

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