Factoring with the Greatest Common Factor

Name: _____	Date: _____	Score: _____ / 18

Quick Review and Helpful Hints

The *GCF* is the largest factor shared by all terms – include common numbers *and* common variables. Factor the GCF out front and write what is left in parentheses. Check by distributing back.

▷ **Example:** Factor $6x + 9$. **Work:** The GCF of 6 and 9 is 3. Divide each term by 3: $3(2x + 3)$. ★ **Answer:** $3(2x + 3)$

$$6x + 9 \xrightarrow{\text{GCF } 3} 3(2x + 3)$$

Pull out the common factor.

Practice Problems

Factor out the greatest common factor.

1. $6x + 9$ _____
2. $4x + 8$ _____
3. $10x - 15$ _____
4. $3x^2 + 6x$ _____
5. $12x - 18$ _____
6. $5x^2 + 10x$ _____
7. $8x + 12$ _____
8. $9x^2 - 3x$ _____
9. $14x + 21$ _____
10. $2x^2 + 8x$ _____
11. $15x - 25$ _____
12. $6x^2 + 9x$ _____
13. $4x^2 - 6x$ _____
14. $20x + 30$ _____

Word Problems

15. A workshop has $8x + 20$ total fasteners grouped into identical packets. Factor the expression to show the common packet size. _____
16. A rectangle's area is $6x^2 + 9x$. Factor it. _____
17. A banner uses $12x^2 - 8x$ square inches of vinyl after trimming. Factor the expression to show the shared strip size. _____
18. A snack table has $7x + 14$ items arranged in equal rows. Factor the expression to show the common row size. _____

Answer Keys

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

Step-by-Step Explanations

1. Start by naming the process: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 3: $3(2x+3)$. So the final answer is $3(2x+3)$.

2. A good way to think about this is: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 4: $4(x+2)$. So the final answer is $4(x+2)$.

3. Step by step: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 5: $5(2x-3)$. So the final answer is $5(2x-3)$.

4. Take it one move at a time: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF $3x$: $3x(x+2)$. So the final answer is $3x(x+2)$.

5. Start by naming the process: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 6: $6(2x-3)$. So the final answer is $6(2x-3)$.

6. A good way to think about this is: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF $5x$: $5x(x+2)$. So the final answer is $5x(x+2)$.

7. Step by step: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 4: $4(2x+3)$. So the final answer is $4(2x+3)$.

8. Take it one move at a time: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF $3x$: $3x(3x-1)$. So the final answer is $3x(3x-1)$.

9. Start by naming the process: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 7: $7(2x+3)$. So the final answer is $7(2x+3)$.

10. A good way to think about this is: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF $2x$: $2x(x+4)$. So the final answer is $2x(x+4)$.

11. Step by step: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 5: $5(3x-5)$. So the final answer is $5(3x-5)$.

12. Take it one move at a time: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF $3x$: $3x(2x+3)$. So the final answer is $3x(2x+3)$.

13. Start by naming the process: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF $2x$: $2x(2x-3)$. So the final answer is $2x(2x-3)$.

14. A good way to think about this is: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 10: $10(2x+3)$. So the final answer is $10(2x+3)$.

15. Step by step: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 4: $4(2x+5)$. So the final answer is $4(2x+5)$.

16. Take it one move at a time: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF $3x$: $3x(2x+3)$. So the final answer is $3x(2x+3)$.

17. Start by naming the process: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF $4x$: $4x(3x-2)$. So the final answer is $4x(3x-2)$.

18. A good way to think about this is: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 7: $7(x+2)$. So the final answer is $7(x+2)$.

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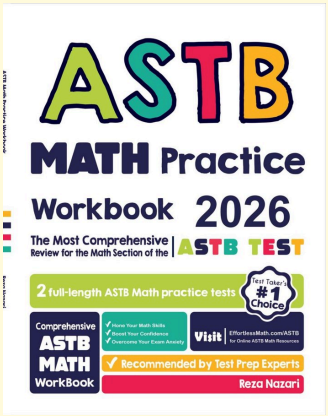

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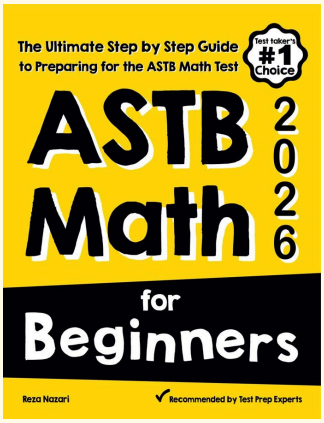

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