LESSON MAKER PRO

Plug It In

Simplify expressions and find their values.

GRADE 8 · PA.A.3.1

PA.A.3.1 "Use substitution to simplify and evaluate algebraic expressions."

NAME _____ DATE _____

SUBSTITUTE AND EVALUATE

Replace x with its given value. Put a negative value in parentheses, then use the order of operations. If you are asked to simplify first, combine like terms before substituting.

WORKED EXAMPLE

Evaluate $4(x - 9) + 6$ when $x = 11$.

1. Substitute 11 for x: 4(11 - 9) + 6
2. Subtract inside the parentheses: 4(2) + 6
3. Multiply, then add: 8 + 6 = 14

Answer: 14

PRACTICE 6 problems

1 Evaluate $2x + 7$ when $x = 5$.

ANSWER _____

2 Evaluate $x^2 + 8$ when $x = -3$.

ANSWER _____

3 Evaluate $5x - 8$ when $x = -2$.

ANSWER _____

4 Evaluate $8x + 5$ when $x = 1/2$.

ANSWER _____

5 Simplify $3x + 2(x - 1)$, then evaluate it when $x = -5$.

ANSWER _____

6 Evaluate $2x^2 - 3(x - 5)$ when $x = -1$.

ANSWER _____

APPLY IT Show your work

1 A streaming service charges $8 per month plus $2 for each movie you rent. Write an expression for the monthly cost if you rent x movies. Then find the cost for 5 movies.

WORK SPACE

ANSWER _____

2 Tickets to a school dance cost $x each. An online seller also charges a $2 fee for each ticket. Write an expression for the total cost of 3 tickets. Then find the cost when x = 8.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Maya says $3x^2$ and $(3x)^2$ have the same value when x = -2. Evaluate both expressions. Then explain in one sentence why their values differ.

WORK SPACE AND ANSWER

ANSWER KEY

Plug It In

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Evaluate 2x + 7 when x = 5.	**17**
2	Evaluate x^2 + 8 when x = -3.	**17**
3	Evaluate 5x - 8 when x = -2.	**-18**
4	Evaluate 8x + 5 when x = 1/2.	**9**
5	Simplify 3x + 2(x - 1), then evaluate it when x = -5.	**5x - 2; -27**
6	Evaluate $2x^2$ - 3(x - 5) when x = -1.	**20**

PART 2 · APPLY IT

1. **8 + 2x; $18** Substitute 5 for x: 8 + 2(5) = 18.
2. **3(x + 2); $30** Each ticket costs x + 2 dollars. Substitute 8: 3(8 + 2) = 30.

CHALLENGE

$3x^2 = 12$; $(3x)^2 = 36$. In the first expression, only x is squared, but in the second, the entire product is squared.

Accept equivalent simplified expressions in the word problems. For the challenge, accept any one-sentence explanation that correctly identifies what is squared in each expression.