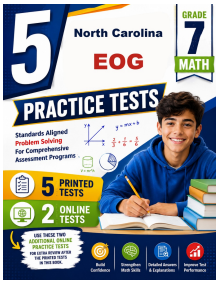
ILLINOIS IAR

5 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook



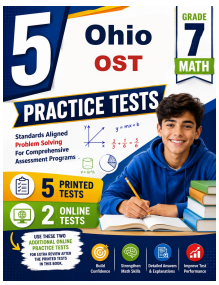
NORTH CAROLINA EOG

5 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook



OHIO OST

5 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook

Need a different state?
Testinar has Grade 7 math practice books for state assessments across the country.

TESTINAR.COM/GRADES/7