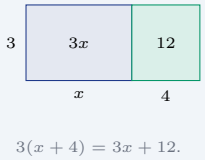
The Distributive Property

Name: _____	Date: _____	Score: _____ / 18

Quick Review and Helpful Hints

The distributive property says $a(b + c) = ab + ac$: multiply the factor outside the parentheses by *each* term inside, then combine. It works with subtraction too: $a(b - c) = ab - ac$. A negative factor in front flips the sign of every term inside.

▷ **Example:** Expand $3(x + 4)$. **Work:** Multiply the 3 by each term inside: $3 \cdot x = 3x$ and $3 \cdot 4 = 12$. Then write them as a sum.
★ **Answer:** $3x + 12$



$3(x + 4) = 3x + 12.$

Practice Problems

Expand and simplify each expression.

1. $2(x + 5)$ _____

2. $4(x - 3)$ _____

3. $5(2x + 1)$ _____

4. $3(a - 2)$ _____

5. $-2(x + 4)$ _____

6. $6(x + 2)$ _____

7. $-3(2x - 1)$ _____

8. $7(x - 5)$ _____

9. $2(3a + 4)$ _____

10. $-(x + 6)$ _____

11. $4(2x + 3y)$ _____

12. $5(x - 1) + 2$ _____

13. $-4(2 - x)$ _____

14. $3(x + 2) + 4x$ _____

Word Problems

15. A garden has 4 rows, and each row has $(x + 3)$ plants. Write and simplify the total number of plants.

_____

16. A rectangle is 5 units tall and $(2x + 1)$ units wide. Write a simplified expression for its area.

_____

17. Each gift bag holds $(x - 2)$ candies. Write and simplify the total for 6 bags.

_____

18. For a school fundraiser, one table packs 2 boxes with $(x + 5)$ flyers each and another packs 3 boxes with $(x - 1)$ flyers each. Write a simplified expression for the total flyers.

_____

Answer Keys

1. $2x + 10$	**7.** $-6x + 3$	**13.** $4x - 8$
2. $4x - 12$	**8.** $7x - 35$	**14.** $7x + 6$
3. $10x + 5$	**9.** $6a + 8$	**15.** $4x + 12$
4. $3a - 6$	**10.** $-x - 6$	**16.** $10x + 5$
5. $-2x - 8$	**11.** $8x + 12y$	**17.** $6x - 12$
6. $6x + 12$	**12.** $5x - 3$	**18.** $5x + 7$

Step-by-Step Explanations

1. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply the 2 by each term inside the parentheses: $2 \cdot x = 2x$ and $2 \cdot 5 = 10$. Write them as a sum: $2x + 10$. So the final answer is $2x + 10$.

2. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute the 4: $4 \cdot x = 4x$ and $4 \cdot 3 = 12$. Keep the subtraction: $4x - 12$. So the final answer is $4x - 12$.

3. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply the 5 by each term: $5 \cdot 2x = 10x$ and $5 \cdot 1 = 5$, giving $10x + 5$. So the final answer is $10x + 5$.

4. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute the 3: $3 \cdot a = 3a$ and $3 \cdot 2 = 6$, so $3a - 6$. So the final answer is $3a - 6$.

5. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A negative factor flips each sign inside: $-2 \cdot x = -2x$ and $-2 \cdot 4 = -8$, giving $-2x - 8$. So the final answer is $-2x - 8$.

6. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply the 6 by each term: $6 \cdot x = 6x$ and $6 \cdot 2 = 12$, so $6x + 12$. So the final answer is $6x + 12$.

7. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute -3: $-3 \cdot 2x = -6x$ and $-3 \cdot (-1) = +3$, giving $-6x + 3$. So the final answer is $-6x + 3$.

8. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply the 7 by each term: $7 \cdot x = 7x$ and $7 \cdot 5 = 35$, so $7x - 35$. So the final answer is $7x - 35$.

9. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute the 2: $2 \cdot 3a = 6a$ and $2 \cdot 4 = 8$, giving $6a + 8$. So the final answer is $6a + 8$.

10. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The -1 in front flips both signs: $-x - 6$. So the final answer is $-x - 6$.

11. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply the 4 by each term: $4 \cdot 2x = 8x$ and $4 \cdot 3y = 12y$, giving $8x + 12y$. So the final answer is $8x + 12y$.

12. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is First distribute: $5 \cdot x - 5 \cdot 1 = 5x - 5$. Then combine the numbers: $-5 + 2 = -3$, giving $5x - 3$. So the final answer is $5x - 3$.

13. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute -4: $-4 \cdot 2 = -8$ and $-4 \cdot (-x) = +4x$. Written in order: $4x - 8$. So the final answer is $4x - 8$.

14. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute the 3: $3x + 6$. Then add the $4x$: $3x + 4x = 7x$, giving $7x + 6$. So the final answer is $7x + 6$.

15. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Each of the 4 rows has $(x + 3)$ plants, so the total is $4(x + 3) = 4x + 12$ plants. So the final answer is $4x + 12$.

16. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Area is height times width: $5(2x + 1) = 5 \cdot 2x + 5 \cdot 1 = 10x + 5$. So the final answer is $10x + 5$.

17. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Six bags each hold $(x - 2)$ candies: $6(x - 2) = 6x - 12$. So the final answer is $6x - 12$.

18. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute both groups: $2(x+5) = 2x+10$ and $3(x-1) = 3x-3$. Combine: $2x + 3x = 5x$ and $10 - 3 = 7$, giving $5x + 7$. So the final answer is $5x + 7$.

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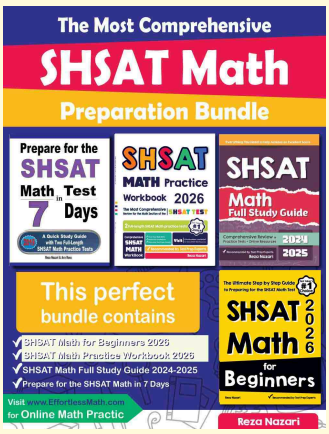

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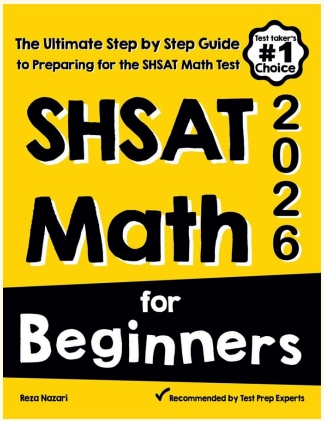

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