LESSON MAKER PRO

Expression Detective

Rewrite expressions to reveal equal groups and total parts.

GRADE 7 · NY-7.EE.2

NY-7.EE.2 "Understand that rewriting an expression in different forms in real-world and mathematical problems can reveal and explain how the quantities are related."

NAME _____ DATE _____

SEE BOTH FORMS

Use the distributive property to move between a factored form and an expanded form. A factored form can show equal groups, while an expanded form can show the total from each part.

WORKED EXAMPLE

Rewrite 7(x + 5) in expanded form.

1. Start with 7(x + 5).
2. Multiply 7 by x to get 7x.
3. Multiply 7 by 5 to get 35.
4. Write the sum: 7x + 35.

Answer: 7x + 35

PRACTICE 6 problems

1 Rewrite 4(x + 6) in expanded form.

ANSWER _____

2 Factor 8x + 24 by using the greatest common factor.

ANSWER _____

3 Rewrite 6(2x + 3) in expanded form.

ANSWER _____

4 Factor 18x + 24 by using the greatest common factor.

ANSWER _____

5 A club orders 3 identical sticker packs. Each pack contains x regular stickers and 9 bonus stickers. The total is 3(x + 9). Rewrite the expression in expanded form. What does 27 represent?

ANSWER _____

6 Compare 11(x + 2) and 11x + 22. Which form best shows 11 equal groups? What does 22 represent in the expanded form?

ANSWER _____

APPLY IT Show your work

1 A phone-case shop charges x dollars for one printed design and $10 for one phone case. Lee buys 2 phone cases, and each case has one printed design. The cost is modeled by 2(x + 10). Rewrite the expression in expanded form. Explain what each term means.

WORK SPACE

ANSWER _____

2 A class of 9 students visits a museum. Admission costs x dollars per student. The class also pays a $27 guide fee. The total cost is 9x + 27. Rewrite the expression to show the cost per student if the guide fee is shared equally. Explain what the 3 means.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A streaming club has 16 members. Each member pays x dollars for a monthly subscription. The club also spends $48 on a shared online event. The treasurer writes 16x + 48. Rewrite the expression to show the equal cost per member, and explain what the expression inside the parentheses means.

WORK SPACE AND ANSWER

ANSWER KEY

Expression Detective

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Rewrite 4(x + 6) in expanded form.	**4x + 24**
2	Factor 8x + 24 by using the greatest common factor.	**8(x + 3)**
3	Rewrite 6(2x + 3) in expanded form.	**12x + 18**
4	Factor 18x + 24 by using the greatest common factor.	**6(3x + 4)**
5	A club orders 3 identical sticker packs. Each pack contains x regular stickers and 9 bonus stickers. The total is 3(x + 9). Rewrite the expression in expanded form. What does 27 represent?	**3x + 27; 27 is the total number of bonus stickers in all 3 packs.**
6	Compare 11(x + 2) and 11x + 22. Which form best shows 11 equal groups? What does 22 represent in the expanded form?	**11(x + 2); 22 is the total of 2 from each of the 11 groups.**

PART 2 · APPLY IT

1. **2x + 20; 2x is the cost of the two printed designs, and 20 is the cost of the two phone cases.** Distribute 2 to both terms inside the parentheses. The $10 amount is paid for each of the 2 phone cases.
2. **9(x + 3); 3 is each student's share of the $27 guide fee.** Factor out 9 from 9x + 27. Since 27 divided by 9 is 3, each student pays admission plus a $3 share of the guide fee.

CHALLENGE

16(x + 3); x + 3 means each member's subscription cost plus that member's $3 share of the online event.

Accept equivalent expressions written in a different order, such as 24 + 4x. For explanations, students should connect a factored form to equal groups and an expanded form to the totals from the parts.