

Expression Power Lab

Simplify, model, and evaluate expressions.

GRADE 7 • 7.PFA.2

7.PFA.2 "The student will simplify numerical expressions, simplify and generate equivalent algebraic expressions in one variable, and evaluate algebraic expressions for given replacement values of the variables..."

NAME _____

DATE _____

THE BIG IDEA

Use the order of operations when an expression has grouping symbols, powers, multiplication, and addition or subtraction. To simplify an algebraic expression, distribute when needed, then combine like terms. Like terms have the same variable part.

WORKED EXAMPLE

Simplify: $5(x - 3) + 2x$

1. Distribute 5: $5(x - 3) + 2x = 5x - 15 + 2x$
2. Combine the x-terms: $5x + 2x = 7x$
3. Write the simplified expression: $7x - 15$

Answer: $7x - 15$

PRACTICE 6 problems

1 1. Simplify: $14 - [9 - 8] \cdot 6$

ANSWER _____

2 2. Simplify: $|-11| + \sqrt{81} - 4$

ANSWER _____

3 3. Simplify: $8x - 13 + 9x + 14$

ANSWER _____

4 4. Simplify: $-9(x - 8) + 13x$

ANSWER _____

5 5. If $x = -4$, evaluate: $x^4 + 10x - 9$

ANSWER _____

6 6. An algebra-tile model has 11 positive x-tiles, 4 negative x-tiles, 17 positive unit tiles, and 8 negative unit tiles. Write the simplified expression.

ANSWER _____

APPLY IT Show your work

- 1** 1. A gaming club earns 14 points for each tournament win and loses 8 points for each late check-in. The club has 9 wins and 7 late check-ins. What is the club's total point change?

WORK SPACE

ANSWER _____

- 2** 2. Maya sells digital designs online for \$1.75 each. The website charges her a \$6.25 fee. Write an expression for her profit after selling x designs, then find her profit when $x = 16$.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Are $6x - 11 + 4(x + 9)$ and $10x + 25$ equivalent expressions? Explain your reasoning by simplifying the first expression.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	1. Simplify: $14 - [9 - 8] \cdot 6$	8
2	2. Simplify: $ -11 + \sqrt{81} - 4$	16
3	3. Simplify: $8x - 13 + 9x + 14$	$17x + 1$
4	4. Simplify: $-9(x - 8) + 13x$	$4x + 72$
5	5. If $x = -4$, evaluate: $x^4 + 10x - 9$	207
6	6. An algebra-tile model has 11 positive x-tiles, 4 negative x-tiles, 17 positive unit tiles, and 8 negative unit tiles. Write the simplified expression.	$7x + 9$

PART 2 • APPLY IT

1. **70 points** Write $14(9) - 8(7)$. The club earns 126 points and loses 56 points, for a change of 70 points.
2. **$1.75x - 6.25$; \$21.75** The profit expression is $1.75x - 6.25$. Substitute 16: $1.75(16) - 6.25 = 21.75$.

CHALLENGE

Yes. $6x - 11 + 4(x + 9) = 6x - 11 + 4x + 36 = 10x + 25$, so the expressions are equivalent.

Accept equivalent expressions with terms written in a different order. For the digital-design problem, accept $7/4x - 25/4$ as an equivalent expression.