

Rewriting Linear Expressions in Equivalent Forms

Grade 7 math · Worksheet · Standards: 7.EE.A.1, 7.EE.A.2

Name: _____ Date: _____ Class: _____

These problems train standards 7.EE.A.1 and 7.EE.A.2: adding, subtracting, factoring and expanding linear expressions with rational coefficients. Early problems drill the distributive property and like terms, while later ones factor, use fractions and decimals, and rewrite percent changes.

Write every sign carefully, and use a test value to check any answer that feels uncertain. The final six problems place the algebra inside gardens, prices, fundraisers and trails.

Standards: 7.EE.A.1, 7.EE.A.2 · **Level:** Grade 7

Problem 1 Combine Three Like Terms (easy)

Simplify $9y + 4y - 3y$.

Problem 2 Expand a Sum (easy)

Expand $6(x + 7)$.

Problem 3 Expand a Difference (easy)

Expand $5(2a - 3)$.

Problem 4 Test for Equivalence (easy)

Jaylen claims that $7(x + 2)$ equals $7x + 2$. Fill in every blank of the table to test his claim, then say whether he is right and give the correct expansion.

x	0	1	2	3
$7(x + 2)$				
$7x + 2$				

Blank table of values.

Problem 5 Expand with a Negative Factor (medium)

Expand $-3(4x - 5)$.

Problem 6 Combine Terms in Four Pieces (medium)

Simplify $8x - 3 + 2x + 11 - 5x$.

Problem 7 Expand with a Fraction (medium)

Expand $\frac{3}{4}(8x - 12)$.

Problem 8 Expand with a Decimal (medium)

Expand $-0.5(6x + 9.2)$.

Problem 9 Factor from an Area Model (medium)

A rectangle is split into two parts with areas $18x$ and 24 , as shown. Find the greatest common factor and write $18x + 24$ in factored form.



Area $18x + 24$.

Problem 10 Factor with a Negative GCF (medium)

Factor $-8x - 20$ so that the first term inside the parentheses is positive.

Problem 11 Subtract an Expression (medium)

Simplify $(3x + 2) - (5x - 7)$.

Problem 12 Add Fractional Coefficients (medium)

Simplify $(\frac{2}{3}x + \frac{1}{4}) + (\frac{1}{3}x - \frac{3}{4})$.

Problem 13 Two Distributions Then Combine (hard)

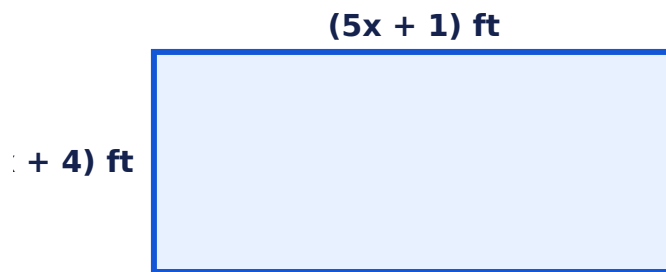
Simplify $4(2x - 3) + 6(x + 1.5)$.

Problem 14 Factor a Decimal Expression (hard)

Write $1.5x - 4.5$ as 1.5 times a binomial.

Problem 15 Perimeter of a Garden (medium)

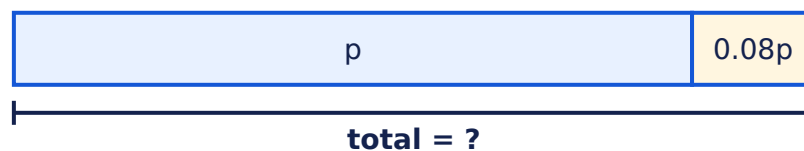
A herb bed measures $(5x + 1)$ feet by $(2x + 4)$ feet. Write a simplified expression for the fencing needed around it, then find the length of fencing when $x = 2$.



Garden dimensions.

Problem 16 Price with Sales Tax (medium)

A jacket costs p dollars before 8% sales tax. Write the total cost as a single product, then find the total for a \$45 jacket.



Price plus tax.

Problem 17 Clearance Discount (medium)

A skateboard has a regular price of p dollars and is marked 35% off. Write the sale price as one product, then find the sale price when the regular price is \$80.

Problem 18 Fundraiser Revenue (hard)

A club sells shirts for x dollars each and hats for $(x - 4)$ dollars each. It sells 15 shirts and 25 hats. Write and simplify an expression for the total revenue. Then find the revenue when $x = 18$.

Problem 19 Find the Error (hard)

Two students simplified $3(2x - 4) - 2(x - 5)$. Ines wrote $4x - 2$ and Cal wrote $4x - 22$. Decide who is correct, check with $x = 3$, and describe the other student's error.

Problem 20 Three Trail Sections (hard)

A hiking trail has three sections. Section 1 is $(2x + 1.5)$ miles. Section 2 is $\frac{3}{4}$ as long as section 1. Section 3 is $(x - 0.25)$ miles shorter than section 1. Write a simplified expression for the whole trail, then find its length when $x = 2$.