

Expression Power Moves

Use operation properties to simplify, expand, and factor.

GRADE 7 • 7.PAR.2.1

7.PAR.2.1 "Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients."

NAME _____

DATE _____

USE PROPERTIES WISELY

Use the distributive property to multiply a factor by every term inside parentheses. Combine like terms only when their variable parts match, and factor by reversing the distributive property.

WORKED EXAMPLE

Simplify: $\frac{7}{5}(x + 10) - \frac{3}{5}x$

1. Distribute: $\frac{7}{5}(x + 10) = \frac{7}{5}x + 14$.

2. Rewrite: $\frac{7}{5}x + 14 - \frac{3}{5}x$.

3. Combine x-terms: $(\frac{7}{5} - \frac{3}{5})x = \frac{4}{5}x$.

Answer: $\frac{4}{5}x + 14$

PRACTICE 6 problems

1 Simplify: $\frac{1}{2}x + 6x - \frac{1}{2}x + 8$

ANSWER _____

2 Simplify: $\frac{11}{12}x - \frac{1}{6}x + 9$

ANSWER _____

3 Expand and simplify: $\frac{2}{9}(18x + 27)$

ANSWER _____

4 Factor completely: $8x + 12$

ANSWER _____

5 Simplify: $(\frac{13}{8}x + 11) - (\frac{1}{8}x - 6)$

ANSWER _____

6 Factor completely: $\frac{9}{2}x - 6$

ANSWER _____

APPLY IT Show your work

- 1** For a school gaming tournament, a club's first supply order costs $\frac{1}{2}x + 16$ dollars. A second order costs $\frac{1}{8}x - 2$ dollars, where x is the number of teams. Write and simplify an expression for both orders together.

WORK SPACE

ANSWER _____

- 2** A headphone bundle is priced at $\frac{11}{12}x + 18$ dollars, where x is the price of a music player in dollars. A coupon reduces the price by $\frac{1}{6}x + 6$ dollars. Write and simplify the final price.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Simplify: $\frac{11}{6}(12x - 9) - \frac{1}{2}(8x + 16)$

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Simplify: $\frac{1}{2}x + 6x - \frac{1}{2}x + 8$	$6x + 8$
2	Simplify: $\frac{11}{12}x - \frac{1}{6}x + 9$	$\frac{3}{4}x + 9$
3	Expand and simplify: $\frac{2}{9}(18x + 27)$	$4x + 6$
4	Factor completely: $8x + 12$	$4(2x + 3)$
5	Simplify: $(\frac{13}{8}x + 11) - (\frac{1}{8}x - 6)$	$\frac{3}{2}x + 17$
6	Factor completely: $\frac{9}{2}x - 6$	$\frac{3}{2}(3x - 4)$

PART 2 • APPLY IT

- $\frac{5}{8}x + 14$ dollars** Add the x-terms and add the constants: $\frac{1}{2}x + \frac{1}{8}x + 16 - 2$. The total is $\frac{5}{8}x + 14$ dollars.
- $\frac{3}{4}x + 12$ dollars** Subtract the coupon expression from the bundle price. Combine $\frac{11}{12}x - \frac{1}{6}x$ and $18 - 6$ to get $\frac{3}{4}x + 12$ dollars.

CHALLENGE

 $18x - \frac{49}{2}$

Accept equivalent simplified expressions with terms in a different order. For factoring items, accept equivalent factored forms, including forms with a negative factor distributed correctly.